COMMERCE DEPARTMENT

Forks-Rost Transmission Line Project Environmental Assessment

The Human and Environmental Impacts of the Forks-Rost 161kV Transmission Line Project

May 2025

Docket Number ET-6675/TL-24-232

Abstract

Responsible Government Unit
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
St. Paul, MN 55101

Commission Representative
Jacques Harvieux
651-201-2233
Jacques.Harvieux@state.mn.us

Preparer
Minnesota Department of Commerce
85 7th Place East, Suite 280
Saint Paul, MN 55101

Commerce Representative
Larry Hartman
651-539-1839
larry.hartman@state.mn.us

Applicant
ITC Midwest LLC
20789 780th Ave
Albert Lea, MN 56007

Applicant Representative
Mark Rothfork
319-297-6700
mrothfork@itctransco.com

ITC Midwest LLC (applicant) proposes to construct a 161 kilovolt (kV) transmission line from the new Forks Switching Station to the new Rost Substation in Jackson County, Minnesota (Forks-Rost Transmission Line Project or project). The project includes construction of the new Forks Switching Station and approximately 8.5 miles of 161 kV high voltage transmission line from the Forks Switching Station to the new Rost Substation; this new substation will be permitted and constructed as a separate project by Great River Energy.

The Forks-Rost Transmission Line Project requires a route permit from the Minnesota Public Utilities Commission (Commission). The applicant submitted a route permit application to the Commission on September 30, 2024. Department of Commerce (Department) Energy Environmental Review and Analysis (EERA) staff have prepared this environmental assessment (EA) for the project.

This EA addresses the issues and mitigation measures identified in the Department's scoping decision of February 10, 2025. It evaluates the project's potential for human and environmental impacts and possible measures to mitigate these impacts.

Public hearings for the project will be held in the project area and are anticipated to occur the week of May 13, 2025. Notice of the hearings will be issued separately. An administrative law judge (ALJ) from the Minnesota Office of Administrative Hearings will preside over the hearings. Upon completion of the hearings, the ALJ will submit a report to the Commission including recommendations to the Commission regarding the applicant's route permit application. Commission decisions on a route permit are expected in the fourth quarter of 2025.

Additional materials related to this project and its permitting proceedings are available on the Department's website: http://mn.gov/commerce/energyfacilities and on the state of Minnesota's eDockets system: https://www.edockets.state.mn.us (enter the year "24" and the number "232").

Persons interested in receiving future project notices and updates can place their names on the project mailing list by emailing docketing.puc@state.mn.us or calling 651-201-2246 and providing the docket number (24-232), their name, email address, and mailing address. Please indicate how you would like to receive notices—by email or U.S. mail.

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List of Preparers

Minnesota Department of Commerce
Energy Environmental Review and Analysis
Larry Hartman and Ray Kirsch

Barr Engineering Co.

Environmental Assessment
Forks-Rost Transmission Line Project

May 2025

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Acronyms

ALJ	administrative law judge
Applicant	ITC Midwest LLC
AQI	Air Quality Index
BGEPA	Bald and Golden Eagle Protection Act
BMP(s)	best management practices
BWSR	Minnesota Board of Water and Soil Resources
CO_2	carbon dioxide
Commission	Minnesota Public Utilities Commission
dBA	A-weighted decibel
Department	Department of Commerce
DNR	Minnesota Department of Natural Resources
EA	environmental assessment
EERA	Energy Environmental Review and Analysis
EJ	Environmental justice
EJC	Environmental Justice Communities
EMF	electromagnetic fields
FAA	Federal Aviation Administration
GHGs	Greenhouse gases
GPS	global position systems
ICD	implantable cardioverter defibrillators
IPaC	Information for Planning and Consultation
kV	kilovolt
LGU(s)	local units of government
MBTA	Migratory Bird Treaty Act
MDA	Minnesota Department of Agriculture
MEPA	Minnesota Environmental Policy Act
Merjent	Merjent, Inc
mG	milliGauss
MnDOT	Minnesota Department of Transportation
MnSHIP	Minnesota's Statewide Historic Inventory Portal
MWI	Minnesota Well Index
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NERC	Electric Reliability Corporation
NESC	National Electrical Safety Code
NO_2	nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NRHP	National Register of Historic Places
O_3	ozone
OSA	Office of the State Archaeologist
PSA(s)	Primary Service Areas
PWI	public waters inventory
ROW	right-of-way
SDS	State Disposal System

SHPO	State Historic Preservation Office
SO_2	sulfur dioxide
SSP	Shared Socioeconomic Pathway
USACE	United States Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WCA	Wetland Conservation Act

Summary

This environmental assessment (EA) has been prepared for the Forks-Rost 161 kilovolt (kV) transmission line project (the project), a 161 kV transmission line proposed by ITC Midwest LLC (applicant). This EA evaluates potential human and environmental impacts of the project and possible mitigation measures.

This EA is not a decision-making document but rather a guide for decision-makers. The EA is intended to facilitate informed decisions by state agencies, particularly with respect to the goals of the Minnesota Environmental Policy Act (MEPA) — "to create and maintain conditions under which human beings and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of the state's people" (Minn. Statute 116D.02).

Electrical Transmission System Reliability and the Shift to Renewable Energy

Over the past few decades, the generation of electricity in Minnesota has evolved away from fossil-fueled baseload generating plants to renewable generating resources (e.g., wind and solar power). In 2011, over half of the electricity generated in Minnesota came from coal-fired electric power plants. In 2023, these plants produced only 22 percent of the electricity in Minnesota, while renewable generating resources provided 33 percent (reference (1)). This change in electrical generation has implications for the current transmission system and whether the current system can handle the increased energy that these renewable energy projects generate.

The Forks Rost Project

The project includes constructing 8.5 miles of 161 kV transmission line in Ewington and Rost Townships, Jackson County, Minnesota. The project will start at the proposed new Rost Substation, near the intersection of County Road 5 and 790th Street. Great River Energy has permitted and constructed the Rost Substation for this project. The project will run south from the Rost substation along County Road 5 until turning east on 780th Street. It will run east for one mile until reaching 360th Avenue and then turn south for another mile. Then the line will turn east on 770th Street for 5.5 miles until connecting to the new Forks Switching Station, which will be constructed, owned, and operated by the applicant as part of this project (Map 1-1).

The project requires a right-of-way (ROW) of 100 feet, with 50 feet on either side of the transmission line's centerline. Where the project follows existing road ROW, transmission line structures will be placed approximately 5 to 8 feet outside the road ROW.

The State of Minnesota's Role

The project requires a route permit from the Minnesota Public Utilities Commission (Commission) and approvals from other state and federal agencies with permitting authority for specific resources. For the Forks-Rost 161kV Transmission Line Project, the Commission must determine how best to mitigate potential impacts of the project.

To help the Commission with its decision-making and to provide a fair and thorough airing of the issues, the state of Minnesota has set out a process for the Commission to follow in making its decisions. This

process requires (1) the development of an EA and (2) public hearings before an administrative law judge (ALJ) (Minn. Statutes 216B and 216E). The goal of the EA is to describe the potential human and environmental impacts of the project ("the facts"); the goal of the hearings is to advocate, question, and debate what the Commission should decide about the project ("what the facts mean"). The entire record developed in this process, including all public input and testimony, is considered by the Commission when it makes its decision on the applicant's route permit application.

Commission Decision Criteria

The Commission makes its decision on the applicant's route permit application through criteria set out in Minnesota statutes and rules. For a route permit, the Commission is charged with selecting transmission line routes that minimize adverse human and environmental impacts while providing continuing electric power system reliability and integrity. Per Minn. Rule 7850.4100, the Commission must consider 14 factors when making a route permit decision:

A. Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.

B. Effects on public health and safety.

C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.

D. Effects on archaeological and historic resources.

E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.

F. Effects on rare and unique natural resources.

G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity.

H. Use or paralleling of existing ROW, survey lines, natural division lines, and agricultural field boundaries.

I. Use of existing large electric power generating plant sites.

J. Use of existing transportation, pipeline, and electrical transmission systems or ROWs.

K. Electrical systems reliability.

L. Costs of constructing, operating, and maintaining the facility, which are dependent on design and route.

M. Adverse human and natural environmental effects which cannot be avoided.

N. Irreversible and irretrievable commitments of resources.

Environmental Assessment

MEPA requires that environmental review be conducted for major governmental actions with the potential to create significant environmental impacts (Minn. Statute 116D.04). To meet this requirement, the Commission has authorized the preparation of an EA. Department of Commerce (Department) Energy Environmental Review and Analysis (EERA) staff is responsible for preparing the EA on behalf of the Commission.

This EA is intended to facilitate informed decision-making by the Commission and other entities with regulatory authority over the project. It also assists citizens in providing guidance to decision-makers regarding the project. This EA analyzes the potential human and environmental impacts of the project and possible mitigation measures. The EA does not advocate or state a preference for a specific alternative. Instead, it analyzes and compares alternatives so that citizens, agencies, and governments can work from a common set of facts.

Public Participation

In preparing this EA, EERA staff solicited public comments on (1) the human and environmental impacts that should be evaluated in the EA, and (2) possible mitigation measures to study. This process of soliciting comments on the contents of the EA is known as “scoping.” EERA staff solicited comments through public meetings in December 2024 and through a comment period that ended on December 24, 2024. Based on the public comments received and after review by the Commission, the Department issued the scoping decision for this EA on February 10, 2025.

Human and Environmental Impacts of the Project

Project construction and operation will impact human and environmental resources within the designated project area. Some impacts will be short-term and similar to those of any large construction project (e.g., noise, dust, soil disturbance). These impacts can be mitigated by measures common to most construction projects.

Other impacts will exist for the life of the project and may include aesthetic impacts, impacts on land-based economies such as agriculture, as well as impacts to the natural environment and on rare and unique natural resources. These long-term impacts are generally not well mitigated by construction measures. That is, these impacts do not flow from how the project is constructed but rather through its design and location. Long-term impacts can be somewhat mitigated by prudent design for the project.

Many impacts are anticipated to be minimal—in and of themselves or with common mitigation measures—for the project. These include:

A. Impacts on human settlements (factor A) – displacement, environmental justice communities, noise, property values, electronic interference, cultural values, zoning and land-use compatibility, and public services.

B. Impacts on public health and safety (factor B) – EMF, implantable medical devices, stray voltage, induced voltage, and air quality.

C. Impacts on land-based economies (factor C) – forestry, mining, and recreation and tourism.

D. Impacts on archaeological and historic resources (factor D).

E. Impacts on rare and unique natural resources (factor F) – federal- and state-protected species.

F. Impacts on electric system reliability (factor K).

G. Costs that are dependent on design and route (factor L).

Use or paralleling of existing rights-of-way (factors H and J).

However, other aspects may have more moderate impacts:

Impacts on human settlements (factor A) – aesthetics.

Impacts on land-based economies (factor C) – agriculture

Impacts on the natural environment (factor E) – water resources, vegetation (flora), and wildlife (fauna).

Impacts on rare and unique natural resources (factor F) – sensitive ecological resources.

Potential human and environmental impacts are summarized in Table S-1 and discussed further below.

Table S-1 Human and Environmental Impacts for the Applicant's Proposed Route

Resource	Element	Applicant's Proposed Route
Length (miles)		8.5
Human Settlement	Residences within 0-50 feet (count)	0
	Residences within 50-250 feet (count)	4
	Residences within 250-500 feet (count)	2
	Residences within 500-1,000 feet (count)	3
Environmental Justice	Communities of EJ concern crossed by the 100-ft ROW (count)	0
Land-Based Economies	Agricultural land in 100-ft ROW (acres) and Forks Switching Station	67
Archaeological and Historic Resources	Archaeological sites in route width (count)	0
	Historic resources in route width (count)	1 (not eligible)
Water Resources	Stream crossings (count)	3
	PWI crossings (count)	2
	Desktop delineated wetland crossings (count)	9
	Total desktop delineated wetlands in 100-foot ROW (acres)	11.1
Vegetation	Forested landcover in 100-foot ROW (acres)	0
Wildlife	Wildlife Management Areas in 100-foot ROW (acres)	0
	Scientific and Natural Areas in 100-foot ROW (acres)	0
	Potential for Federal- or state-protected species in 100-foot ROW (count)	2
ROW Sharing and Paralleling	Transmission line (miles, percent)	0.86 (10)
	Roadway (miles, percent)	8.5 (100)
	Field, parcel, or section lines (miles, percent)	8.5 (100)
	Total ROW sharing and paralleling (miles, percent)	8.5 (100)
Estimated Cost	Total estimated cost (million)	$13.5- $18.8

Human Settlements

Potential project impacts on human settlements are assessed through an evaluation of several elements, including noise, property values, electronic interference, cultural values, zoning and land-use compatibility, and public services. For most of the human settlement elements, project impacts are anticipated to be minimal. Analysis of impacts to human settlements focuses on those elements where impacts have the potential to occur, which for the project includes aesthetics.

Aesthetics

Aesthetic impacts are assessed, in part, through consideration of the existing viewshed, landscape, character, and setting of any given area, followed by an evaluation of how a proposed project will change these aesthetic attributes. Determining the relative scenic value or visual importance in any given area

depends, in large part, on the values and expectations held by individuals and communities about the aesthetic resource in question.

Based on the project's proximity to residences, aesthetic impacts may occur as a result of the project. There are four residences located between 50 and 250 feet of the applicant's proposed route. The project will result in the introduction of new infrastructure in a relatively rural area. However, aesthetic impacts will be minimized by sharing existing road ROW. In addition, there is an existing 69 kV transmission line approximately 450 feet away that the project parallels until 780th street, which has a similar visual appearance, albeit on a smaller scale than the project. The applicant has also committed to minimizing permanent impacts on the aesthetics and visual character of the area by avoiding and/or minimizing tree clearing and avoiding residential areas to the maximum extent practicable.

Land-Based Economies

Potential impacts to land-based economies are assessed through several elements including agriculture, forestry, mining, and recreation and tourism resources. The majority of elements considered under land-based economies would be minimally impacted by the project; only agricultural impacts are discussed further.

Agriculture

According to the NLCD, there are 55.5 acres of agricultural land within the ROW. This agricultural land is comprised of hay/pastureland and cultivated crop land and equates to 54.4 percent of the total land cover within the ROW. In addition, there are 11.8 acres of agricultural land within the Forks Switching Station siting area. Permanent impacts to agriculture as a result of the project will include loss of farmland due to the Forks Switching Station and structure placement in agricultural fields, which can restrict certain types of farming equipment. Impacts to agricultural operations have been mitigated by proposing a project that primarily follows existing road ROW. Additionally, the applicant will work with landowners regarding compensation for any unintended impacts (e.g., repair of drain tile).

Natural Environment

Potential impacts to the natural environment are assessed by looking at several specific elements. For some of the elements of the natural environment, impacts from the project are anticipated to be minimal and are therefore not discussed here further. This section addresses those elements that do have the potential to be impacted by the project – water resources, vegetation, and wildlife.

Water Resources

The project crosses two streams that are identified as public waters – Judicial Ditch 28 and the Little Sioux River– as well as one non-public water stream. In addition, nine wetlands totaling approximately 11.1 acres are located in the project ROW. However, it is anticipated that impacts on water courses and wetlands will be avoided by adjusting structure locations to avoid disturbing the streams and wetlands. No stream or wetland crossing would be greater than 1,000 feet, meaning all stream crossings can be spanned to avoid placing a structure within these resources. In addition, the project will develop a SWPPP that identifies BMPs to be implemented during construction to minimize erosion and sedimentation impacts to surface waters. The applicant will also work with the Minnesota Department of Natural Resources (DNR) to obtain appropriate approvals for public water crossings.

Vegetation

Present-day vegetation consists of herbaceous agricultural vegetation, cultivated crops, hay and pasture land, and developed lands. Project construction will result in short-term impacts on existing vegetation, including localized physical disturbance and soil compaction. Development and use of access roads, staging, and stringing areas for the project will also have short-term impacts on vegetation by concentrating surface disturbance and equipment use. Permanent vegetation clearing would be required in the designated structure installation areas, resulting in an impact area measuring up to 5 feet in diameter for typical structures and up to 12 feet in diameter for dead-end and angle structures. The trees and understory brush would be cleared for installation of structures and where canopy heights would interfere with the project. Construction will also result in long-term impacts to vegetation by permanently removing taller-growing woody vegetation within the ROW.

Mitigation will include following existing road ROW, limiting new access road construction, constructing during fall and winter months to limit vegetation damage, leaving or replanting compatible vegetation at the edge of the transmission line ROW, replanting the transmission line ROW outside of active farmed areas with low-growing, native species, and limiting vehicle traffic to roads along the ROW and within previously disturbed areas.

Wildlife

Wildlife in the general vicinity of the project includes songbirds, raptors, and small mammals. In addition, Minnesota is in the Central Flyway of North America. Migratory birds use portions of the Central Flyway as resting grounds during spring and fall migration, as well as breeding and nesting grounds throughout the summer. Within and near the project, there is limited suitable habitat for migratory birds. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA). In addition, bald eagles and golden eagles are protected under the MBTA and the federal Bald and Golden Eagle Protection Act (BGEPA).

For non-avian wildlife, construction activities that generate noise, dust, or disturbance may result in short-term, indirect impacts. During project construction, wildlife will generally be displaced within the ROW. Potential impacts to avian species (e.g., songbirds, raptors, and waterfowl) include displacement during construction, electrocution, and collision with transmission line conductors. Independent of the electrocution risk, birds may be injured by colliding with transmission line structures and conductors. The collision risk is influenced by several factors including habitat, flyways, foraging areas, and bird size.

The primary mitigation strategy is to avoid disturbing and placing structures within riparian areas and wetlands. Bird collisions with transmission lines can be mitigated by configuring the conductors in a single horizontal plane or through the use of bird flight diverters.

Rare and Unique Natural Resources

There are six documented federally listed species within 1 mile of the applicant's proposed route. The northern long-eared bat and tricolored bat, have the potential to be within the 100-foot ROW and, if present, could potentially be directly impacted by the project if trees are removed during the active nesting period. Impacts on northern long-eared bats and tricolored bats could be minimized by conducting tree clearing activities while the bats are hibernating during their inactive season and avoiding tree removal from June 1 through August 15.

Summary of Project-Specific Routing Factors

The discussion here uses text and a color graphic to summarize the relative merits of the applicant's proposed route (Table S-2). The color graphic and related notes for a specific routing factor or element are not meant to suggest that accommodations and/or changes need to be made to the route but are provided as a relative comparison to be evaluated together with all other routing factors. For example, if the applicant's proposed route is "red" for a particular factor or element, this is not meant to indicate a fatal flaw within the proposed route.

For routing factors that express the state of Minnesota's interest in the efficient use of resources (e.g., the use and paralleling of existing rights-of-way), the graphic represents the consistency of the route with these interests. For the remaining routing factors, the graphic represents the magnitude of the anticipated impacts.

Table S-2 Guide to Relative Merits of the Applicant's Proposed Route

Anticipated Impacts or Consistency with Routing Factor	Symbol
Minimal: Impacts are anticipated to be minimal with mitigation – OR – route option is very consistent with this routing factor.	
Moderate: Impacts are anticipated to be minimal to moderate with mitigation; special permit conditions may be required for mitigation – OR – the route may not be the least impactful with respect to the routing factor.	
Significant: Impacts are anticipated to be moderate to significant and likely unable to be mitigated – OR – route alternative is not consistent with the routing factor or consistent only in part. Indicates that the route is impactful with respect to the routing factor.	

A summary of the relative merits of the applicant's proposed route, broken down by each routing factor, is provided in Table S-3.

Table S-3 Summary of Routing Factors for the Applicant's Proposed Route

Routing Factor/Resource	Applicant's Proposed Route	Summary
Human Settlement – Displacement, Noise, Aesthetics, Cultural Values, Recreation, and Public Services		There are four residences located between 50 and 250 feet of the applicant's proposed route. Some tree clearing along the ROW may occur. The project will result in a viewshed change for the area.
Public Health and Safety		No impacts to public health and safety are anticipated as a result of the project.
Land-based Economies – Agriculture, Forestry, Tourism, and Mining		Permanent impacts to agriculture as a result of the project may include loss of farmland due to construction of the Forks Switching Station and structure placement in agricultural fields and restriction of farming equipment. Impacts to agricultural operations have been mitigated by proposing a project that follows existing roadway ROW entirely.
Archaeological and Historic Resources		No impacts to eligible archaeological and historic resources are anticipated as a result of the project.

Routing Factor/Resource	Applicant's Proposed Route	Summary
Natural Environment – Air and Water Quality Resources and Flora and Fauna		Impacts to water courses and wetlands will be avoided by adjusting structure locations to avoid impacting streams and wetlands. Project construction will result in short- and long-term impacts to existing vegetation. Short-term impacts to non-avian wildlife may occur. Avian electrocution and/or collision may occur as a result of the project.
Rare and Unique Natural Resources		The project may result in impacts to northern long eared bats if they are present in the ROW; however, this can be mitigated by conducting clearing activities while the bats are hibernating during their inactive season and avoiding tree removal from June 1 through August 15.
Application of Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and could Accommodate Expansion of Transmission or Generating Capacity		The project has been designed to maximize energy efficiencies and mitigate adverse environmental effects.
Use or Paralleling of Existing Rights-of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries		The project parallels existing road ROW for 100 percent of its length.
Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way		The project parallels existing road ROW for 100 percent of its length.
Electrical System Reliability		The project supports electrical system reliability.
Costs of Construction, Operating, and Maintaining the Facility which are Dependent on Design and Route		The project has been designed to minimize construction and operating costs to the extent possible.
Adverse Human and Natural Environmental Effects which Cannot be Avoided		Unavoidable adverse human and environmental effects have been minimized to the extent possible.
Irreversible and Irretrievable Commitments of Resources		Irreversible and irretrievable commitments of resources have been minimized to the extent possible.

1 Introduction

This EA has been prepared for a new 161 kV transmission line from the new Forks Switching Station to the new Rost Substation in Jackson County, Minnesota, proposed by ITC Midwest LLC (applicant). This EA evaluates the potential human and environmental impacts of the project and possible mitigation measures.

This EA is not a decision-making document, but rather a guide for decision-makers. The EA is intended to facilitate informed decisions by state agencies, particularly with respect to the goals of the Minnesota Environmental Policy Act "to create and maintain conditions under which human beings and nature can exist in productive harmony and fulfill the social, economic, and other requirements of present and future generations of the state's people" (Minn. Statute 116D.02).

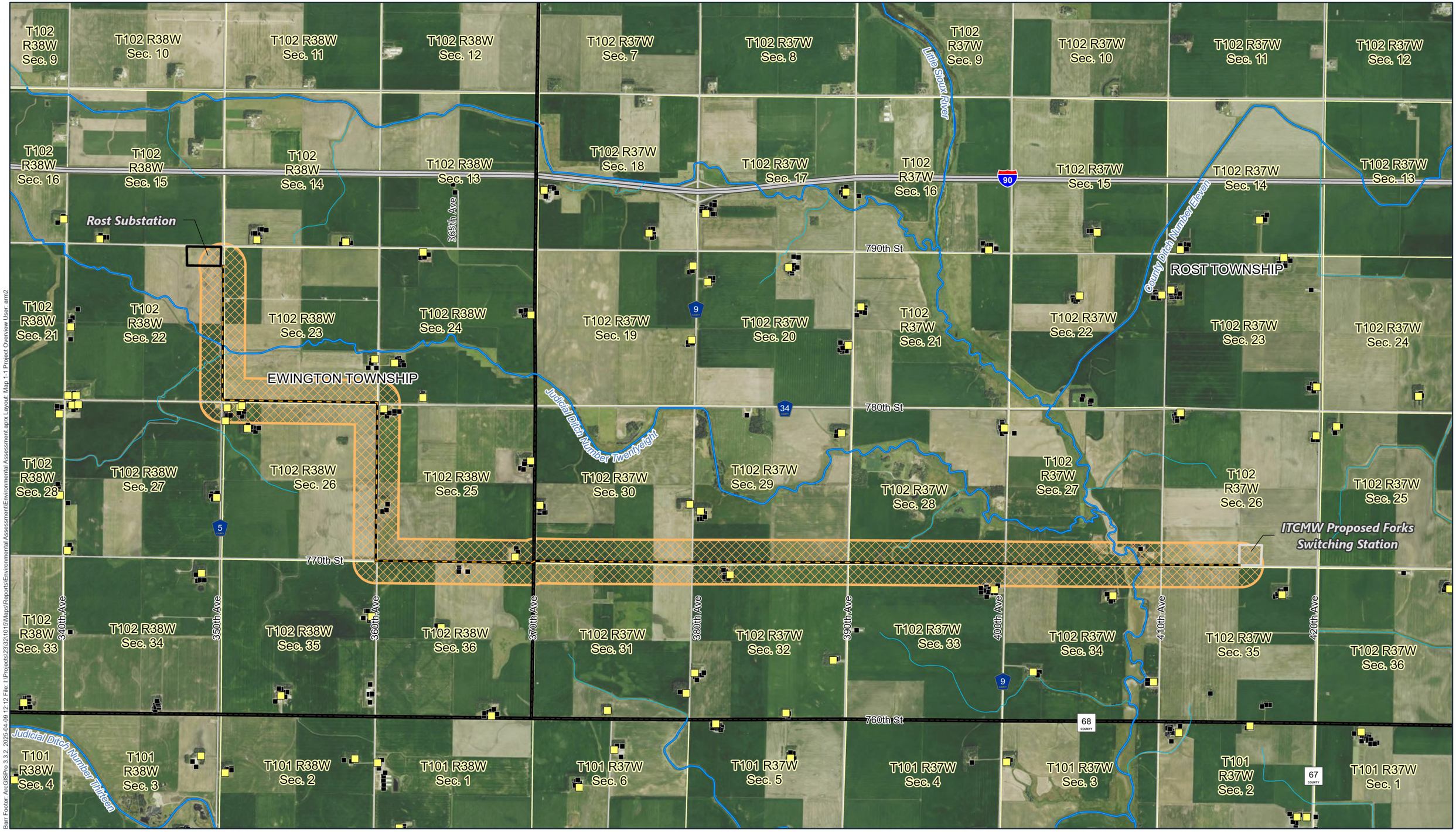
1.1 Purpose and Need

The project is needed to ensure long-term electrical reliability and resilience in the project area. A joint study between the applicant, Great River Energy, and Missouri River Energy Services (MRES) identified long-term reliability and load serving needs for the Worthington, Minnesota area. The project would, in conjunction with the MRES Lorraine Substation project in Worthington and the Great River Energy Rost Substation project and Rost to Lorraine 69 kV transmission line project, address system susceptibility to low voltage conditions when certain transmission facilities are out of service. The project would mitigate low voltage issues experienced by the existing system and help provide long-term reliability for the area, considering existing load and potential future load growth.

1.2 Project Description

The project includes constructing 8.5 miles of 161 kV transmission line in Ewington and Rost Townships, Jackson County, Minnesota. The project would start at the proposed new Rost Substation, near the intersection of County Road 5 and 790th Street. The Rost Substation was permitted and constructed separately by Great River Energy. The project will run south from the Rost substation along County Road 5 until turning east on 780th Street. It will run east for one mile, reaching 360th Avenue, and then turn south for another mile. Then the line will turn east on 770th Street for 5.5 miles until connecting to the new Forks Switching Station, which will be constructed, owned, and operated by the applicant as part of this project (Map 1-1).

The project requires a ROW of 100 feet, with 50 feet on either side of the transmission centerline. Where the project follows existing road (ROW, transmission line structures will be placed approximately 5 to 8 feet outside the road ROW.



Barr Foster ArcGISPro 3.3.2, 2025-04-09 12:12 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 1-1 Project Overview User: arm2

- Applicant's Proposed Alignment
- Route Width (Proposed Route)
- Interstate
- Roads
- Residence
- Out Building
- PWI
- NHD

0 3,000 6,000
Feet

Map 1-1

PROJECT OVERVIEW
Forks-Rost 161 kV Project

1.3 State of Minnesota's Role

The project requires a route permit from the Minnesota Public Utilities Commission (Commission) and approvals (e.g., permits, licenses) from other state and federal agencies with permitting authority for specific resources (e.g., the waters of Minnesota). A route permit supersedes and preempts zoning restrictions, building, and land-use regulations promulgated by local units of government (Minn. Statute 216E.10).

The applicant applied to the Commission for a project route permit on September 30, 2024. With this application, the Commission must determine the most appropriate route for the project and how best to mitigate potential impacts of the project.

To help the Commission with its decision-making and to ensure a fair and robust airing of the issues, the state of Minnesota has set out a process for the Commission to follow in making its decisions. This process requires: (1) the development of an EA and (2) public hearings before an administrative law judge. The goal of the EA is to describe the potential human and environmental impacts of the project ("the facts"); the goal of the hearings is to advocate, question, and debate what the Commission should decide about the project ("what the facts mean"). The entire record developed in this process—the EA and the report from the administrative law judge, including all public input and testimony—is considered by the Commission when it makes its decisions on the applicant's route permit application.

1.4 Organization of Environmental Assessment

This EA is based on the applicant's route permit application, public comments received during the scoping comment period for this EA, and input from the Commission. This EA addresses the matters identified in the project scoping decision (Appendix A), and is organized as outlined in Table 1-1.

Table 1-1 Environmental Assessment Organization Outline

Chapter Number	Chapter Name	Summary
	Summary	Provides a summary of the project – its potential impacts and possible mitigation measures
Chapter 1	Introduction	Provides an overview of the project need, the project itself, the state of Minnesota's role, and discusses the organization of the document.
Chapter 2	Regulatory Framework	Describes the regulatory framework associated with the project, including the state of Minnesota's route permitting processes, the environmental review process, and the permits and approvals that are be required for the project.
Chapter 3	Engineering, Design, and Construction	Describes the engineering, design, and construction of the project.
Chapter 4	Affected Environment, Impacts, and Mitigation Measures	Discusses the resources in the project area and the potential human and environmental impacts of the project. Identifies measures that could be implemented to avoid or mitigate impacts. Also included is a discussion of the potential cumulative effects of the project.
Chapter 5	Application of Routing Factors to the Project	Discusses the merits of the applicant's proposed route relative to the routing factors of Minnesota Rule 7850.4100.
Chapter 6	References	Provides references for resources used in the development of the EA.

1.5 Sources of Information

The primary EA information source is the route permit application submitted by the applicant and other publicly available data sources. Additional sources of information are indicated in Chapter 6. Data provided by the applicant and from state agencies during the preparation of the EA is also included.

A number of spatial data sources, which describe the resources in the project area, were used in preparing this EA (Appendix B). Spatial data from these sources can be imported into geographic information system (GIS) software, where the data can be analyzed and potential impacts of the project and routing alternatives quantified (e.g., acres of forested wetlands within the anticipated project ROW).

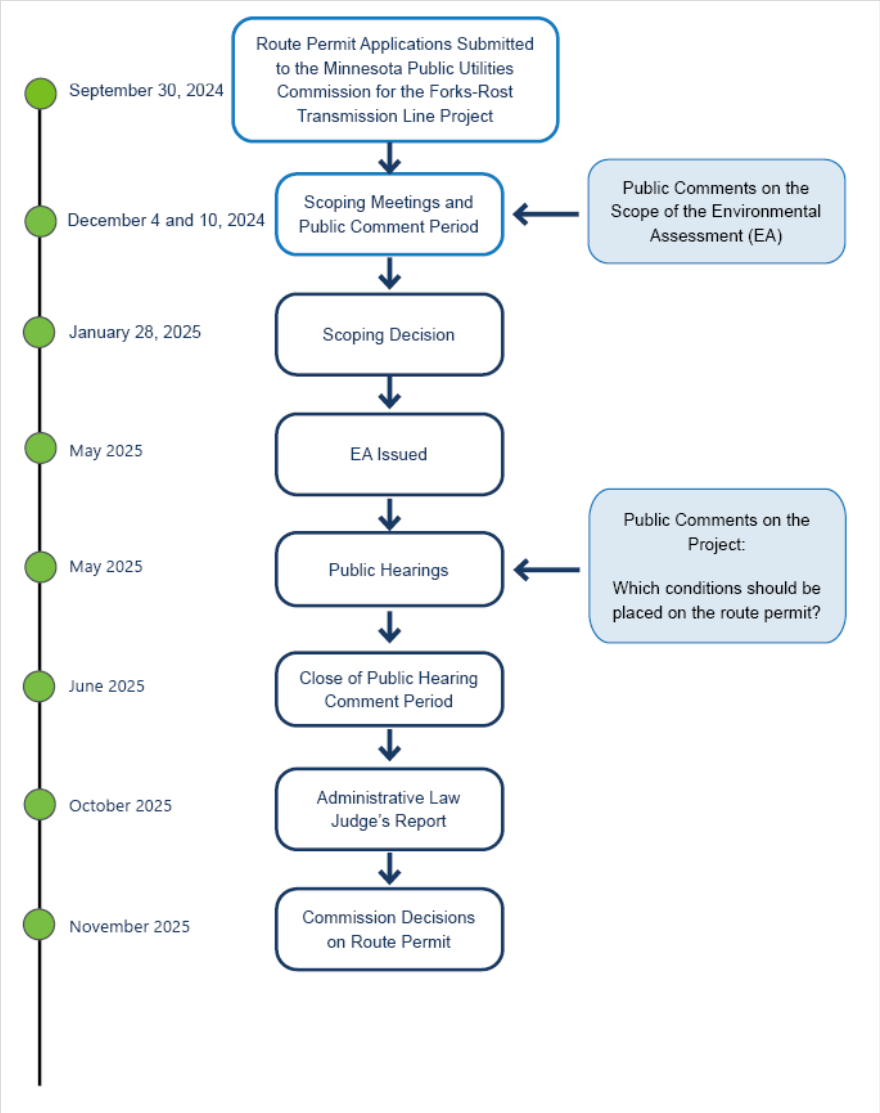
2 Regulatory Framework

This chapter describes the regulatory framework for the project. Department of Commerce, EERA staff is responsible for conducting the project's environmental review. The project will also require approvals from other state and federal agencies with permitting authority over related actions.

2.1 Route Permit

Construction of a high-voltage transmission line in Minnesota requires a route permit from the Commission (Minn. Statute 216E.03). The project, a single-circuit 161 kV transmission line, meets the definition of a high-voltage transmission line and associated facilities. The applicant filed a route permit application on September 30, 2024. The Commission accepted the application as complete on November 12, 2024. The Commission referred the application to the Office of Administrative Hearings and authorized public hearings and environmental review of the project (Figure 2-1).

Figure 2-1 Commission's Environmental Review and Permitting Process for the Project



2.1.1 Route Permit Criteria

The Commission is charged with selecting transmission line routes that minimize adverse human and environmental impacts while ensuring electric power system reliability and integrity. Route permits issued by the Commission include a permitted route and anticipated alignment, as well as conditions specifying construction, restoration and operation standards.

Minn. Statute 216E.03, identifies considerations that the Commission must take into account when designating transmission lines routes, including minimizing environmental impacts and minimizing human settlement and other land-use conflicts. Specifically, the Commission considers the following 14 factors when making a route permit decision (Minn. Rule 7850.4100):

A. Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.

B. Effects on public health and safety.

C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.

D. Effects on archaeological and historic resources.

E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.

F. Effects on rare and unique natural resources.

G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity.

H. Use or paralleling of existing ROW, survey lines, natural division lines, and agricultural field boundaries.

I. Use of existing large electric power-generating plant sites.

J. Use of existing transportation, pipeline, and electrical transmission systems or ROW.

K. Electrical systems reliability.

L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.

M. Adverse human and natural environmental effects which cannot be avoided.

N. Irreversible and irretrievable commitments of resources.

The Commission must make specific findings that it has considered locating a route for a new transmission line along an existing transmission line ROW or parallel to existing highway ROW and, to the extent these are not used for the route, the Commission must state the reasons why (Minn. Statute 216E.03, Subd. 7). The Commission is charged with making a final decision on a route permit within six months after finding the route permit application complete. The Commission may extend this time limit for up to three months for just cause or upon agreement of the applicants. Once a route permit is issued by

the Commission, the applicant could exercise the power of eminent domain to acquire land for the project if deemed necessary (see Chapter 3.3.1 for additional information regarding ROW acquisition).

2.2 Environmental Review

MEPA requires that environmental review be conducted for major governmental actions with the potential to create significant environmental impacts (Minn. Statute 116D.04). For this project, the environmental review is an EA. Department EERA staff is responsible for preparing the EA on behalf of the Commission.

An EA describes and analyzes the potential human and environmental impacts of a project and possible mitigation measures. An EA is intended to facilitate informed decision-making by the Commission and other entities with regulatory authority over a project. It also assists citizens in providing guidance to decision-makers regarding the project.

2.3 Scoping

The first step in preparing an EA is scoping. The purpose of scoping is to provide citizens, local governments, tribal governments, and agencies an opportunity to focus the EA on those issues and mitigation measures that are relevant to the proposed project.

EERA and Commission staff held two public information and scoping meetings to provide information about the permitting process and the project, answer questions, and gather input on topics to study in the EA. The first meeting was held in person on December 4, 2024, at the Lakefield Community Center, in Lakefield, Minnesota. Approximately 20 members of the public attended this meeting. The second meeting was held virtually on December 10, 2024. One member of the public attended the virtual meeting.

A written comment period ending on December 24, 2024, provided the public an opportunity to submit comments on potential impacts and mitigation measures for consideration in the scope of the EA. During the written comment period, one state agency, the DNR, submitted comments. The DNR comments included mitigation measures suggested for study in the EA. No routing alternatives were suggested during scoping.

EERA staff provided a summary of the scoping process and recommendations to the Commission on January 8, 2025. The Commission concurred with EERA's recommendations on January 21, 2025, and authorized EERA to include only the route proposed by applicant in the scoping decision for the EA. The Department issued the scoping decision for the EA on February 10, 2025, (Appendix A), identifying the potential impacts and route to be evaluated in this EA.

2.4 Public Hearing

Upon completion of the EA, a public hearing will be held in the project area. The hearing will be presided over by an ALJ from the OAH. At the public hearing, citizens will have the opportunity to submit comments, present evidence, and ask questions. Citizens can advocate for conditions to be included in the route permit. Members of the public can also comment on the EA regarding any information that might be inaccurate or missing in the document. EERA staff may respond to comments on the EA received during the hearing comment period, but staff is not required to revise or supplement the EA document.

After the public hearing, the ALJ will submit a report to the Commission with findings of facts, conclusions of law, and recommendations regarding a route permit for the project. Upon completion of the

environmental review and hearing process, the record will be presented to the Commission for final decisions.

2.5 Commission Decision

After considering the entire record, including the EA, input received during the public hearings, and the ALJ's findings and recommendations, the Commission will determine whether to grant the project a route permit. The route permits include a permitted route and an anticipated alignment, as well as conditions specifying construction and operating standards. Route permits also typically include mitigation plans and project-specific mitigation measures. Decisions by the Commission on the route permit are anticipated in the fourth quarter of 2025.

2.6 Other Permits and Approvals

A route permit from the Commission is the only state permit required for routing the project. A route permit supersedes local planning and zoning and binds state agencies (Minn. Statute 216E.10); therefore, state agencies are required to engage in the Commission's permitting process to aid in the Commission's decision-making and to indicate routes that are not permittable.

However, several federal, state, and local permits may be required for construction and operation of the project. All permits subsequent to the issuance of a route permit and necessary for the project must be obtained by the applicant. The information in this EA may be used by the subsequent permitting agencies as part of their environmental resource impact evaluation. Table 2-1 lists permits and approvals that could be required for the project, depending on the final design.

Table 2-1 Summary of Possible Permits, Licenses, Approvals, and Consultations

Permit	Jurisdiction
Federal	
Section 404 Clean Water Act – Dredge and Fill	U.S. Army Corps of Engineers – St. Paul District
Section 10 Clean Water Act	
Section 106 of the National Historic Preservation Act	State Historic Preservation Office
Bald and Golden Eagle Protection Act Consultation	U.S. Fish and Wildlife Service
Migratory Bird Treaty Act Consultation	
Section 7 Endangered Species Act Consultation	
Part 7460 Review	Federal Aviation Administration
State	
Route Permit	Minnesota Public Utilities
National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit	Minnesota Pollution Control Agency
License to Cross Public Lands	Minnesota Department of Natural Resources
State Threatened and Endangered Species Consultation	
National Historic Preservation Act Section 106 consultation; Minnesota Field Archaeology Act; Minnesota Historic Sites Act	Minnesota State Historic Preservation Office
Utility Permit	Minnesota Department of Transportation
Driveway Access	
Oversize/Overweight Permit	
Wetland Conservation Act	Minnesota Board of Water and Soil Resources and Jackson County Soil and Water Conservation District
Local	
Road Crossings/ ROW Permits	Jackson County, Ewington Township, Rost Township
Oversize/Overweight Permits	
Driveway/Access Permits	
Utility Permits	

2.6.1 Federal Approvals

The United States Army Corps of Engineers (USACE) regulates potential impacts to waters of the United States. Dredged or fill material, including material that moves from construction sites into these waters, could impact water quality. The USACE requires permits for projects that may cause such impacts. The USACE is also charged with coordinating with the State Historic Preservation Office (SHPO) and Native American tribes regarding potential impacts to significant cultural resources pursuant to Section 106 of the National Historic Preservation Act (NHPA).

The U.S. Fish and Wildlife Service (USFWS) requires permits for the taking of threatened or endangered species, bald and golden eagles, and native migratory birds. The USFWS encourages consultation with

project proposers to ascertain a project's potential to impact these species and to identify general mitigation measures for the project.

The Federal Aviation Administration (FAA) regulates civil aviation, including the airspace used for aviation. The FAA requires permits for tall structures, including transmission line structures, that could adversely impact aviation.

2.6.2 State of Minnesota Approvals

The Minnesota SHPO is charged with preserving and protecting the state's cultural resources. SHPO consults with project proposers and state agencies to identify cultural resources (e.g., through surveys) and to avoid and minimize impacts to these resources.

The DNR regulates potential impacts to Minnesota's public lands and waters. The DNR requires a license to cross public lands and waters; licenses may require mitigation measures. Similar to the USFWS, the DNR also encourages consultation with project proposers to ascertain a project's potential to impact state-listed threatened and endangered species and possible mitigation measures.

A general NPDES / Sanitary Disposal System (SDS) construction stormwater permit from the Minnesota Pollution Control Agency (MPCA) is required for stormwater discharges from construction sites. A permit is required if a project disturbs 1 acre or more of land. The general NPDES/SDS permit requires (1) use of best management practices (BMPs), (2) a stormwater pollution prevention plan, and (3) adequate stormwater treatment capacity once the project is constructed. The NPDES/SDS permit intends that state water quality standards are not compromised.

The Minnesota Board of Water and Soil Resources (BWSR) oversees implementation of Minnesota's Wetland Conservation Act (WCA). The WCA is implemented by local units of government (LGUs). For linear projects that cross multiple LGUs, BWSR typically coordinates the review of potential wetland impacts among the affected LGUs. The WCA requires anyone proposing to impact a wetland to (1) try to avoid the impact, (2) try to minimize any unavoidable impacts, and (3) replace any lost wetland functions.

A permit from the Minnesota Department of Transportation (MnDOT) is required for transmission lines that are adjacent to or cross over Minnesota trunk highway ROW. MnDOT's utility accommodation policy generally allows utilities to occupy portions of highway ROW where such occupation does not put the safety of the traveling public or highway workers at risk or unduly impair the public's investment in the transportation system.

2.6.3 Local Approvals

The Commission's route permit supersedes local planning and zoning regulations and ordinances. However, the applicants must obtain all local approvals necessary for the project that are not preempted by the Commission's route permit, such as approvals for the safe use of local roads.

2.6.4 Other Approvals

Other approvals and/or crossing agreements may be required where project facilities cross an existing utility, such as a pipeline, solar facility, or railway. The need for such approvals would be determined after the final route is selected, and the applicant has indicated that these approvals would be obtained after a route permit has been issued by the Commission.

2.6.5 Electric Safety and Reliability Costs

The project must meet the requirements of the National Electrical Safety Code (NESC). Utilities must comply with the most recent edition of the NESC, as published by the Institute of Electrical and Electronics Engineers, Inc., and approved by the American National Standards Institute, when constructing new facilities or upgrading existing facilities (Minn. Statute 326B.35).

The NESC is designed to protect human health and the environment. It also ensures that the transmission lines and all associated structures are built from high-quality materials that will withstand the operational stresses placed upon them over the expected lifespan of the equipment, provided that routine maintenance is performed.

Utilities must also comply with North American Electric Reliability Corporation (NERC) standards. NERC standards define the reliability requirements for planning and operating the electrical transmission grid in North America.

3 Overview of Project

The applicant is proposing to construct an approximately 8.5-mile long, 161 kV transmission line in Minnesota. The project would start at the new Rost Substation, and after generally travelling east it would end at the new Forks Switching Station. The project is within Ewington and Rost Townships, Jackson County, Minnesota.

This chapter describes the transmission line structures and components that could be used for the project and the project's associated facilities. Additionally, this chapter discusses how the project would be constructed and its anticipated costs and schedule. Several terms used throughout this Chapter and the remaining document have specific meanings and are defined here for clarity.

- **ROW** means the land interest required within a route for the construction, maintenance, and operation of a high-voltage transmission line (Minn. Rule 7850.1000).

- **ROW sharing** means that the new transmission line would be co-located with an existing transmission line or other existing infrastructure ROW (e.g., transportation corridors, pipelines, etc.) to partially share that existing ROW and lessen the overall easement width required from landowners.

3.1 Engineering and Design

Design of transmission lines and associated facilities occurs through multiple stages including identification of existing rights-of-way; transmission line design; ROW acquisition; and geotechnical investigations. The applicant has proposed a single circuit design, using aluminum conductor steel reinforced conductor line, and incorporating two structure types for the project to allow for multiple configurations (Table 3-1). This chapter describes the transmission lines, structures, and configurations that may be used for the project.

Table 3-1 Types of 161 kV Structures Proposed for the Project

Structure Type	Material	Approximate Height Above Ground (feet)	Foundation Diameter (feet)	Span Between Distances (feet)
Monopole	Steel	80 – 120	3 – 5	600 – 800
Monopole (Deadends and Tangents)	Steel	80 – 120	10 – 12	600 – 800

Note: The values in the table are typical values expected for the majority structures based on similar facilities. Actual values may vary.

3.1.1 Transmission Lines

Transmission line circuits consist of three phases, each phase at the end of a separate insulator and physically supported by a structure that holds it above ground. A phase consists of one or more conductors: single, double, or bundled. A typical conductor is a cable consisting of aluminum wires configured in strands around a core of steel wires. There may also be shield wires strung above the phases to prevent damage from lightning strikes. The majority of the project would consist of a single circuit, 161 kV line with steel monopole structures spaced approximately 600 to 800 feet apart.

3.1.2 Structures

The transmission line will be constructed using single circuit, braced post monopole steel structures. The use of monopoles minimizes the project footprint and ROW requirements. Proposed structure designs are shown in Figure 3-2. Transmission structures typically range in height from 80 to 120 feet above ground, depending upon the terrain and environmental constraints. The average diameter of the steel structures at ground level is 7.5 feet.

Some project structures may be installed using a vibratory caisson foundation. Vibratory caissons are a foundation type that can be used in place of typically installed direct embed structure foundations. A vibratory caisson is a straight steel pole section with no bottom that is driven into the ground with a vibratory hammer. The caisson is attached to the hammer, lifted into place, and dropped until it contacts the ground. Then, the hammer vibrates at a high frequency while applying a downward force. This foundation installation method does not produce spoils as would a drilled pier or other traditional foundation type.

A dead-end structure is used to change direction and/or wire tension on a transmission line. Dead-end structures are also used as “storm structures” to limit the number of structures damaged by a cascading effect due to higher line tensions when a pole is knocked down by a storm. Dead-end structures are depicted in Figure 3-1 and would be steel on concrete foundations.

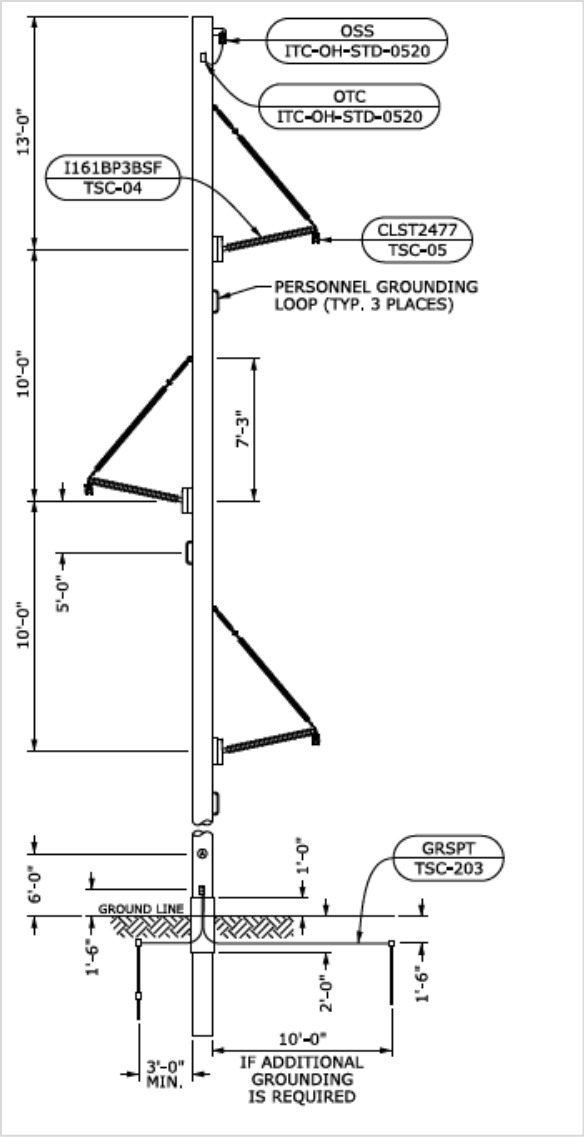


Figure 3-2 Typical Tangent Transmission Structure

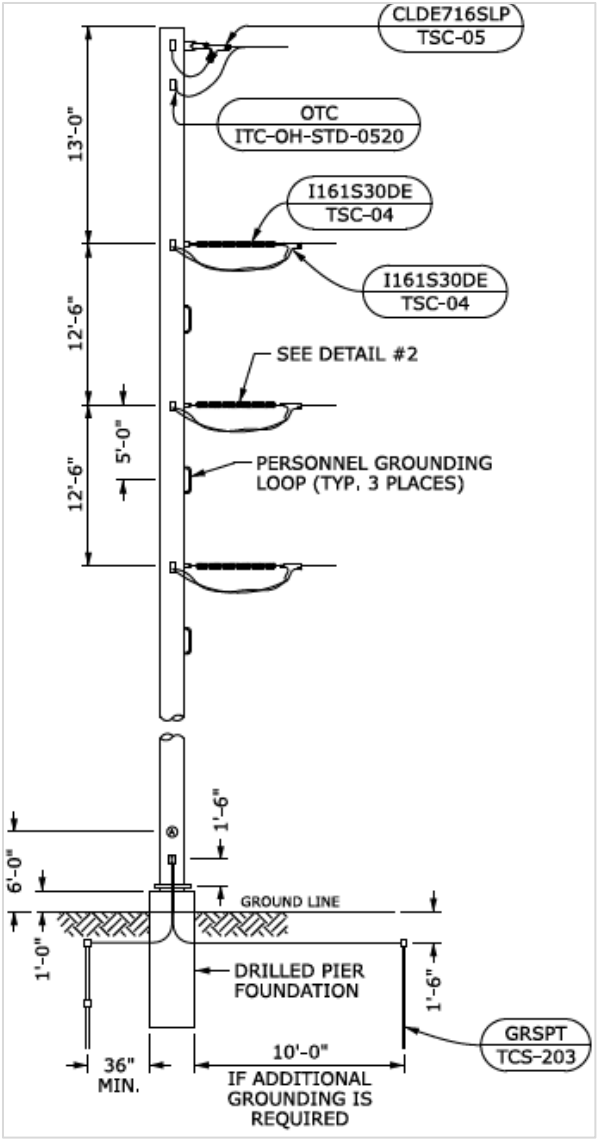


Figure 3-1 Typical Dead-end Transmission Structure

3.1.3 Conductors

The single circuit structures will have three single conductor phase wires and one shield wire. It is anticipated that the phrase wires will be “T2 Grosbeak” which consists of two aluminum conductor steel reinforced “Grosbeak” conductors in a twisted pair configuration, or a conductor with similar electrical capacity and mechanical strength properties. The shield wire will be a 48-count optical ground wire.

3.1.4 Associated Facilities

Associated facilities proposed for the project include the new Forks Switching Station. The new Forks Switching Station will be equipped with SF6 gas circuit breakers with current sensing transformers, voltage sensing and station service type transformers, and a control enclosure which will house required relaying equipment and supervisory control and data acquisition (SCADA) equipment. This equipment is

designed to protect human health as well as the other equipment on the transmission system by isolating the fault and de-energizing a transmission line should any unsafe line faults occur on it, while keeping the other transmission lines connected to the Forks Switching Station in-service. Figure 3-3 depicts the proposed location for the Forks Switching Station.

The Forks Switching Station will initially have three 161 kV lines connected to it. In addition to the new Forks – Rost 161 kV line that will be constructed by this project, the existing ITC Midwest Lakefield Junction – Dickinson County 161 kV line will tie into the Forks Switching Station creating the Forks – Lakefield Junction and Dickinson County – Forks 161 kV lines.

Figure 3-3 Proposed Forks Switching Station Location

(Looking north from 770th Street in Ewington Township in Jackson County)

3.2 Route Width, Right-of-Way, and Anticipated Alignment

When the Commission issues a route permit, it approves a route, a route width, and an anticipated alignment within that route width. The Commission may include conditions in a route permit. These conditions could address the route width or anticipated alignment in a specific area of the project, for

example, requiring the alignment of a specific portion of the route to be north rather than south of a road or requiring that the route width be narrower in a certain area.

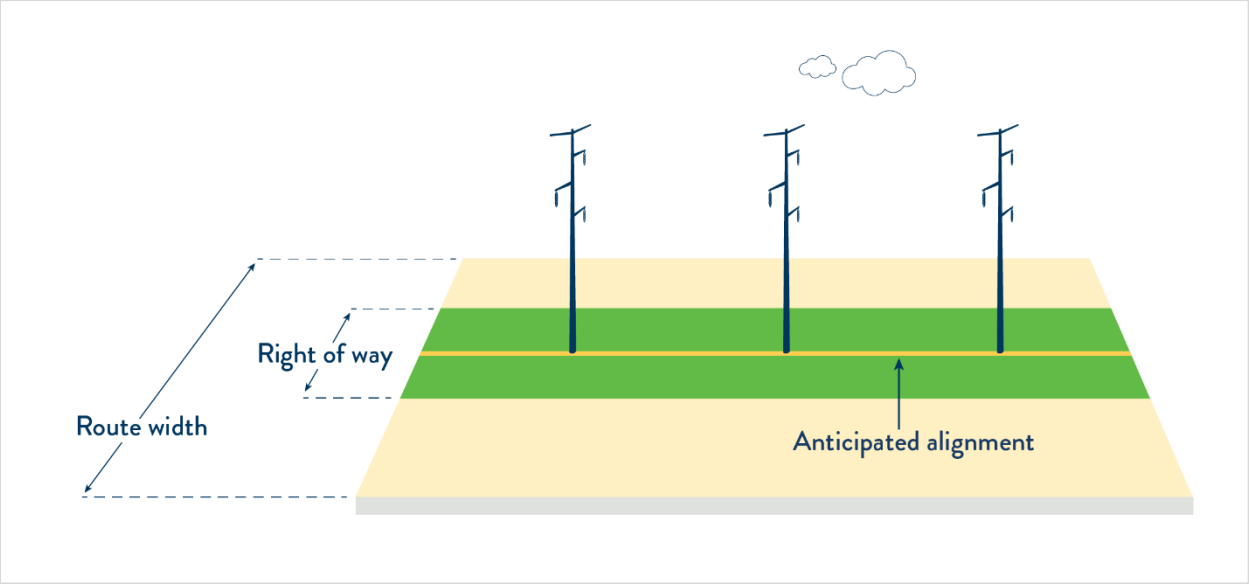
3.2.1 Route Width

The route width is typically larger than the actual ROW needed for the transmission line (Figure 3-4). This additional width provides flexibility in constructing the line, yet is not of such extent that the placement of the line is undetermined. The route width allows the applicant to work with landowners to address their concerns and to address engineering concerns that may arise after a permit is issued. The route width, in combination with the anticipated alignment, is intended to balance flexibility and predictability.

The transmission line must be constructed within the route width designated by the Commission unless, after permit issuance, permission to proceed outside of the route width is sought by the applicant and approved by the Commission.

In general, the applicant is requesting a route width of 750 feet on either side of the proposed transmission line centerline for a total of a 1,500-foot route width. The applicant is requesting a route width that is wide enough to provide flexibility to make alignment adjustments during the final design to work with landowners, to avoid sensitive natural resources, and to manage construction constraints as needed.

Figure 3-4 Route Width, Right-of-Way, and Anticipated Alignment Schematic



3.2.2 Right-of-Way

The right-of-way (ROW) is the specific area required for the safe construction and operation of the transmission line, where such safety is defined by the NESC and the NERC reliability standards. The ROW must be within the designated route and is the area for which the applicant obtains rights from private landowners to construct, operate, and maintain the line.

Once the Commission issues a route permit, the applicant will conduct detailed survey and engineering work. Additionally, the applicant will contact landowners to gather information about their property and

concerns and to discuss how the transmission line ROW might best proceed across the property. A transmission line ROW across private property is typically obtained by an easement agreement between the applicant and landowners.

The applicant has indicated that the project requires a permanent 100-foot-wide ROW (50 feet on either side of the centerline). However, additional temporary workspace beyond the 100-foot-wide ROW may be required for construction at certain locations, such as at road or railroad intersections, utility crossings, along steep slopes, and at stringing locations. In addition, there will be temporary staging of materials such as structures and hardware along the ROW prior to construction.

3.2.3 Anticipated Alignment

The anticipated alignment is the anticipated placement of the transmission line within the route width and ROW; in essence, where the transmission line is anticipated to be built.

After coordinating with landowners and completing detailed engineering plans, the applicant would establish the final project alignment and designate pole placements. These final plans, known as “plans and profiles,” must be provided to the Commission so that they can confirm that the applicant’s plans are consistent with the route permit and all permit conditions prior to construction of the project. This confirmation provides the basis that the built project alignment is consistent with the anticipated alignment in the Commission’s permit.

3.3 Construction and Maintenance

Construction of the project would not begin until all necessary federal, state, and local approvals have been obtained, easements have been acquired for ROW, and final plans and profiles have been approved by the Commission. The precise timing and order of ROW clearing and construction along the line will depend on the receipt of all necessary approvals, landowner agreements, and available workforce.

3.3.1 Right-of-Way Acquisition

After a route permit is issued, the applicant will evaluate what land rights are needed for the project. Then, the applicant and its agents will work directly with individual landowners to acquire the necessary easements for the project. While easement negotiations will not formally begin until after the Commission approves the route, the applicant will continue to engage with landowners through the permitting process to answer any questions they may have regarding the easement process or the project.

New easements will be needed for the 161 kV transmission line. The applicant will work with individual landowners to negotiate the necessary easements. At a minimum, the project would obtain a permanent ROW of 100 feet for the 161 kV transmission line system. Where the transmission line parallels roads, the transmission line structures are typically set back approximately 5 to 8 feet from the road ROW.

Land for the Forks Switching Station will be purchased in fee by the applicant. The final area and design of the station will be determined after approval of the route permit, but the anticipated dimensions are approximately 375 feet by 325 feet (2.8 acres).

In addition to permanent easements needed for the construction of the line, agreements may be obtained from certain landowners for temporary construction or staging areas for the storage of poles, vehicles, or other related items.

3.3.2 Right-of-Way Access

The applicant will evaluate construction access opportunities by identifying existing easements, roads, and/or trails adjacent to the permitted route. Where feasible, the applicant indicated that they will limit access and construction activities to the ROW acquired for the project to minimize impacts to landowners and adjacent properties. In some situations, private field roads, trails, or farm fields may be used to gain access to construction areas. Where no current access is available, where existing access is inadequate, or when access requires incorporation of areas outside the ROW, permission from landowners will be obtained prior to using any of these areas to access the ROW for construction.

Improvements to existing access or construction of new access could be required to accommodate construction equipment. Where applicable, the applicant will obtain permits for new access from local road authorities. The applicant will work with appropriate road authorities to agree on proper maintenance of roadways traversed by construction equipment.

3.3.3 Equipment and Staging

Construction activities will require the use of many different types of equipment, including, but not limited to, tree removal equipment, mowers, cranes, backhoes, line trucks, drill rigs, dump trucks, front-end loaders, bulldozers, flatbed trucks, concrete trucks, cranes, and various trailers for hauling equipment. Excavation equipment is often set on wheel or track-driven vehicles. Small grading equipment will also be used at the switching station. Where possible, construction crews will use equipment that minimizes land impacts.

Construction staging areas will be required for the project and will be identified after a route is permitted. To the extent practicable, staging areas will be located on previously disturbed sites and will be used as receiving locations for delivery and storage of construction materials and equipment until they are needed for the project. Preferable staging areas will be large enough to lay down material and pre-assemble certain structural components or hardware. For staging areas outside the project ROW, rights to use these areas will be obtained individually from the landowners.

3.3.4 Construction Process

Construction for the project will begin once all required approvals are obtained, property and ROWs are acquired, and final design is complete. Construction of an overhead transmission line requires several different activities at any given location. Major construction activities and the approximate construction sequence are described below. Construction will follow the applicant's standard construction and mitigation best practices. Construction typically occurs as follows:

- Surveying and staking the ROW
- ROW clearing and preparation
- Grading/filling, as needed
- Installing foundations
- Installing poles and related equipment
- Stringing conductors

- Installing any require aerial markers

After land rights have been secured and prior to the start of construction activities, landowners will be notified of the project schedule and other related construction activities.

3.3.4.1 Staking and ROW Preparation

The first step of the transmission line construction activities involves survey staking the transmission line centerline and/or pole locations, followed by removal of trees and other vegetation from the ROW. The applicant will use an integrated vegetation management plan that incorporates a wire/border zone practice for ROW clearing and maintenance. As a general practice, low-growing brush or tree species are allowable at the outer limits (the “border zone”) of the easement area. Taller tree species that endanger the safe and reliable operation of the transmission facility will be removed.

In developed areas and to the extent practical, existing low-growing vegetation that will not pose a threat to the transmission facility or impede construction or maintenance may remain in the border zone, as agreed to during easement negotiations. The area below the outer conductors plus 10 to 15 feet (the “wire zone” or “clear zone”) is cleared of all shrubs and trees to provide maintenance trucks access to the line and to be sure that vegetation does not interfere with the safe operation of the transmission line. Very little tree trimming, or removal is anticipated due to the project’s location within agricultural land.

All materials resulting from clearing operations would either be chipped on site and spread on the ROW, stacked in the ROW for use by the property owner, or removed and disposed of otherwise as agreed to with the property owner during easement negotiations or in accordance with agency requirements.

The final survey staking of pole locations may occur after the vegetation has been removed and just prior to structure installation.

3.3.4.2 Structure Installation

Before the structures are installed, existing underground utilities are identified along the route through the required Gopher State One Call process. If temporary removal or relocation of fences is necessary, installation of temporary or permanent gates will be coordinated with the landowner. Depending on the timing of construction, the ROW agent may work with the property owner for early harvest of crops, where possible, with compensation to be paid for any actual crop losses. During the construction process, it may be necessary for the property owner to remove or relocate equipment and livestock from the ROW. Compensation related to these activities would be discussed with the landowner during easement negotiations.

Transmission line structures are generally designed for installation at existing grades. Therefore, structure sites would not be graded or leveled unless it is necessary to provide a reasonably level area for construction access and activities. For example, if vehicles or installation equipment cannot safely access or perform construction operations properly near the structure, minor grading of the immediate terrain may be necessary. The applicant will employ standard construction and mitigation practices as well as industry-specific BMPs. BMPs address ROW clearing, erecting transmission line structures, and stringing transmission lines. BMPs for each specific project are based on the proposed schedules for activities, prohibitions, maintenance guidelines, inspection procedures, and other practices. In some circumstances, these activities, such as schedules, are modified to incorporate BMP installation that will assist in minimizing impacts to sensitive environments. Any contractors involved in the construction of the transmission line are required to adhere to these BMPs.

The proposed structures are steel poles, which may be directly embedded, installed on a vibratory caisson foundation, or set on a concrete foundation. The concrete foundations are approximately 3 to 12 feet in diameter and generally are exposed 1 foot above the existing ground. Concrete trucks are used to bring the concrete in from a local concrete batch plant.

After a direct-embedded pole is set into the hole, the void space is backfilled with crushed rock. Based on typical soil types in Minnesota, it is anticipated that the 80-foot above ground pole would be buried approximately 15 feet into the ground. In poor soil conditions (e.g., peat, marl, soft clay, or loose sand) a galvanized steel culvert is sometimes installed vertically with the structure set inside.

3.3.4.3 Conductor Stringing

After a number of structures have been erected, the project begins to install the conductors and shield wires by establishing stringing setup areas within the ROW. These stringing setup areas are located at dead-end structures along a project route and occupy approximately 15,000 square feet (0.34 acres) for linear segments of the line and approximately 30,000 square feet (0.69 acres) for angled segments of the line. Conductor stringing operations require brief access to each structure to secure the conductor wire and shield wire once the final sag is established. Temporary guard or clearance structures are installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways, or other obstructions after any necessary notifications are made or permits obtained. This helps make sure that conductors will not obstruct traffic or contact existing energized conductors or other cables while protecting the conductors from damage.

3.3.4.4 Switching Station

The final switching station fence line includes an area of approximately 2.8 acres. The site would be surveyed for initial grading work. A Gopher State One-Call utility location would be completed prior to beginning work. Once the initial grading is completed, the site will be re-surveyed to establish equipment and structure locations.

The footprint for the switching station typically includes installing a layer of sand and a layer of compacted class 5 aggregate as a base material. Excavation or drilling would be completed as necessary for concrete foundations and piers to support the station equipment, and concrete will be poured for the foundations or piers. Buildings, structural rigid metal conductors called buswork, breakers, fencing, necessary switches and control equipment, and the transmission line structures for the new 161 kV line will be erected. Once the majority of the equipment has been erected, the station footprint will be topped with 4 to 6 inches of crushed rock.

A short outage will be needed to connect the existing 161 kV line to the new Forks Switching Station. Any and all outages will be coordinated through MISO to mitigate potential impacts to load or generation. MISO ensures that no other planned outages during the same time frame will negatively impact system reliability, evaluating and planning of switching within the transmission system to enhance reliability of the system, and if necessary, scheduling the outage during low demand periods or low generation output periods.

All construction will be completed in accordance with state, NESC, and the applicant's construction standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, erection of power poles (to connect the line to the substation) and stringing of transmission line conductors.

3.3.5 Restoration and Cleanup

Disturbed areas will be restored to their original condition to the maximum extent practicable, or as negotiated with the landowner. Post-construction reclamation activities will include removing and disposing of debris, removing all temporary facilities (including staging and laydown areas), installing appropriate erosion and sediment control BMPs, reseeding areas disturbed by construction activities with vegetation similar to that which was removed with a seed mixture certified as free of noxious or invasive weeds, and restoring the areas to their original condition to the extent possible. In cases where soil compaction has occurred, the construction crew or a restoration contractor will use various methods to alleviate the compaction, as coordinated with affected landowners.

The applicant will contact landowners after construction is complete to determine if the clean-up measures are to their satisfaction and if any other damage may have occurred. If damage has occurred to crops, fences, or the property, the applicant will compensate the landowner. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition.

3.3.6 Operations and Maintenance Procedures

The project will be designed and maintained in accordance with the NESC and the applicant's standards. In general, transmission lines boast a high level of reliability and lengthy service life, often spanning decades, and seldom undergo complete retirement. Transmission lines have very few mechanical elements, are designed to function for decades, and are constructed to withstand weather extremes typical of the region.

The applicant will be responsible for the operation and maintenance of the project, which will include performing annual inspections and addressing and correcting any deficiencies identified during these examinations. Applicant inspections will be limited to the ROW and to areas where obstructions or terrain may require off ROW access. The ROW will be managed by the applicant or its contractors to control encroachment that may interfere with transmission line operation, including vegetation management activities. Vegetation management activities within the ROW may include mechanical clearing, hand clearing, and herbicide application.

3.4 Project Costs

Total estimated costs to construct the project are approximately $13.5 to $18.8 million, based on 2023 dollars (Table 3-2).

Table 3-2 Estimated Project Construction Costs

Project Component	Lower-Range ($Millions)	Mid-Range ($Millions)	Upper-Range ($Millions)
Transmission Line	$8.2	$9.5	$10.7
Switching Station	$5.3	$6.2	$8.1
Total	$13.5	$15.7	$18.8

3.5 Project Schedule

It is anticipated that the Commission will make decisions on the applicant's route permit application in November 2025. The applicant anticipates that project construction would commence in April 2026. The start of construction is dependent on the receipt of all required permits and approvals. The applicant anticipates that the project would be energized in December 2026.

4 Affected Environment, Potential Impacts, and Mitigation Measures

This chapter provides an overview of human and environmental resources that may be affected by the project. It discusses potential project impacts on these resources and measures that could be used to avoid, minimize, and mitigate these impacts.

Project construction and operation may impact certain human and environmental resources. Some impacts will be short-term and similar to those of any large construction project (e.g., noise, dust, soil disturbance). Impacts may be mitigated by measures common to most construction projects; for example, the use of erosion-control blankets and silt fencing.

Other impacts will exist for the life of the project and may include aesthetic impacts, impacts on agriculture, and impacts on natural resources. Long-term impacts are generally not well mitigated by construction measures, meaning these impacts do not flow from how the project is constructed but rather where it is located and its design. Long-term impacts can be mitigated through prudent project design. Detailed tables summarizing data used for impact analyses are included in Appendix C.

4.1 Describing Potential Impacts and Mitigation

This chapter analyzes potential human and environmental impacts of the project on various resources. Understanding these impacts involves contextualizing their duration, size, intensity, and location. This form of contextual information serves as the basis for assessing overall impact of the project on resources.

- **Duration**—Impacts vary in length of time. Short-term impacts are temporary and generally associated with construction. Long-term impacts are associated with operation and usually end with decommissioning and reclamation. Permanent impacts extend beyond the decommissioning stage.
- **Size**—Impacts vary in size. To the extent possible, potential impacts are described quantitatively, for example, the number of impacted acres or the percentage of affected individuals in a population.
- **Intensity**—Impacts vary in the severity to which a resource is affected, in whatever context that impact occurs.
- **Location**—Impacts are location dependent. For example, common resources in one location might be uncommon in another.

Instead of assigning values based on resource significance, qualitative descriptors are employed. These descriptors provide a standardized language for comparing impact levels and characteristics of the proposed route. This approach offers the reader a clear, common understanding of potential route impacts. For this work, the qualitative descriptors are as follows:

- **Minimal**—Minimal impacts do not considerably alter an existing resource condition or function. Minimal impacts may, for some resources and at some locations, be noticeable to an average observer. These impacts generally affect common resources over the short term.

- **Moderate**—Moderate impacts alter an existing resource condition or function and are generally noticeable or predictable for the average observer. Effects may be spread out over a large area, making them difficult to observe, but can be estimated by modeling or other means. Moderate impacts may be long term or permanent to common resources but are generally short- to long-term for rare and unique resources.

- **Significant**—Significant impacts alter an existing resource condition or function to the extent that the resource is severely impaired or cannot function. Significant impacts are likely noticeable or predictable for the average observer. Effects may be spread out over a large area making them difficult to observe but can be estimated by modeling. Significant impacts can be of any duration and may affect common and rare and unique resources.

This EA also discusses ways to avoid, minimize, or mitigate specific impacts. These actions are collectively referred to as mitigation.

- **Avoid**—Avoiding an impact means that the impact is eliminated altogether by moving or not undertaking parts or all of a project.

- **Minimize**—Minimizing an impact means to limit its intensity by reducing the project size or moving a portion of the project from a given location.

- **Mitigate**—Impacts that cannot be avoided or minimized could be mitigated. Impacts can be mitigated by repairing, rehabilitating, or restoring the affected environment, or compensating for it by replacing or providing a substitute resource elsewhere.

4.1.1 Regions of Influence

Potential impacts to human and environmental resources are analyzed in this EA within specific regions of influence (ROI). The ROI for each resource is the geographic area within which the project may exert some influence. It is used in the EA as the basis for assessing potential impacts to each resource as a result of the project. Regions of influence vary with the resource being analyzed and potential impact (Table 4-1). In this EA, the following ROI are used:

- **ROW**. At a minimum, the project will require a distance of 50 feet on each side of the anticipated alignment (100 feet total). ROW is used as the ROI for analyzing potential displacement impacts and impacts to certain elements of land-based economies, the natural environment, and rare and unique natural species.

- **Route Width**. The route width for the project corresponds generally to a distance of 750 feet on each side of the anticipated alignment (1,500 feet total). The route width is used as the ROI for analyzing potential impacts on archaeological and historic resources, public health and safety, noise, and geology.

- **One thousand feet**. A distance of 1,000 feet (2,000 feet total) from the anticipated alignment for the project is used as the ROI for analyzing potential aesthetic and property value impacts, understanding the number of residences in proximity to the project, as well as impacts to certain elements of transportation and public services, and zoning and land use compatibility. Impacts may extend outside of the 1,000-foot distance but are anticipated to diminish relatively quickly such that potential impacts outside of this distance would be minimal.

- **One mile**. A distance of 1 mile (2 miles total) from the project is used as the ROI for archaeological and historic resources, rare and unique species, and airports and airstrips.
- **Project Area**. The project area, defined generally as the civil townships through which the project passes, is used as the ROI for analyzing potential impacts on cultural values, socioeconomics and environmental justice, emergency services, greenhouse gases, climate resilience, air quality, tourism, and recreation. These are resources for which impacts may extend throughout communities in the project area.

Table 4-1 Regions of Influence

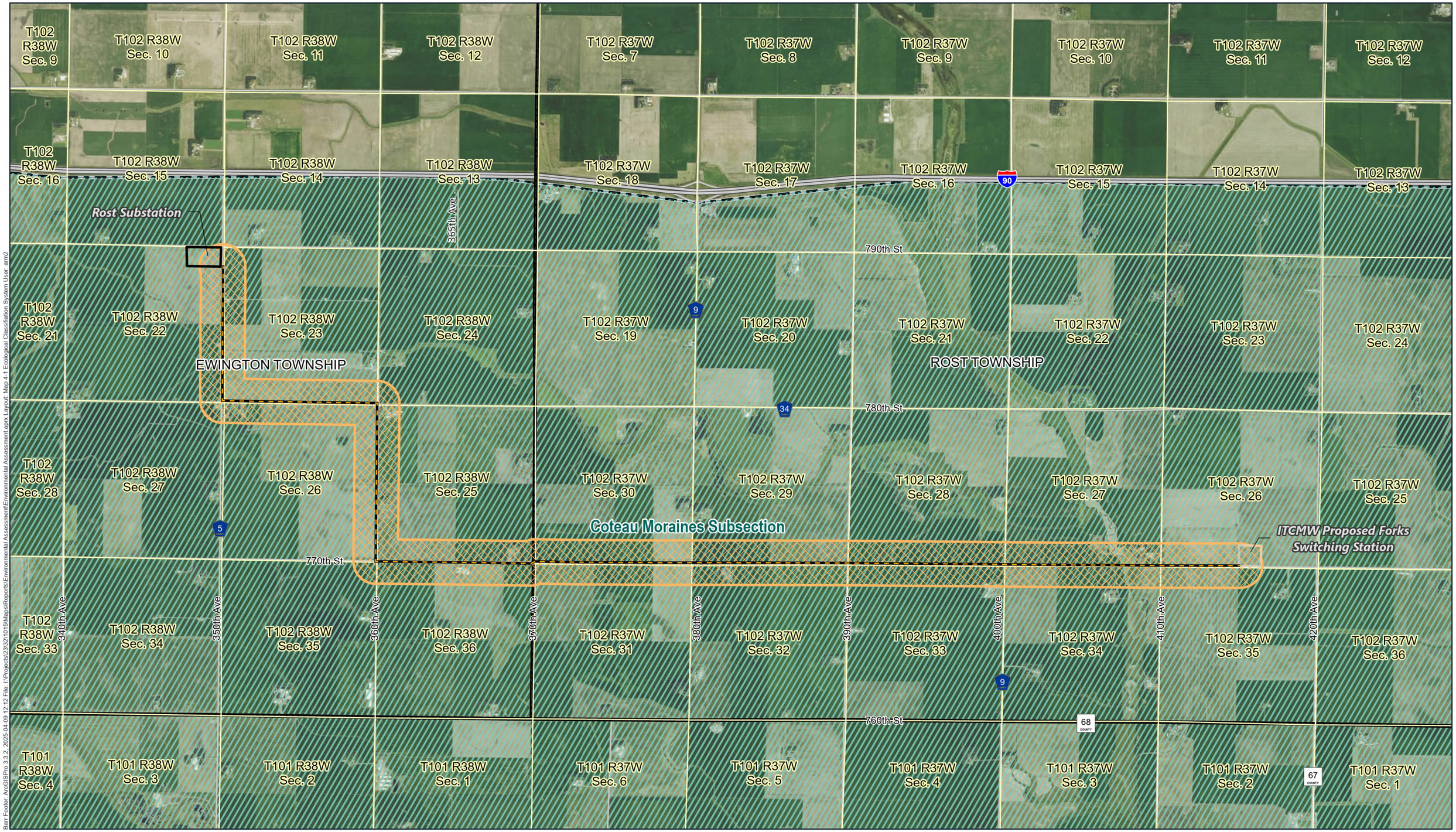
Type of Resource	Specific Resource/Potential Impact to Resource	Region of Influence (ROI)
Human Settlement	Displacement	ROW
Human Settlement	Aesthetics, Property Values, Electronic Interference, Noise, Zoning and Land Use Compatibility	1,000 feet
Human Settlement	Cultural Values, Socioeconomics/EJC	Project Area
Transportation and Public Services	Roadways/Railways, Public Utilities	1,000 feet
Transportation and Public Services	Emergency Services	Project Area
Transportation and Public Services	Airports	1 Mile
Public Health and Safety	Electric and Magnetic Fields, Implantable Medical Devices, Stray Voltage, Induced Voltage	Route Width
Climate Change	Greenhouse Gases, Climate Resilience	Project Area
Air Quality	Air Quality	Project Area
Land-Based Economies	Agriculture, Forestry, Mining	ROW
Land-Based Economies	Tourism and Recreation	Project Area
Archaeological and Historic Resources	Archaeological Resources; Historic Architectural Resources	Route Width, 1 Mile
Natural Environment	Water Resources	ROW
Natural Environment	Soils	ROW
Natural Environment	Vegetation and Wildlife	ROW
Natural Environment	Geology	Route Width
Rare and Unique Natural Resources	Protected Species	1 Mile
Rare and Unique Natural Resources	Sensitive Ecological Resources	ROW, 1 Mile

4.2 Environmental Setting

The project is located in southwest Minnesota in Jackson County. Generally, the project is located within a low density, rural, agricultural landscape. The nearest town to the project is Lakefield, which is located approximately 5.5 miles northeast of the project.

The DNR and the U.S. Forest Service (USFS) have developed an Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features (reference (2)). Map 4-1 shows the ecological sections and subsections near the project. The ECS splits Minnesota into ecological provinces, sections, and subsections. The project is within Prairie Parkland province, which experienced glaciation during the last ice age and has deposits of glacial drift (reference (3)).

The project is within the Coteau Moraines subsection of the North Central Glaciated Plains ecological section. This zone is a transition from shallow loess deposits over glacial till to deep loess deposits. The subsection has two landforms present – rolling moraines to terminal moraines along the outer edges of the subsection. Pre-settlement vegetation consisted of tallgrass prairies with forests concentrated along streams (reference (4)). Currently, the land in this region is used for agriculture.



Applicant's Proposed Alignment
Forks-Rost Project Area
Route Width (Proposed Route)
Ecological Subsection
Prairie Parkland Province,Coteau Moraines

0 3,000 6,000
Feet

Map 4-1

ECOLOGICAL CLASSIFICATION
Forks-Rost 161 kV Project

4.3 Human Settlements

Transmission lines have the potential to negatively impact human settlements through a variety of means. Transmission line structures and conductors could change the aesthetics of an area, displace homes or businesses, introduce new noise sources, lower property values, be incompatible with local zoning, and/or interfere with electronic communications. Impacts to human settlements resulting from the project are anticipated to be minimal to moderate.

4.3.1 Aesthetics

The aesthetic and visual resources of a landscape are defined as the existing natural and built features which affect the visual quality and character of an area. Determining the relative scenic value or visual importance in any given area depends, in large part, on the individual viewer, or community of viewers, whose perceptions are shaped by their values and experiential connection to the viewing area, as well as their physical relationship to the view, including distance to structures, perspective, and duration of the view.

Landscapes that are, for the average person, harmonious in form and use are generally perceived as having greater aesthetic value. Infrastructure that is not harmonious with a landscape or affects existing landscape features reflects a change in the aesthetic view that, for some or many, could negatively affect a viewer's perception and expectation of the area. Assessing visual quality reflects the difference between the landscape change and the individual or communal reaction to that change. As noted above, individual or communal perspectives are complex, affected by individual or shared values and experiences with the land. As such, some viewers may perceive the project setting as having high visual quality while others may perceive the area to have less visual quality.

The project is also shaped by a built environment, where existing infrastructure such as transmission line rights-of-way, highways, and county roads, referred to as "horizontal elements," are consistent throughout the project length. The project is located within a primarily agricultural landscape. There are four wind turbines located just south of the Rost Substation and east of the project and 350th Ave. As the project travels south from the Rost Substation along 350th Ave, there is an existing 69 kV transmission line approximately 450 feet away that the project parallels until 780th street. The Forks Switching Station is located southwest of the city of Lakefield. A 161 kV line crosses the project perpendicularly where the project connects to the Forks Switching Station. Figure 4-1 depicts the existing infrastructure around the Rost substation.

Figure 4-1 Existing Infrastructure Around the Rost Substation, Including the Existing Wind Turbines and 69 kV Transmission Line

The applicant's route was developed to avoid proximity to residences, with no residences located within the ROW. There are nine residences within 1,000 feet of the project, with the closest residences located between 50 and 250 feet of the alignment (Table 4-2). With respect to ROW sharing, the entire project parallels road ROW and field, parcel, or section lines for the entire route (Table 4-3).

Table 4-2 Proximity to Residences

Residences, Distance from Anticipated Alignment	Applicants' Proposed Route
Residences within 0-50 feet	0
Residences within 50-250 feet	4
Residences within 250-500 feet	2
Residences within 500-1,000 feet	3
Total Residences within 1,000 feet	9

Table 4-3 ROW Sharing and Paralleling

Infrastructure	Applicants' Proposed Route[1] Miles (percent)
Follows Existing Railroad	0 (0.0)
Follows Existing Roads	8.5 (100)
Follows Existing Transmission Line	0 (0.0)
Total – Follows Transmission Line, Road, or Railroad	8.5 (100)
Follows Field, Parcel, or Section Lines	8.5 (100)

[1]Portions may share or parallel more than one type of infrastructure ROW or division/boundary line, and therefore, the sum may be greater than 100 percent.

4.3.1.1 Impacts

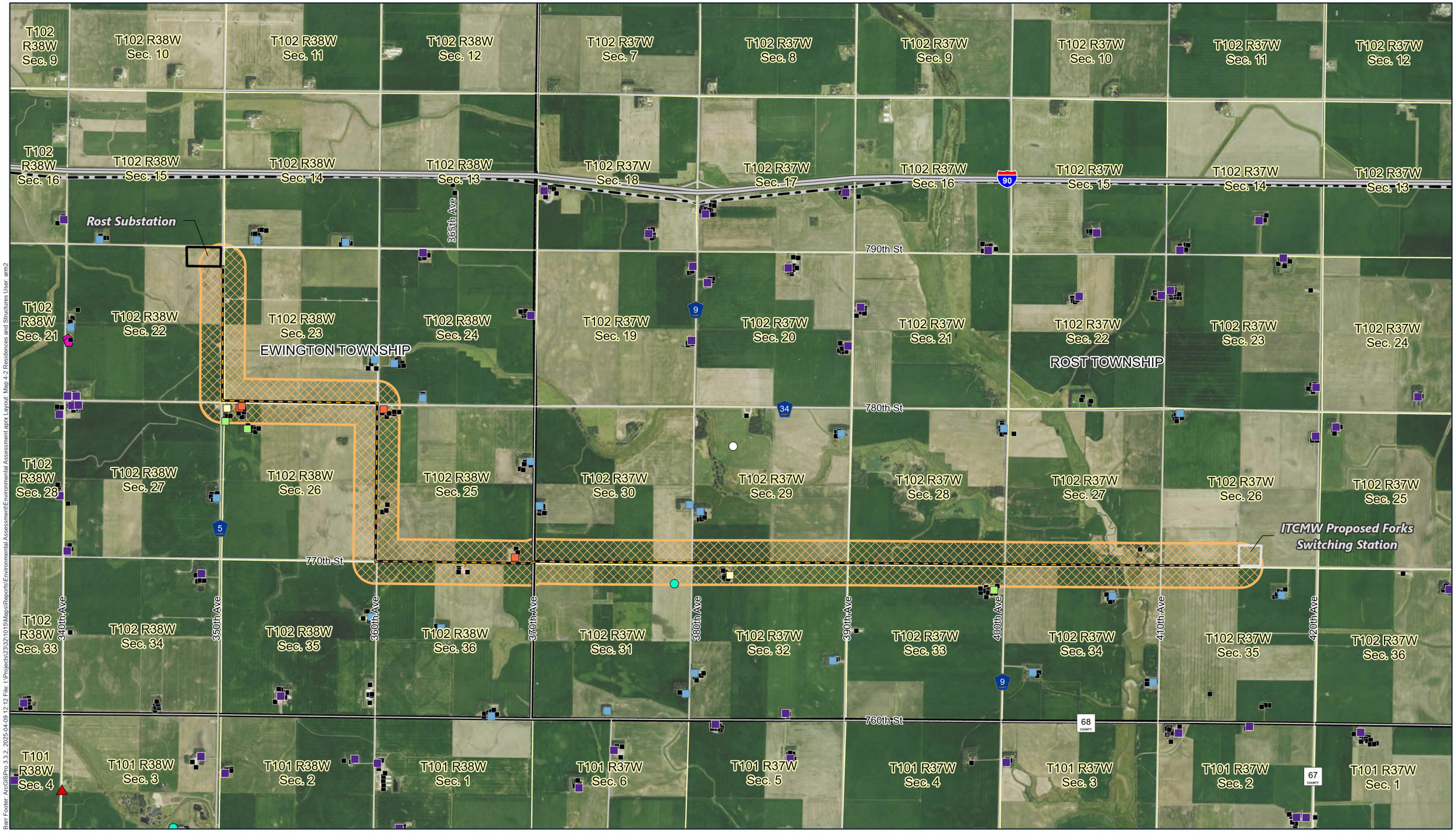
The project's transmission line structures and conductors would create aesthetic impacts. These impacts are anticipated to be minimal to moderate. The degree of these impacts depends on:

- Proximity to homes, schools, churches, etc., where relatively more observers are present to experience aesthetic impacts. Map 4-2 provides an overview of residences and other buildings near the route proposed for the project.
- The presence of terrain and vegetation that could shield views of the transmission line and the preservation of such vegetation.
- The types of structures and structure designs used for the project.
- Use of existing ROW where the project would have an incremental impact relative to existing human modifications to the landscape (i.e., putting like with like).

4.3.1.2 Mitigation Measures

The primary strategy for minimizing aesthetic impacts is prudent routing—that is, choosing routes where a transmission line is most harmonious with the landscape. The applicant has committed to minimizing permanent impacts to the aesthetics and visual character of the area by avoiding and/or minimizing tree clearing and avoiding residential areas to the maximum extent practicable. Other minimization and mitigation measures include:

- Maximizing ROW sharing with existing linear rights-of-way (e.g., roadways,) to minimize incremental aesthetic impacts.
- Using structures and structure designs that minimize impacts (e.g., use of uniform structure types to the extent practical).
- Using construction methods that minimize damage to vegetation near the transmission line.
- Placing structures to take advantage of existing natural screening to reduce the view of the line from nearby residences and roadways.
- Including specific conditions in individual easement agreements with landowners along the route (e.g., requiring new plantings or landscaping).



Barr Foster ArcGISPro 3.3.2, 2025-04-09 12:12 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-2 Residences and Structures User: amn2

- Applicant's Proposed Alignment
- Route Width (Proposed Route)
- Forks-Rost Project Area
- Commercial Aggregate
- Inactive Aggregate Source
- Out Building
- Church
- Junk yard

Residences by Distance from Alignment

- 50 - 250 Feet
- 250 - 500 Feet
- 500 - 1,000 Feet
- 1,000 Feet - 1 Mile
- > 1 Mile

0 3,000 6,000
Feet

Map 4-2

RESIDENCES AND STRUCTURES
Forks-Rost 161 kV Project

4.3.2 Property Values

Property values have the potential to be affected by the placement of nearby transmission lines. Prior research has found that potential impacts to property values due to transmission lines are generally connected to three main factors. First, how the transmission line affects the viewshed and aesthetics of a property. Second, potential buyers' concerns regarding electromagnetic fields (EMF). Third, effects on agricultural production and properties that are used for farming operations.

4.3.2.1 Impacts

A variety of methodologies have been used to research the relationship between transmission lines and property values. Some general conclusions can be drawn from this body of literature. This chapter highlights relevant outcomes of property value research, with additional detail provided in Appendix D.

Research does not support a clear cause-and-effect relationship between property values and proximity to transmission lines, but has revealed trends that are generally applicable to properties near transmission lines:

- When negative impacts on property values occur, the potential reduction in value is in the range of 1 to 10 percent.
- Property value impacts decrease with distance from the line; thus, impacts are usually greater on smaller properties than on larger ones (e.g., transmission lines can be set back farther from residences on larger parcels, transmission line easements take up a larger percentage of smaller parcels).
- Negative impacts diminish over time.
- Other amenities, such as proximity to schools or jobs, lot size, square footage of the home, and neighborhood characteristics, tend to have a greater effect on sale price than the presence of a transmission line.

The value of agricultural property decreases when transmission line structures interfere with farming operations.

4.3.2.2 Mitigation Measures

Property value impacts can be mitigated by minimizing aesthetic impacts, perceived EMF health risks, and agricultural impacts. This can be achieved by maximizing the use of existing ROW and placing the transmission line away from residences and out of agricultural fields. There is potential for impacts to be mitigated by including specific conditions in individual landowner easement agreements.

4.3.3 Zoning and Land Use

Zoning is a regulatory device used by local governments to geographically restrict or promote certain types of land uses. Minnesota statutes provide local governments with zoning authority to promote public health and general welfare.

This project is subject to Minnesota's Power Plant Siting Act (Minn. Statute 216E). Under this statute, the route permit issued for a transmission line:

…shall be the sole site or route approval required to be obtained by the utility. Such permit shall supersede and preempt zoning restrictions, building or land use rules, regulations or ordinances promulgated by regional, county, local and special purpose government.

Therefore, the applicant is not required to seek permits or variances from local governments to comply with applicable zoning codes. Nonetheless, impacts to local zoning are clearly impacts to human settlements, and the Commission considers impacts to human settlements as a factor in selecting transmission line routes.

The project would located in Ewington and Rost Townships in Jackson County, Minnesota. The closest city to the project is Lakefield, Minnesota. Ewington and Rost Townships fall under Jackson County's authority for zoning and ordinances. Land cover throughout the project consists of agricultural land (93.6 percent) and protected waters (6.4 percent). The Jackson County Comprehensive plan, established in 2010, contains the County's vision and future goals (reference (5)). The land use map in the comprehensive plan shows that, like the landcover data, the majority of the area is cultivated land, with scattered areas of farmsteads and rural residences, grasslands and deciduous forests.

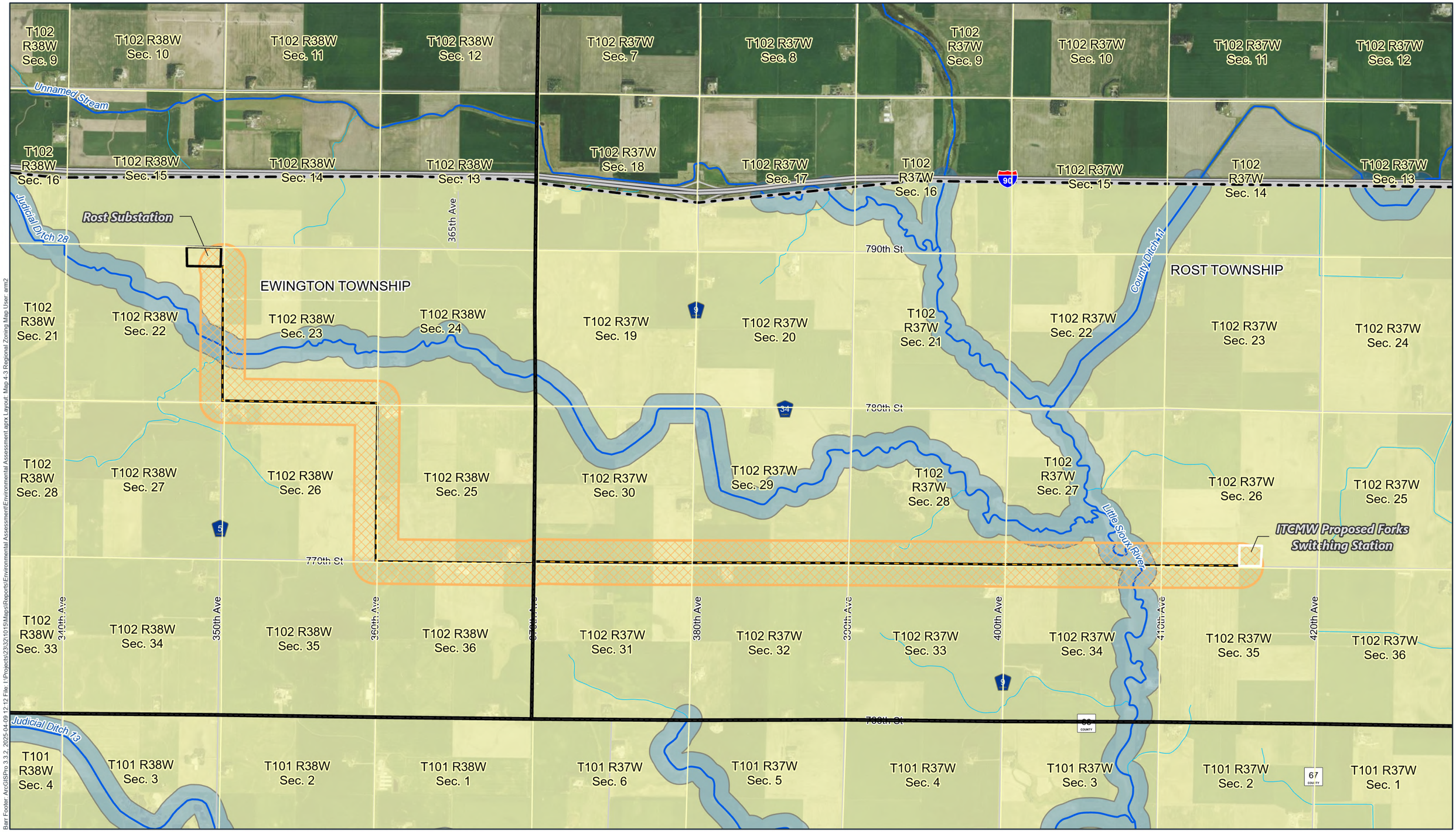
According to the Jackson County Zoning map, the project is in an area zoned agricultural. The project also crosses protected waters as defined by the shoreland zoning district (Map 4-3). According to the Jackson County Development Code adopted in September 1993 and last updated in 2024 (reference (6)), the purpose of the agricultural district is to preserve commercial agriculture as a viable, permanent land use and as a significant economic activity in the county. The purpose of the shoreland district is to preserve the water quality and natural characteristics of the shorelands and public waters in the County. Overhead electrical lines are considered essential services in the development code and are permitted within agricultural and tributary districts. Essential services buildings, like the Forks Switching Station, are considered a conditional use in the shoreland district and a permitted use in the agricultural district.

4.3.3.1 Impacts

Potential project impacts to local zoning are anticipated to be minimal, as the project is compatible with the agricultural and shoreland zoning throughout the project.

4.3.3.2 Mitigation Measures

Land use impacts can be mitigated by minimizing aesthetic impacts of the project, to the extent that zoning and land use plans address aesthetics (e.g., landscaping). The project will be co-located with road ROW for its entire length, which will limit change in land use. Although short term agricultural impacts may occur, these will be mitigated through restoration and/or compensatory payments to landowners. No other mitigation is proposed.



Barr Footer: ArcGISPro 3.3.2, 2025-04-09 12:12 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-3 Regional Zoning Map User: arm2

Applicant's Proposed Alignment
Route Width (Proposed Route)
Forks-Rost Project Area

Jackson County Zoning
Agriculture
Protected Waters

N

0 3,000 6,000
Feet

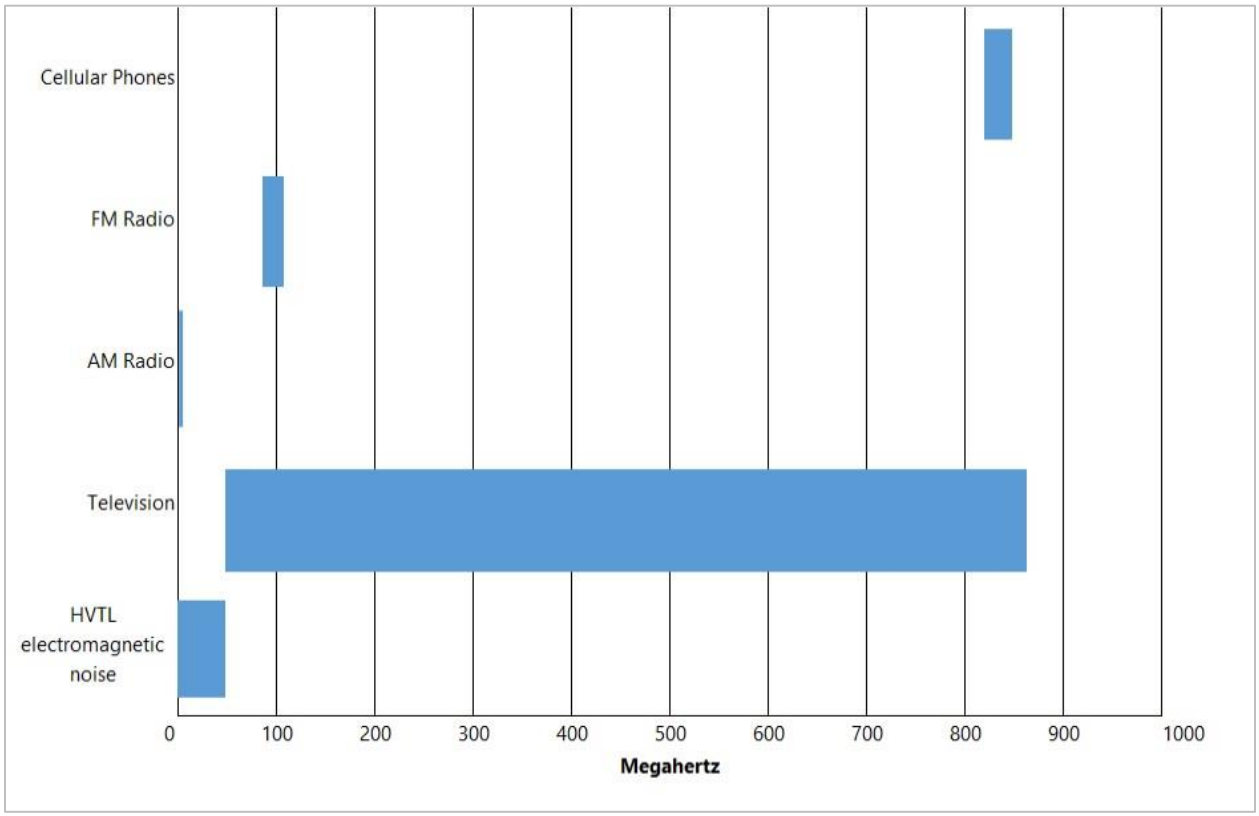
Map 4-3

REGIONAL ZONING
Forks-Rost 161 kV Project

4.3.4 Electronic Interference

Electronic interference refers to a disturbance in an electronic signal that can impair the proper functioning of an electronic device. Transmission lines do not generally cause interference with radio, television, cellular phone, global position systems (GPS), or other communication signals and reception. Information on medical electronic devices is discussed in Chapter 4.5.2. Figure 4-2 compares the spectrum of transmission frequencies for several communication and media signals to the peak intensity disturbance associated with electromagnetic noise from transmission lines. Additional discussion is provided below for each major type of media or communication signal.

Figure 4-2 Frequencies of Electronic Communications and of Electromagnetic Noise Created by Transmission Lines



Source: references (7); (8); (9)

Radio and Television

Generally, transmission lines do not cause interference with radio (amateur, commercial broadcasting, two-way radio services, etc.) or television (reference (10)). There are three potential sources for interference. These include gap discharges, corona discharges, and shadowing and reflection effects.

Gap discharge interference is the most noticed form of power line interference with radio and television signals and typically the most easily fixed. Gap discharges are usually caused by hardware defects or abnormalities on a transmission or distribution line causing small gaps to develop between mechanically connected metal parts. As sparks discharge across a gap, they create the potential for electrical noise, which can cause interference with radio and television signals. The degree of interference depends on the quality and strength of the transmitted communication signal, the quality of the receiving antenna

system, and the distance between the receiver and the power line. Gap discharges are usually a maintenance issue, since they tend to occur in areas where gaps have formed due to broken or ill-fitted hardware (clamps, insulators, brackets). Because gap discharges are a hardware issue, they can be repaired relatively quickly once the issue has been identified.

Corona from transmission line conductors can also generate electromagnetic noise at the same frequencies that radio and television signals are transmitted (Figure 4-2). The air ionization caused by corona generates audible noise, radio noise, light, heat, and small amounts of ozone (O_3). The potential for radio and television signal interference due to corona discharge relates to the magnitude of the transmission line-induced radio frequency noise compared to the strength of the broadcast signals. Because radio frequency noise, like EMF, becomes significantly weaker with distance from the transmission line conductors, very few practical interference problems related to corona-induced radio noise occur with transmission lines. In most cases, the strength of the radio or television broadcast signal within a broadcaster's primary coverage area is great enough to prevent interference.

If interference occurs for an AM radio station where good reception existed before the project was built, reception can be regained by adjusting or moving the receiving antenna system. Interference is unlikely to occur for AM radio frequencies, except for immediately under a transmission line, and interference would dissipate rapidly with increasing distance from the line.

FM radio receivers usually do not pick up interference from transmission lines because corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 Megahertz) (Figure 4-2). Also, the interference rejection properties inherent in FM radio systems make them fairly immune to amplitude type disturbances.

Because the United States has transitioned from analog to digital broadcasting, the potential for television interference from radio frequency noise is unlikely. Digital reception is considerably more tolerant of noise than analog broadcasts. Due to the higher frequencies of television broadcast signals (54 megahertz and above), a transmission line seldom causes reception problems within a station's primary coverage area. In the rare situation where the project may cause interference within a station's primary coverage area, the problem can usually be corrected with the addition of an outside antenna.

Shadowing effect comes from physically blocking communication signals and can impact two-way mobile radio communications and television signals. Television interference due to shadowing and reflection effects is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. In the rare situation where the project may cause interference within a station's primary coverage area, the problem can usually be corrected with the addition of an outside antenna. If television or radio interference is caused by or from the operation of the project, the applicant would evaluate the circumstances contributing to the impacts and determine the necessary actions to restore reception to the present level, including the appropriate modification of receiving antenna systems if necessary.

Internet and Cellular Phones

Wireless internet and cellular phones use frequencies in the 900 MHz ultra-high frequency (UHF) range—a range for which impacts from corona-generated noise are anticipated to be negligible. If internet service at a residence or business is provided by a satellite antenna, this service could be impacted by a line-of-sight obstruction. As with other satellite reception, any interference due to an obstruction could be resolved by moving the satellite antenna to a slightly different location.

Global Positioning Systems

GPS works by sending radio-frequency signals from a network of satellites to the receiver. Because of this, buildings, trees, and other physical structures have the potential to interfere with a GPS signal. Research has evaluated the potential for interference in the use GPS satellite-based microwave signals under or near power line conductors. Results of this research indicates it is unlikely that there will be electronic interference while using GPS (reference (11)). Interference will be more likely near a transmission line structure, and unlikely under a transmission line (reference(11)).

4.3.4.1 Impacts

No impacts to electronic devices are anticipated.

4.3.4.2 Mitigation Measures

Interference due to line-of-sight obstruction will be mitigated by prudent placement of transmission line structures and/or repositioning of electronic antennas as needed. Both cellular phone signals and GPS operate at frequencies outside the range of electromagnetic noise from transmission lines. If gap discharge interference occurs due to a hardware issue, the issue will be repaired and identified. In situations where interference with electronic devices does occur and is caused by the presence or operation of the project, the route permits issued by the Commission requires a permittee to take those actions which are feasible to restore electronic reception to pre-project quality (Appendix E).

4.3.5 Displacement

Displacement refers to the removal of a residence or building to facilitate the operation of a transmission line. For electrical safety code and maintenance reasons, utilities generally do not allow residences or other buildings within the ROW of a transmission line. Any residences or other buildings located within a proposed ROW are generally removed or displaced. Displacements are relatively rare and are more likely to occur in more populated areas where avoiding all residences and businesses is not always feasible.

Displacements can be avoided through several means, including structure placement, the use of specialty structures, and modifications of the ROW width. The applicant indicated in its route permit application that it is committed to working with the landowners to design adequate clearances from buildings, acquire the necessary easements, and address any landowner concerns. Though the general rule is that buildings are not allowed within the ROW of the transmission line, there are instances where the activities taking place in these buildings may be compatible with the safe operation of the line.

4.3.5.1 Impacts

There are no churches, schools, daycares, or nursing homes located within the project ROW. There are also no residential or non-residential structures (e.g., agricultural outbuildings or animal production structures) located within the project ROW.

4.3.5.2 Mitigation Measures

No impacts to residential or non-residential buildings are anticipated; therefore, no mitigation measures are proposed.

4.3.6 Noise

Noise is generally defined as unwanted sound. Noise levels are measured in units of decibel (dB) on a logarithmic scale and can be used to compare a wide range of sound intensities. Certain sound frequencies are given more weight since human hearing is not equally sensitive to all frequencies. The A-weighted decibel (dBA) scale accounts for the sensitivity of the human ear (Table 4-4). Due to the logarithmic dBA, a noise level of 70 dBA is approximately twice as loud as a 60 dBA sound to the average human hearing.

Table 4-4 Common Noise Sources and Levels

Sound Pressure Levels (dBA)	Common Indoor and Outdoor Noises
110	Rock band at 5 meters
100	Jet flyover at 300 meters
90	Chainsaw or gas lawnmower at 1 meter
85	Typical construction activities
80	Food blender at 1 meter
70	Vacuum cleaner at 3 meters
60	Normal speech at 1 meter
50	Dishwasher in the next room
40	Library
30	Bedroom
20	Quiet rural nighttime

Notes: Source: Minnesota Rules 7030.

The MPCA has developed protective standards for daytime and nighttime noise levels that vary based on land use at the location where the sound is heard (noise area classification, NAC). All project noises must be within the MPCA noise standards (Table 4-5). The noise standards are expressed as a range of permissible dBA over the course of a one-hour period; L50 is the dBA that may be exceeded 50 percent of the time within 1 hour, while L10 is the dBA that may be exceeded 10 percent of the time within one hour (Minn. Rule 7030).

Table 4-5 MPCA Noise Limits by Noise Area Classification

Noise Area Classification (NAC)	Daytime (dBA)L_{10}	Daytime (dBA)L_{50}	Nighttime (dBA)L_{10}	Nighttime (dBA)L_{50}
NAC 1: Residential and Other Sensitive Uses	65	60	55	50
NAC 2: Non-Residential Uses (retail, business and government services, recreational activities, transit passenger terminals)	70	65	70	65
NAC 3: Non-Residential Uses (manufacturing, fairgrounds and amusement parks, agricultural and forestry activities)	80	75	80	75

The project is primarily within agricultural zones (NAC-3), where maximum noise levels are currently caused by the movement and operation of farm equipment. Some portions of the project are near

residences (NAC-1). Noise receptors include residences and include individuals working outside or using recreational facilities along the project. For most of the project, ambient noise levels are in the range of 30 to 50 dBA, with temporary, higher noise levels associated with wind, vehicular traffic, and the use of gas-powered equipment (e.g., tractors, chain saws).

Community noise levels are usually closely related to the intensity of human activity. Noise levels are generally considered low when below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA (Table 4-4). In rural areas, noise levels can be below 35 dBA. In small towns or wooded and lightly used residential areas, noise levels are more likely to be around 50 to 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA tend to occur near major freeways and airports.

4.3.6.1 Impacts

Potential noise impacts from the project will occur from construction activities and operation of the transmission line and switching station.

Construction Noise

During project construction, temporary, localized noise from heavy equipment, such as pile drivers, and increased vehicle traffic is expected to occur along the ROW during daytime hours. Construction noise could temporarily affect residences, schools, businesses, libraries, parks, recreational areas, and related public spaces that are close to the ROW. Any exceedances of the MPCA daytime noise limits will be temporary in nature, and no exceedances of the MPCA nighttime noise limits are expected for the project.

Transmission Line Noise

Noise from transmission lines (electrical conductors) is due to small electrical discharges which ionize surrounding air molecules. The level of noise from these discharges depends on conductor conditions, voltage levels, and weather conditions. Noise emissions are greatest during heavy rain events (defined as more than one inch of rain per hour) when the conductors are consistently wet. However, during heavy rains, the background noise level is usually greater than the noise from the transmission line, and few people are in close proximity to a transmission line in these conditions. The applicant calculated project sound levels at the edge of the ROW for the transmission line. Table 4-6 shows the calculated sound level for the line.

Table 4-6 Calculated L50 Audible Noise (dBA) for Proposed Project

Structure Type	Line Voltage	Edge of ROW L_{50} Noise (dBA)
161 kV Single-Circuit Steel Monopole	161 kV	35.49

In foggy, damp, or light rain conditions, transmission lines may produce audible noise higher than background levels. During dry weather, noise from transmission lines is a perceptible hum and sporadic crackling sound. Noise levels are anticipated to be within Minnesota noise standards (i.e., < 50 dBA), and will only be perceptible when ambient noise levels in the project area fall below 40 dBA.

Switching Station

An analysis of the Forks Switching Station was conducted to examine potential noise levels due to the station. The only expected noise is the inconsistent, extremely short-term noise from planned switching or unplanned fault-clearing operations.

The Forks Switching Station will have three power lines terminating at this location. To analyze the average noise that will come from the switching station, data was gathered to find the average number of planned and unplanned switching events on the ITC Midwest 161 kV system. The applicant gathered data that 0.91 unplanned switching events and 3.71 planned switching events are anticipated to take place at the Forks Switching Station per year.

The applicant does not have measurements or vendor-provided specifications for audible noise produced by the circuit breaker or the disconnect switches, but the applicant's field experience has described these events as around 130 dBA. These noise events would be very brief and dissipate as distance increases from the switching station.

4.3.6.2 Mitigation Measures

Project noise impacts are anticipated to be minimal and within Minnesota's noise standards. The project will mitigate potential noise impacts by limiting construction to daylight hours and using construction equipment and vehicles with properly functioning mufflers and noise-control devices. Operational noise levels for the project are anticipated to be within state standards; however, the project will introduce a new noise source that, in certain situations (e.g., a calm evening) may be heard by nearby residents. Route permits issued by the Commission require compliance with Minnesota's noise standards.

4.3.7 Cultural Values

Cultural values are community beliefs and attitudes that provide a framework for community unity and guide community actions. Cultural values are informed, in part, by history and heritage. The project spans land that has been home to a diverse range of people and cultures. Major infrastructure projects can be inconsistent with an area's cultural values, resulting in a deterioration of a community's shared sense of self.

The project area was primarily populated by the Dakota Sioux people in the early to mid-1800s. By the mid-1800s, Canadian, French, and British fur traders began settling in this area. A large wave of European immigrants arrived around 1850; these settlers were primarily of German, Norwegian, Swedish, Dutch, and British heritage (reference (12)).

Cultural values are also influenced by the work and recreation of residents and by geographical features. The Project Area is primarily rural and agricultural. Farming and the ability to continue to farm and support livelihoods through farming tend to be strong values in these settings. Various recreational opportunities, such as hiking, hunting, and wildlife viewing, are supported by a variety of natural resources located in the Project Area, including the Little Sioux River and USFWS Waterfowl Production Areas (reference (13)).

4.3.7.1 Impacts

The project's impact on cultural values is anticipated to be minimal. The project will not adversely impact the work of residents that underlie the area's cultural values, nor is it anticipated to adversely impact geographical features that inform these values.

4.3.7.2 Mitigation Measures

Impacts to cultural values are anticipated to be minimal, and no mitigation measures are proposed.

4.3.8 Socioeconomics

Socioeconomic factors provide an indication of how economic activity affects and is shaped by social processes. Socioeconomic measures indicate how societies progress, stagnate, or regress because of their actions and interactions within and between the local, regional, or global economic scales. Transmission line projects contribute to growth and progress at the local level over time; therefore, socioeconomic impacts of the project are anticipated to be positive.

Table 4-7 shows the population and socioeconomic information for Ewington Township, Rost Township, Jackson County, and Minnesota for comparison using the American Community Survey 2023 5-year Estimates. As shown in Table 4-7, the project is located in a rural setting with all noted parameters falling below the state average, except for median household income and unemployment being relatively higher in Rost Township.

Table 4-7 Socioeconomic Census Data

Area	Minnesota	Jackson County	Ewington Township	Rost Township
Population	5,737,915	9,964	145	213
Population Density (population/sq. miles)	72	14.2	4.6	5.9
Labor Force	3,146,576	5,340	91	112
Labor Force Unemployment Rate (%)	2.1	1.6	0.0	2.6
Per Capita Income	$46,530	$39,494	$41,627	$42,468
Median Household Income	$85,086	$69,955	$49,792	$109,821

Source: reference (14)

Approximately 15 workers will be required for transmission line and substation construction. Transmission line construction is anticipated to begin in April 2026 with the full project in service in December 2026. Local businesses have the potential to experience short-term positive economic impacts through the use of the hotels, restaurants, and other services used by contractors during construction.

4.3.8.1 Impacts

The project would generate minor, short-term positive economic impacts, driven by increased construction activity and a small influx of contractor employees. The project will have some positive impacts on the socioeconomics of the region through the creation of temporary jobs, generation of tax revenue, and providing more reliable electrical service to the surrounding communities.

4.3.8.2 Mitigation Measures

No adverse socioeconomic impacts are anticipated; therefore, mitigation is not proposed.

4.3.9 Environmental Justice

Environmental justice (EJ) is the "just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in agency decision-making and other federal activities that affect human health and the environment (reference (15))." The goal of this fair treatment is to identify potential disproportionately high and adverse effects from implementation of the project and identify alternatives that may mitigate these impacts.

MPCA's Understanding Environmental Justice in Minnesota Mapping Tool (reference (16)) is an online mapping tool that uses census data to identify areas for meaningful community engagement and additional evaluation for disproportionate effects from pollution. The tool identifies Environmental Justice Communities (EJC) using the following four criteria, which aligns with the definition of an EJ area in Minn. Stat. 216B.1691, subdivision 1(e):

- 40 percent or more of the area's total population is nonwhite;
- 35 percent or more households in the area have an income that is at or below 200 percent of the federal poverty level;
- 40 percent or more of the area's residents over the age of five have limited English proficiency; or
- The area is located within Indian country, as defined in US Code, title 18, section 1151.

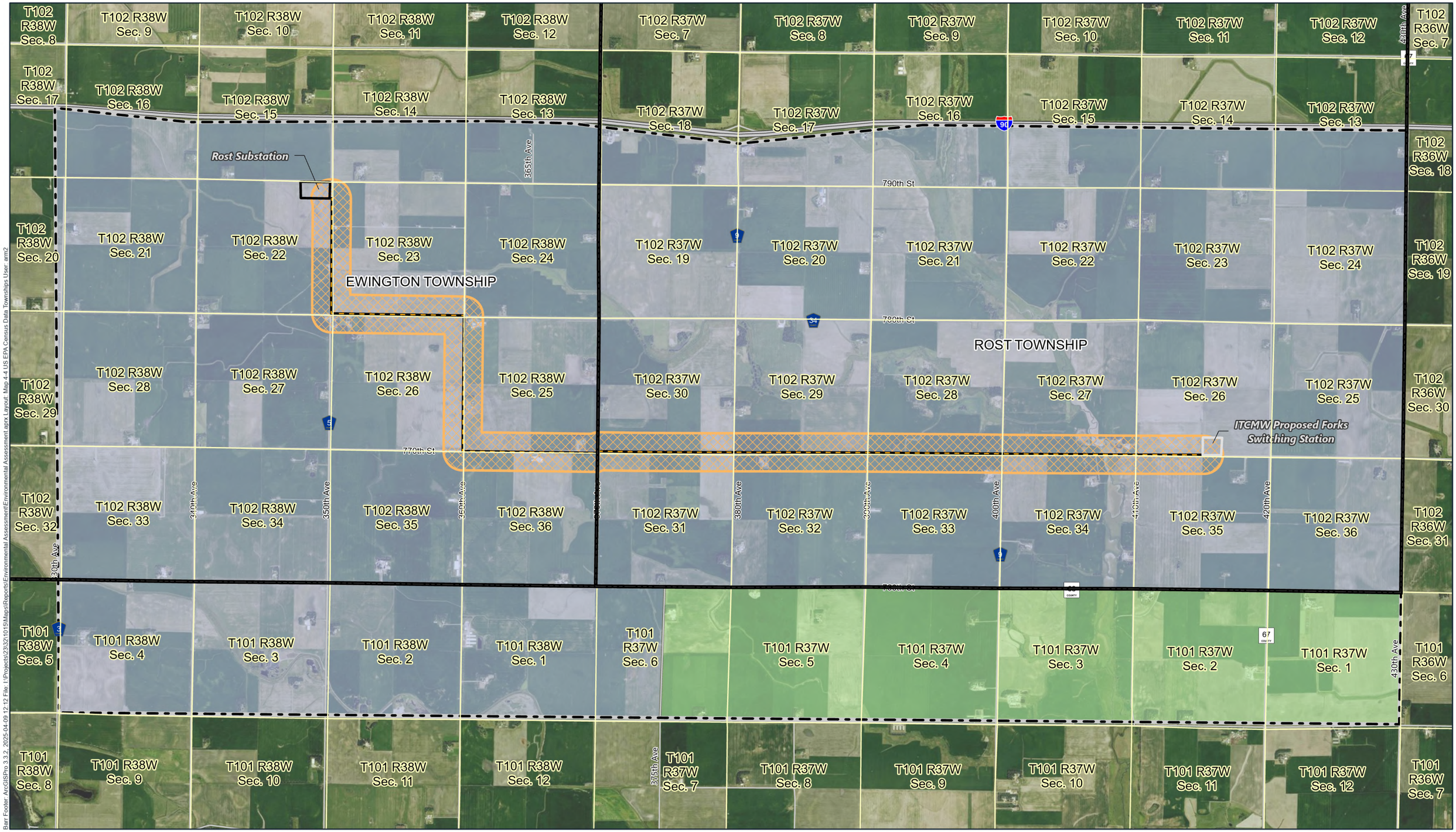
The MPCA mapping tool did not identify any EJCs in the project area.

The EJC definition guidelines from Minn. Stat. 216B.1691, subdivision 1(e) were used to review data from the American Community Survey 2023 5-year estimates. There are two census tracts located within the project area, census tracts 4802 and 4803 (Map 4-4). These census tracts would not be considered EJCs, according to Minn. Stat. 216B.1691 (Table 4-8).

Table 4-8 Population, Low-Income, and Minority Data

Area	Minnesota	Jackson County	Census Tract 4802	Census Tract 4803
Population	5,737,915	9,964	2,114	2,344
Percent Minority (2022)	23.3	9.6	13.5	6.3
Percent people at or below 200 percent of the Federal Poverty Level (2022)	9.3	9.1	7.3	7.1
Percent Limited English-speaking Households	2.2	1.2	2.9	0.9

Source: reference (14)



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Applicant's Proposed Alignment
Route Width (Proposed Route)
Forks-Rost Project Area
Census Tract 4802
Census Tract 4803
Civil Township

0 3,500 7,000
Feet

Map 4-4

MAP 4-4 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE
Forks-Rost 161 kV Project

4.3.9.1 Impacts

Due to the absence of EJCs in the project area, the project will not result in environmental justice impacts.

4.3.9.2 Mitigation Measures

No environmental justice impacts are anticipated; therefore, no mitigation is proposed.

4.4 Transportation and Public Services

Transmission line projects have the potential to negatively impact public services (e.g., roads, utilities, and emergency services). These impacts are typically temporary in nature (e.g., the inability to fully use a road or utility while construction is in process). However, impacts could be more long-term if they change the area so that public service options are foreclosed or limited.

This section summarizes the project's potential impacts on local roadways/railways, public utilities, emergency services, and airports and provides methods for mitigating these impacts. Temporary and long-term impacts to public services resulting from the project are anticipated to be minimal.

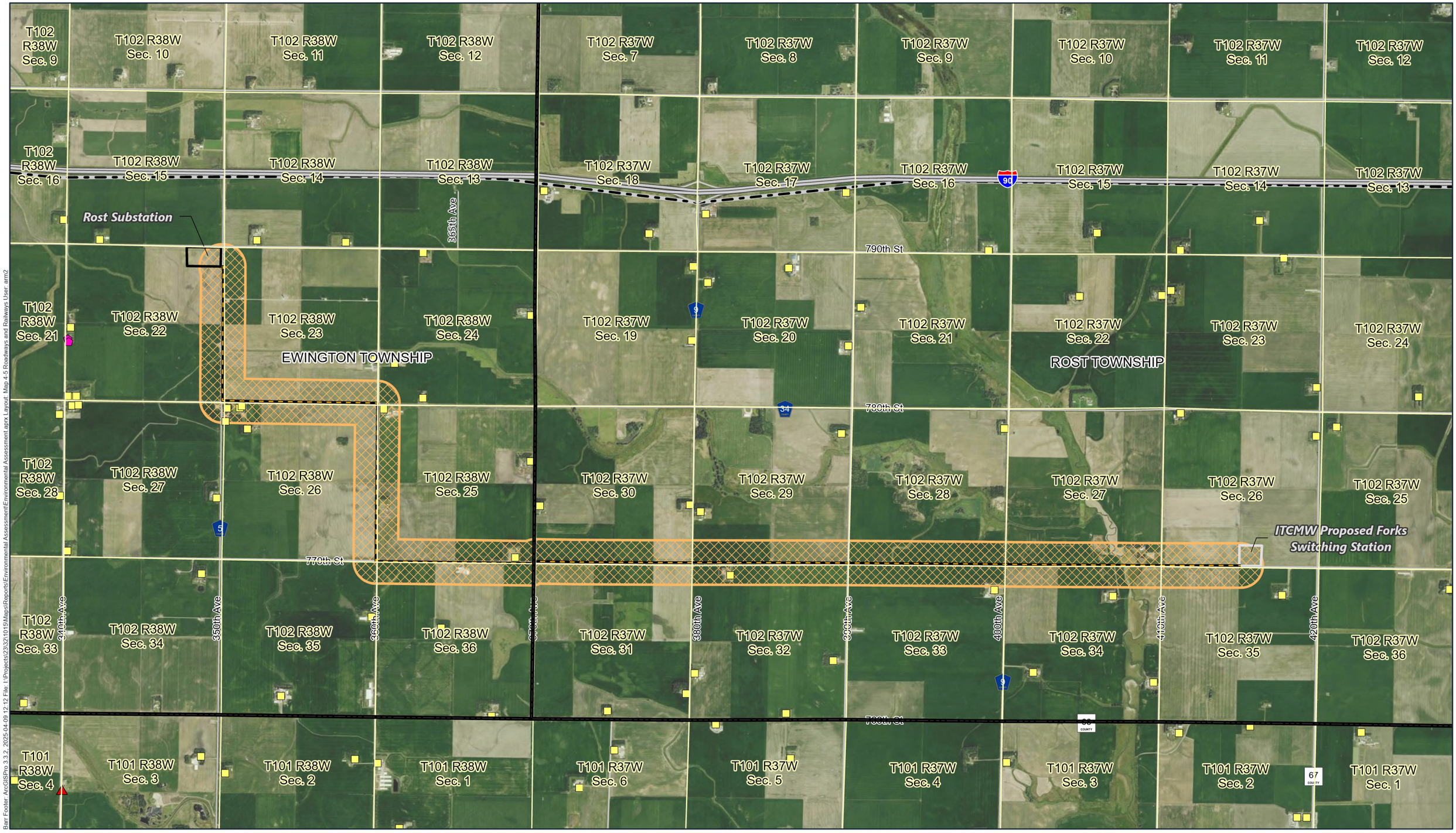
4.4.1 Roadways and Railways

The project is located in a primarily rural area. The project runs adjacent to multiple roadways and crosses roadways in ten locations. The project runs adjacent to the following roads:

- 350th Ave for approximately 0.85 miles
- 780th Street for approximately 1 mile
- 360th Avenue for approximately 1 mile
- 770th Street for approximately 5.5 miles

The project also intersects several local roads. The nearest major highway is Interstate 90, located approximately 0.6 miles north of the project (Map 4-5).

There are no passenger rail service or rail freight lines near the project.



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- Applicant's Proposed Alignment
- Route Width (Proposed Route)
- Forks-Rost Project Area
- Interstate
- Roads
- Residence
- Church
- Junk yard

0 3,000 6,000
Feet

Map 4-5

ROADWAYS AND RAILWAYS
Forks-Rost 161 kV Project

4.4.1.1 Impacts

Construction may occasionally cause lanes of roadways to be closed, although these closures will only last for the duration of the construction activity in a given area. Construction equipment and delivery vehicles will increase traffic along roadways throughout project construction, with effects lasting from a few minutes to a few hours, depending upon the complexity and duration of the construction activities. Drivers could experience increased travel times as a result. Construction vehicles could temporarily block public access to streets and businesses in cities.

The project could impact roadways and roadway users in several ways, including:

- Causing temporary traffic delays, detours, and congestion during construction.
- Interfering with future roadway expansions or realignments.
- Impairing the safe operation and maintenance of roadways.

Vehicles and equipment that will be used for the construction of the transmission line are generally heavier than passenger vehicles and may cause more damage to road surfaces. Oversized/overweight load permits must be obtained from the MnDOT when size and/or weight limits are exceeded.

Construction workers and construction-related vehicles using public roadways to access the transmission line ROW are likely to have localized adverse impacts on traffic volumes. Approximately 15 workers will be employed during construction. During the course of construction, workers will be dispersed throughout the project. Accordingly, the increase in vehicle traffic will represent a slight increase over existing traffic volumes at any given time and location.

Transmission lines that parallel roads could affect future road expansions or realignments because structures placed along the road ROW might need to be moved to preserve a safe distance between structures and the edge of the expanded roadway. The project will be co-located with road ROW for almost its entire length. The applicant will coordinate with Jackson County and Ewington and Rost Townships on road access permits and procedures, as well as utility permits and other road-related approvals, as needed. When stringing wire across a road, the applicant will install appropriate traffic control and safety devices, such as H-braces, signs, or flaggers. The applicant will work with Ewington and Rost Townships and Jackson County on appropriate safety measures.

The applicant indicates that the project's design standards meet the NESC requirements for safe design and operation of transmission lines. These standards include designing transmission lines to withstand severe winds from summer storms and the combination of ice and strong winds from winter weather.

No impacts to railways are anticipated as a result of the project.

4.4.1.2 Mitigation Measures

The increased traffic during construction is anticipated to be minor and temporary; therefore, no mitigation measures are proposed. Long-term impacts to transportation and public services are not anticipated, and mitigation measures are not required.

4.4.2 Public Utilities

The Federated Rural Electric Association (REA) provides electric utility services near the project. Natural gas services near the project are provided by Minnesota Energy Resources (reference (17)). A Northern Natural Gas pipeline intersects the project in two locations, once along 360th Avenue and once along 770th Street. The location of this pipeline and where it intersects with the project are shown on Map 4-6. Other typical public utilities are present, including cable, telephone, rural water, and private water wells.

4.4.2.1 Impacts

The project will not disturb any existing public utilities, and no impacts to public utilities are anticipated. No disruptions to electrical service are anticipated; however, an overarching project objective is to enhance electrical service in the area. The project will need to cross a buried Northern Natural Gas pipeline in two locations. This pipeline is also located within 1,000 feet of the project for approximately 9,060 feet (Map 4-6); however, no impacts to pipelines are anticipated as the project will span the pipeline crossings.

4.4.2.2 Mitigation Measures

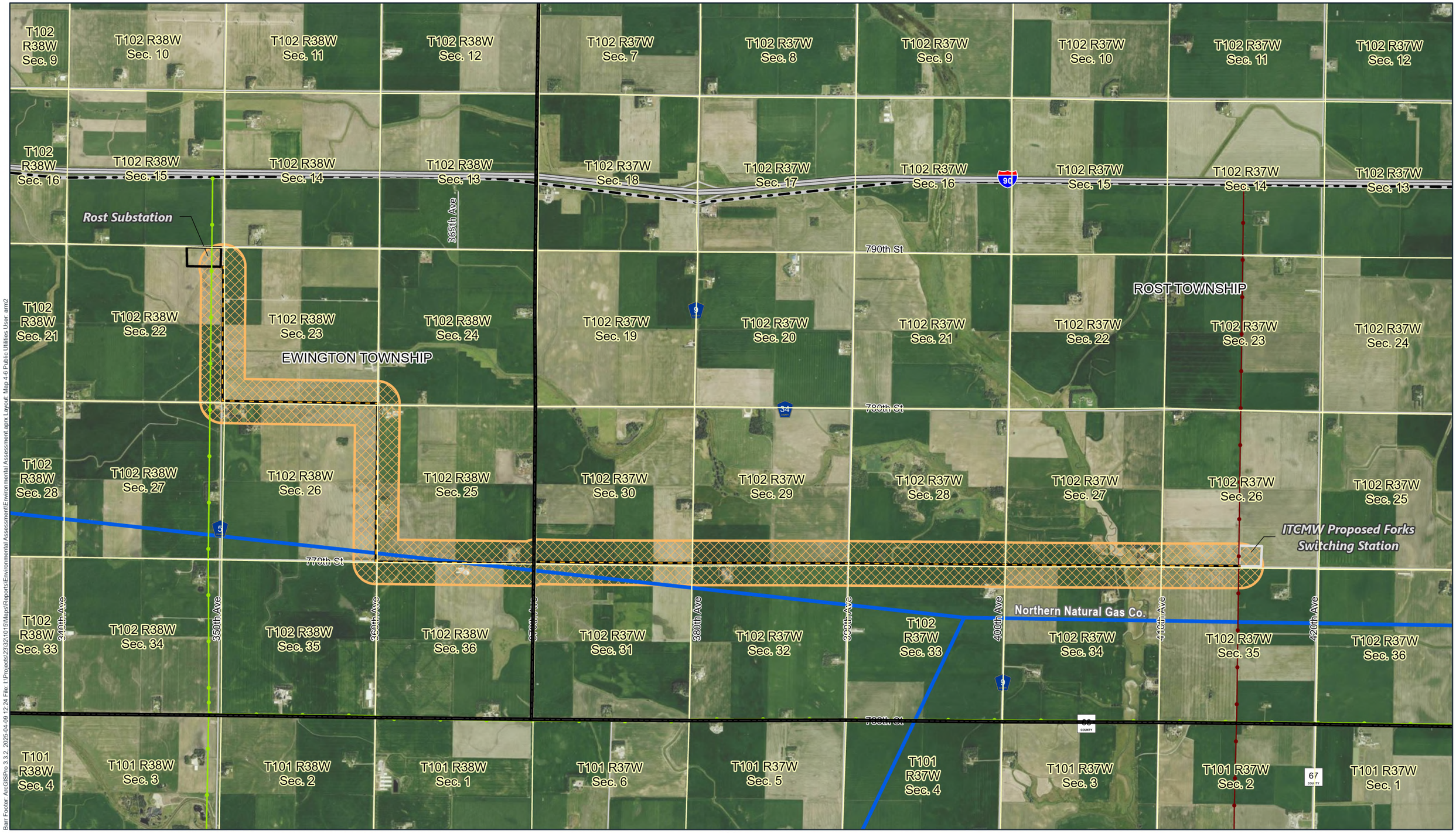
Potential project impacts to pipelines can be avoided and mitigated by spanning the pipeline crossings and coordination with the appropriate pipeline companies. The applicant indicates it will use the Gopher State One-Call system to locate and mark all underground utilities to avoid potential impacts.

4.4.3 Emergency Services

Emergency services in the region are provided by law enforcement and emergency response agencies of the local counties and communities. Sheriffs' offices and municipal police departments located in the surrounding area provide regional law enforcement. The Jackson County Sheriff's Department provides services to the project area. Additionally, the cities of Worthington and Jackson have local police departments that service the project area.

The project is located within Fire Region 13 – Southwest, and fire services for the area are provided by the Lakefield Fire Department, the Jackson City Fire Department, and the Worthington Fire Station (reference (18)).

Ambulance services are broken into Primary Service Areas (PSAs) which provide emergency medical response services throughout each PSA. The project area is located within the Sanford Worthington Jackson County PSA. Emergency medical response is also available from local hospitals, including Sanford Worthington Medical Center in Worthington, MN and Sanford Jackson Medical Center in Jackson, MN. The closest of these facilities is the Sandford Worthington Medical Center, located approximately 11 miles from the project (reference (19)).



Barr Foster ArcGISPro 3.3.2, 2025-04-09 12:24 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-6 Public Utilities User: arm2

- Applicant's Proposed Alignment
- Route Width (Proposed Route)
- Forks-Rost Project Area
- Interstate
- Roads
- Northern Natural Gas Pipeline

Exsisting Transmission Lines

- 34kV - 115kV
- 116kV - 500kV

0 3,000 6,000

Feet

Map 4-6

PUBLIC UTILITIES
Forks-Rost 161 kV Project

4.4.3.1 Impacts

The project is not anticipated to impact emergency services. Any temporary road closures required during construction will be coordinated with local jurisdictions to provide safe access for police, fire, and other emergency service vehicles. Any accidents that might occur during the project's construction will be handled through local emergency services. Given the limited number of construction workers involved in the project and the low probability of a construction-related accident, the current emergency services are expected to have ample capacity to address any potential emergencies that may occur during project construction.

4.4.3.2 Mitigation Measures

No impacts to emergency services are anticipated; therefore, no mitigation measures are proposed.

4.4.4 Airports

Transmission line structures and conductors can conflict with the safe operation of an airport if they are too tall and/or too close for the applicable safety zones. Different classes of airports have different safety zones depending on several characteristics, including runway dimensions, classes of aircraft they can accommodate, and navigation and communication systems (reference (20)). These factors determine the necessary take-off and landing glide slopes, which in turn determine the setback distance of transmission line structures.

FAA and MnDOT have each established development guidelines on the proximity of tall structures to public-use airports. Transmission lines near public airports are limited by FAA height restrictions, which prohibit transmission line structures above a certain height, depending on the distance from the specific airport. Private airstrips and personal use airstrips cannot be used for commercial transportation or by the general public and are, therefore, not subject to FAA regulatory obstruction standards (Minnesota Rules 8800.2400).

MnDOT has established separate zoning areas around airports. The most restrictive safety zones are safety zone A, which does not allow any buildings, temporary structures, places of public assembly, or transmission lines, and safety zone B, which does not allow places of public or semi-public, assembly such as churches, hospitals, or schools. Consistent with FAA regulations, MnDOT zoning requirements only apply to public airports (Minnesota Rules 8800.2400).

There are no FAA-listed airports, public airports, or private airports located within one mile of the project.

4.4.4.1 Impacts

There are no FAA airports, public airports, or private airports located within one mile of the project. As such, impacts to airports are not anticipated.

4.4.4.2 Mitigation Measures

No impacts to airports are anticipated; therefore, no mitigation measures are proposed.

4.5 Public Health and Safety

Transmission line projects have the potential to negatively impact public health and safety during project construction and operation. As with any project involving heavy equipment and transmission lines, there

are safety issues to consider during construction. Potential health and safety impacts include injuries due to falls, equipment use, and electrocution. Potential health impacts related to the operation of the project include health impacts from EMF, stray voltage, induced voltage, and electrocution.

4.5.1 Electric and Magnetic Fields

EMFs are invisible lines of force that surround electrical devices (e.g., power lines, electrical wiring, and electrical equipment) which are produced through the generation, transmission, and use of electric power. The term “EMF” is typically used to refer to EMF sources that are coupled together. However, for lower frequencies associated with power lines, EMF are relatively decoupled.

Electric fields are the result of electric charge, or voltage, on a conductor. The intensity of an electric field is related to the magnitude of the voltage on the conductor and is typically described in terms of kV per meter (kV/m). Magnetic fields are created and increase from the strength of the flow of current though wires or electrical devices. The intensity of a magnetic field is related to the magnitude of the current flow through the conductor and is typically described in units of magnetic flux density expressed as Gauss (G) or milliGauss (mG). Magnetic fields, unlike electric fields, are not shielded or weakened by materials that do not conduct electricity (e.g., trees, buildings). Rather, they pass through most materials.

Both magnetic and electric fields decrease rapidly with increased distance from the source. EMF are invisible just like radio, television, and cellular phone signals, all of which are part of the electromagnetic spectrum (reference). EMF are found anywhere there are energized, current-carrying conductors, such as near transmission lines, local distribution lines, substation transformers, household electrical wiring, and common household appliances (reference (21)).

4.5.1.1 Magnetic Field Background Levels

The wiring and appliances located in a typical home produce an average background magnetic field of between 0.5 mG and 4 mG (references (22); (23)). A U.S. government study conducted by the EMF Research and Public Information Dissemination Program determined that most people in the United States are on average, exposed daily to magnetic fields of 2 mG or less (reference (21)). Typical magnetic field strengths near common appliances are shown in Table 4-9.

Table 4-9 Typical Magnetic Field Strengths

Source	Distance from Source			
	0.5 foot	1 foot	2 feet	4 feet
	Typical Magnetic Fields (mG)			
Air Cleaners	180	20	3	0
Copy Machines	90	20	7	1
Fluorescent Lights	40	6	2	0
Computer Displays	14	5	2	0
Hair Dryers	300	1	0	0
Baby Monitor	6	1	0	0
Microwave Ovens	200	4	10	2

Source: reference (21)

4.5.1.2 Research on EMF and Health Impacts

Research on whether exposure to low frequency EMF causes biological responses and health effects has been performed since the 1970s. The U.S. National Institute of Environmental Health Sciences and the World Health Organization have been a part of this research. Their research does not support a relationship or association between exposure to electric power EMF and adverse health effects.

The U.S. National Institute of Environmental Health Science evaluated numerous epidemiologic studies and comprehensive reviews of the scientific literature that examined associations of cancers with living near power lines, with magnetic fields in the home, and with exposure of parents to high levels of magnetic fields in the workplace. They concluded that “no consistent evidence for an association between any source of non-ionizing EMF and cancer has been found” (reference (22)).

The states of Minnesota, Wisconsin, and California have also performed literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group to evaluate EMF research and to develop public health policy recommendations regarding EMF associated with high-voltage transmission lines. The Working Group included staff from a number of state agencies and published its findings in a White Paper on EMF Policy and Mitigation Options. They found that some epidemiological studies have shown no statistically significant association between exposure to EMF and health effects, and some have shown a weak association. The Working Group noted that studies have not been able to establish a biological mechanism for how EMF may cause health impacts.

Worldwide, the majority of scientific panels that have reviewed the research conducted to date conclude that there is insufficient evidence to establish a direct association between EMF and adverse health effects. Based on this work, the Commission has repeatedly found that “there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects” (reference (24)). Appendix F provides detailed background on EMF health impact research.

4.5.1.3 Regulatory Standards

There are currently no federal regulations regarding allowable electric or magnetic fields produced by transmission lines in the United States; however, a number of states have developed state-specific regulations (Table 4-10), and a number of international organizations have adopted EMF guidelines (Table 4-11).

The Commission has established a standard that limits the maximum electric field under transmission lines to 8 kV/m. All transmission lines in Minnesota must meet this standard. The Commission has not adopted a magnetic field standard for transmission lines. However, the Commission has adopted a prudent avoidance approach in routing transmission lines and, on a case-by-case basis, considers mitigation strategies for minimizing EMF exposure levels associated with transmission lines.

Table 4-10 State Electric and Magnetic Field Standards

State	Area where Limits Apply	Field	Limit
Florida	Edge of ROW	Electric	2 kV/m (lines ≤ 500 kV
		Magnetic	150 mG (lines ≤ 230 kV) 200 mG (> 230 kV- ≤ 500 kV) 250 mG (> 500 kV)
	On ROW	Electric	8 kV/m (≤ 230 kV) 10 kV/m (> 230 kV- ≤ 500 kV) 15 kV/m (> 500 kV)
Minnesota	On ROW	Electric	8 kV/m
Montana	Edge of ROW[1]	Electric	1 kV/m
	Road crossings	Electric	7 kV/m
New Jersey	Edge of ROW	Electric	3 kV/m
New York	Edge of ROW	Electric	1.6 kV/m
		Magnetic	200 mG
	Public road crossings	Electric	7 kV/m
	Private road crossings	Electric	11 kV/m
	On ROW	Electric	11.8 kV/m
Oregon	On ROW	Electric	9 kV/m

Notes: Source: reference (21)
[1]May be waived by landowner

Table 4-11 International Electric and Magnetic Field Guidelines

Organization	Electric Field (kV/m)		Magnetic Field (mG)	
	General Public	Occupational	General Public	Occupational
Institute of Electrical and Electronics Engineers	5	20	9,040	27,100
International Commission of Non-ionizing Radiation Protection	4	8	2,000	4,200
American Conference of Industrial Hygienists	1[1]	25	5[1]	20,000[1]
National Radiological Protection Board	10	20	830	4,200

Notes: Source: reference (25)
[1] For persons with cardiac pacemakers or other medical electronic devices

4.5.1.4 Impacts

The predicted electric field levels associated with the project are shown in Table 4-12. Values were calculated assuming minimum conductor-to-ground clearance at mid-span and a height of 1 meter (3.28 feet) above ground. The maximum calculated electric field for the project's configuration is 1.9 kV/m, directly underneath the conductors. This field level is within the Commission's 8 kV/m limit.

Because magnetic fields are dependent on the current flowing on the transmission line and therefore could vary throughout the day, the values in Table 4-13 are provided for two separate scenarios: average load and maximum rated load of the project. Values were calculated assuming minimum conductor-to-

ground clearance at mid-span and a height of 1 meter (3.28 feet) above ground. The maximum calculated magnetic field under maximum rated load is 40.1 mG. The maximum calculated magnetic field at the edge of the ROW (50 ft) is 10.9 mG.

There is no federal standard for transmission line electric or magnetic fields. The Commission has imposed a maximum electric field limit of 8 kV/m measured at 1 meter above ground for new transmission projects. All transmission lines in Minnesota must meet this standard. The Commission has not adopted a magnetic field standard for transmission lines. However, the Commission has adopted a prudent avoidance approach in routing transmission lines and, on a case-by-case basis, considers mitigation strategies for minimizing EMF exposure levels associated with transmission lines.

Table 4-12 Calculated Electric Fields (kV/M) for project (3.28 feet above Ground)

Structure Type (kV)	Voltage (kV)	Horizontal Distance from Pole Centerline (feet)												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
161 Single-Circuit Monopole	Nominal Voltage (161 kV)	0.012	0.026	0.11	0.201	0.431	0.903	1.931	1.291	0.348	0.183	0.114	0.03	0.013

Table 4-13 Calculated Magnetic Fields (mG) for the Project

Structure Type	Line Current per Phase (Amps)	Line Current (Amps)	Horizontal Distance (feet) from Pole Centerline												
			-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
161 kV Single Circuit Monopole	71.7	Average Load	0.086	0.19	0.67	1.1	2.2	5.2	10.7	7	2.9	1.4	0.84	0.21	0.094
	268	Maximum Rated Load	0.32	0.7	2.5	4.1	8.1	19.3	40.1	26.1	10.9	5.4	3.1	0.8	0.35

4.5.1.5 Mitigation Measures

No EMF impacts are anticipated for the project; therefore, no mitigation measures are proposed.

4.5.2 Implantable Medical Devices

Electromechanical implantable medical devices, such as cardiac pacemakers, implantable cardioverter defibrillators (ICDs), neurostimulators, and insulin pumps may be subject to interference from electromagnetic interference (EMI), which could mistakenly trigger a device or inhibit it from responding appropriately (reference (10)). While EMI can result in either inappropriate triggering or inhibition of a device from responding properly, only a small percentage of these occurrences are caused by external EMI. The American Conference of Governmental Industrial Hygienists (ACGIH) and ICD Manufacturer's recommended magnetic and electric field exposure limits are 1 g and 1 kV/m, respectively, for people with pacemakers (references (10, 26)). One gauss is five to 10 times greater than the magnetic field likely to be produced by a high-voltage transmission line (reference (10)).

4.5.2.1 Impacts

EMF exposure produced by transmission lines generally does not affect implantable devices, but in the event that they are affected it is typically a temporary asynchronous pacing. Electric and magnetic field levels decrease with distance; maximum electric fields at the edge of the ROW are anticipated to be less than 1 kV/m (Table 4-12). Maximum magnetic fields at the edge of the ROW are anticipated to be 10.9 mG (Table 4-13). Accordingly, impacts to implantable medical devices and their users are anticipated to be minimal. If a medical device is affected, the device will return to normal operation when the person moves away from the source of the EMF (reference (10)). Therefore, no adverse health impacts or permanent impacts on implantable medical devices are anticipated as a result of the project.

4.5.2.2 Mitigation Measures

Because no adverse health impacts or permanent impacts on implantable medical devices are anticipated as a result of the project, no mitigation measures are proposed.

4.5.3 Stray Voltage

Electrical systems that deliver power to end-users and electrical systems within the end-user's business, home, farm, or other buildings are grounded to the earth for safety and reliability reasons. The grounding of these electrical systems results in a small amount of current flow through the earth. Stray voltage could arise from neutral currents flowing through the earth via ground rods, pipes, or other conducting objects, or from faulty wiring or faulty grounding of conducting objects in a facility. Thus, stray voltage could exist at any business, house, or farm which uses electricity—independent of whether there is a transmission line nearby.

A small amount of current flows through the earth at points where utility distribution systems are grounded. This is called neutral-to-earth voltage (NEV), which is voltage that is associated with distribution lines and electrical wiring within buildings and other structures (reference (27)). Stray voltage is not created by transmission lines, as they do not directly connect to businesses or residences. Stray voltage is generally associated with electrical distribution lines and electrical service at a residence or on a farm. Site-specific mitigation measures may be required to address potential stray voltage impacts (reference (28)).

4.5.3.1 Impacts

No impacts due to stray voltage are anticipated from the project. Transmission lines do not create stray voltage as they do not directly connect to businesses, residences, or farms. The project will not directly connect to businesses or residences in the area and will not change local electrical service.

4.5.3.2 Mitigation Measures

If there are stray voltage concerns on a landowner's property or a landowner would like an on-site investigation, the applicant suggests they contact their electric service provider directly. The applicant has committed to coordinate with local companies to perform pre- and post-construction testing of potentially impacted facilities and to address property owner concerns if requested.

4.5.4 Induced Voltage

It is possible for electric fields from a transmission line to extend to a conductive object that is near a line. This may induce a voltage on the object; the magnitude of the voltage depends on several factors such as the size, shape, and orientation of the object along the ROW. Smaller conductive objects near the line could cause a nuisance shock to a person, but this nuisance shock is not a potential safety hazard. If there were insulated pipelines, electric fences, telecommunication lines, or other conductive objects with greater lengths and sizes, induced voltage from a transmission line could become unsafe to people who touch them; however, this still has not been found to be a health safety hazard (reference (29)).

4.5.4.1 Impacts

Minimal impacts due to induced voltage are anticipated from the project. Shocks from induced voltage from transmission lines are considered more of a nuisance than a danger. The transmission line will follow the NESC, which requires the steady-state (continuous) current between the earth and an insulated object located near a transmission line to be below 5 milliamps (mA) (reference (29)). In addition, the Commission limits electric fields to 8 kV/m to prevent serious hazard from shocks due to induced voltage under transmission lines (reference (30)). Any issued route permits have to meet the NESC standards and the Commission's electric field limit.

4.5.4.2 Mitigation Measures

Potential impacts from induction will be mitigated through the applicant's appropriate design measures, NESC standards, and Commission permit conditions.

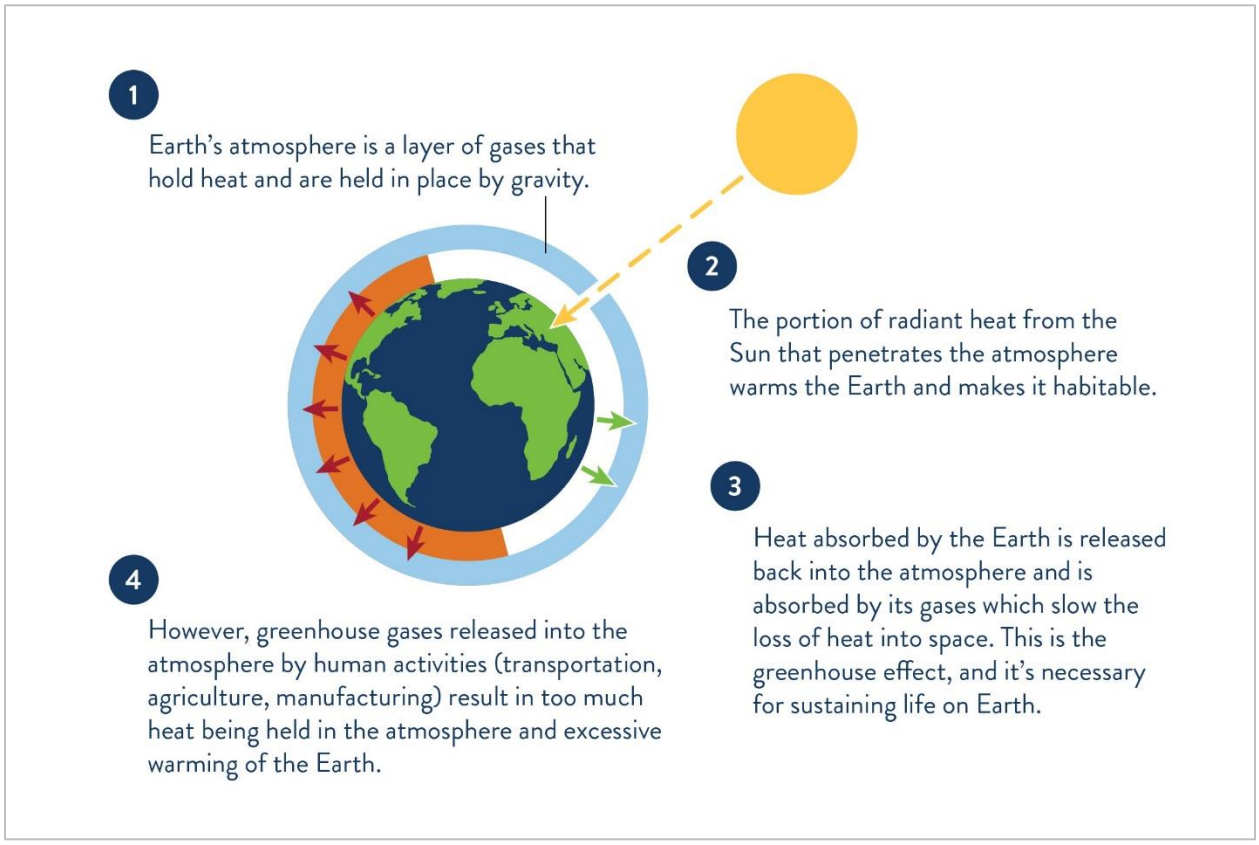
4.6 Climate Change

This section describes potential impacts of the project on climate change and the project's climate resilience.

4.6.1 Greenhouse Gases

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere. Some of the solar radiation that reaches Earth's surface radiates back toward space as infrared radiation. GHGs trap heat in the atmosphere from the absorption of this infrared radiation, which causes a rise in the temperature of Earth's atmosphere. This warming process is known as the greenhouse effect (reference (31)). This is illustrated below in Figure 4-3.

Figure 4-3 Greenhouse Effect



The most common GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. Anthropogenic GHG emissions are responsible for about two-thirds of the energy imbalance that is causing Earth's temperature to rise, which has direct and cascading effects on weather and climate patterns, vegetation, agriculture, disease, availability of water, and ecosystems (reference (32)).

The State of Minnesota has established a goal to reduce statewide greenhouse gas emissions across all sectors producing those emissions by at least the following amounts, compared with the level of emissions in 2005: (1) 15 percent by 2015; (2) 30 percent by 2025; (3) 50 percent by 2030; and (4) to net zero by 2050.

4.6.1.1 Impacts

GHG emissions associated with the construction and operation of the project consist of direct emissions generated from combustion sources (mobile off-road sources) and land use change.

Construction emissions from mobile combustion were calculated for construction equipment (dump trucks, cranes, bulldozers, etc.). Construction emissions from temporary land use changes were calculated with an assumed construction duration of nine months. Project construction is expected to produce 6,200.3 metric tons CO_2e, and the temporary land use change is expected to produce 47.69 metric tons CO_2e. Compared to the approximately 126.1 million metric tons CO_2e emitted statewide in 2022, the expected GHG emissions from the project's construction are expected to be minimal. GHG calculations are summarized in Appendix G.

Identified GHG emissions associated with operation of the project include direct emissions generated from combustion sources (mobile sources) and permanent land use changes where the Forks Switching Station will be constructed. Operational emissions from mobile combustion were calculated for inspection maintenance equipment assumed to be used annually (pickup trucks) and vegetation management equipment assumed to be used annually (bucket truck, skid steer mower, and chipper). Project operation and maintenance is expected to produce 1.88 metric ton CO_2e annually. Permanent land use change for the project includes the area of land converted to operate the Forks Switching Station. Permanent land use change is expected to produce 2.67 metric ton CO_2e annually. Permanent land use change from pole locations would be negligible. Small amounts of O_3 are produced from the operation of transmission lines through the ionization of air molecules during corona discharge. These emissions are anticipated to be minimal. Operational emissions from electrical consumption are expected to be negligible for the project.

Although project construction and operations would result in GHG emissions, the project is needed to optimize regional transfer capability as coal-fired generation ceases in Minnesota and significant renewable generation comes online in the upper Midwest. Thus, on whole, the project would assist in achieving the state's GHG reduction goals.

4.6.1.2 Mitigation Measures

Minimization efforts to reduce project GHG emissions may include efficient planning of vehicle and equipment mobilization and travel, vehicle idle time reduction, proper equipment upkeep, efficient planning of material delivery, proper use of power tools, use of battery powered tools when feasible, and alternative fuel vehicle usage when feasible.

4.6.2 Climate Resilience

Climate change is observed as change in temperature and precipitation patterns, increase in ocean temperatures and sea level, change in extreme weather events, and ecosystem change. These changes are largely attributed to the greenhouse effect. As the amount of GHGs in Earth's atmosphere increases, the greenhouse effect causes Earth to become warmer (reference (33)).

There are also naturally occurring climate variations. These are cyclical patterns caused by variations in ocean circulation and atmospheric pressure patterns that occur on timescales of weeks to decades. Increased global surface temperatures may change these natural climate patterns and the resulting impact on regional precipitation and temperature anomalies (reference(34)).

Warmer and wetter conditions have been observed in Minnesota since 1895, especially in the past several decades. An increase in precipitation and precipitation intensity has also been observed, including devastating, large-area, extreme rainstorms. A rise in temperatures, particularly during the winter season, has been occurring as well. These trends are expected to continue (reference (35)).

To understand how climate change is anticipated to affect the project location, historical and projected climate data is considered, as well as climate hazard projections. The DNR's Minnesota Climate Explorer tool provides a summary of historical climate data for various regions across Minnesota.

Figure 4-4 summarizes the mean, maximum, and minimum average daily temperature from 1895 to 2024 for Jackson County. It also shows the temperature trends per decade from 1895 to 2024 and from 1994 to 2024 to represent the full record of data and the most recent 30-year climate normal period, respectively. In each temperature statistic, the county exhibited an increase in daily temperature from

1895 to 2024. The annual average minimum daily temperature has increased at the largest rate of the three temperature statistics.

Figure 4-4 Historical Annual Mean, Maximum, and Minimum Daily Air Temperature (°F) for Jackson County, Minnesota from 1895 to 2024

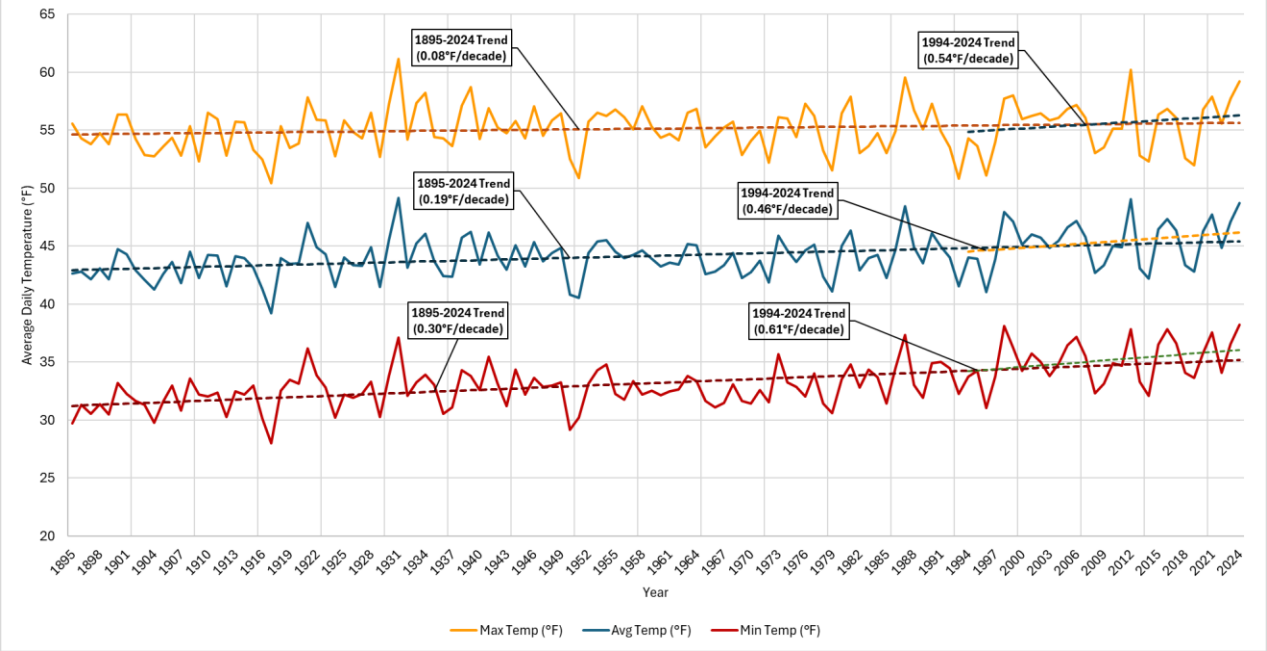
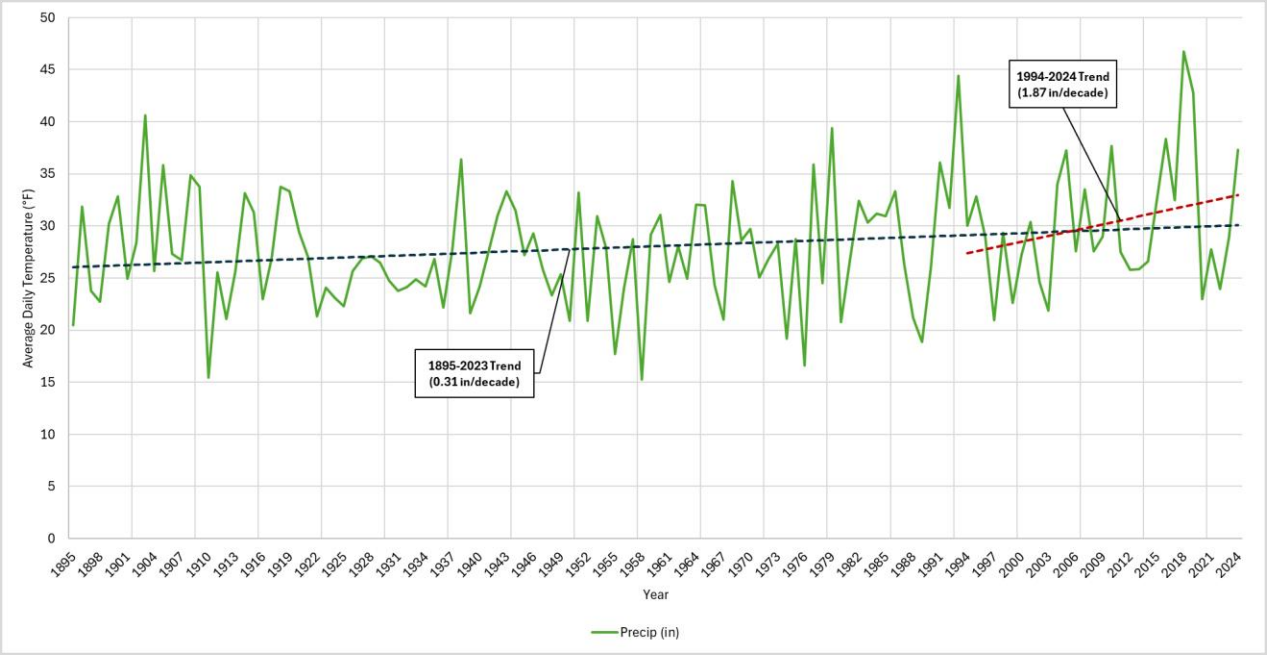


Figure 4-5 shows the total annual precipitation for Jackson County from 1895 to 2024. Total annual precipitation has increased from 1895 to 2024 by a rate of 0.31 in/decade and increased from 1994 to 2024 by a rate of 1.87 in/decade.

Figure 4-5 Historical Total Annual Precipitation (inches) for Jackson County, Minnesota from 1895 to 2024



Future projections are based on the Minnesota dynamically downscaled climate model data that was developed by the University of Minnesota (reference (36)) and are summarized in three scenarios, Shared Socioeconomic Pathway (SSP) 245, SSP370, and SSP585. SSP is a measure adopted by the Intergovernmental Panel on Climate Change (IPCC) to represent various GHG concentration pathways as well as social and economic decisions (reference (36)).

SSP245 represents an intermediate emission scenario where a net radiative forcing of 4.5 watts per meter squared (W/m^2) is received by the earth due to the GHG effect and emissions begin to decrease around 2040 (reference (37)). SSP370 represents a high emissions scenario, where a net radiative forcing of 7.0 W/m2 is received by the earth (reference (37)). SSP585 represents a very high emissions scenario, where a net radiative forcing of 8.5 W/m2 is received by the earth and no emissions are reduced through 2100 (reference (37)).

Table 4-14 shows the model historical and projected temperature values for the project. Under all scenarios for each statistic, temperature values are projected to increase through the end of the 21st century. The largest increases occur in the minimum daily temperature under all scenarios except SSP370 2040-2059 and SSP370 2060-2079, which saw the largest increases in the maximum daily temperature.

Table 4-14 Projected Average, Minimum, and Maximum Daily Temperatures for Jackson County, MN

Scenario	Time Period	Average Daily Temperature (°F) - Ensemble Mean	Minimum Daily Temperature (°F) - Ensemble Mean	Maximum Daily Temperature (°F) - Ensemble Mean
Historical	1995-2014	45.3	35.6	58.0
ssp245	2040-2059	49.0 (3.7)	39.4 (3.8)	61.6 (3.6)
ssp245	2060-2079	50.2 (4.9)	40.8 (5.1)	62.7 (4.7)
ssp245	2080-2099	51.9 (6.6)	42.3 (6.7)	64.5 (6.5)
ssp370	2040-2059	50.4 (5.1)	40.5 (4.9)	63.4 (5.4)
ssp370	2060-2079	52.5 (7.2)	42.6 (7.0)	65.3 (7.3)
ssp370	2080-2099	54.2 (8.9)	44.6 (9.0)	66.8 (8.8)
ssp585	2040-2059	49.6 (4.3)	40.0 (4.4)	62.2 (4.2)
ssp585	2060-2079	52.2 (6.9)	42.7 (7.1)	64.6 (6.6)
ssp585	2080-2099	56.4 (11.1)	47.2 (11.6)	68.6 (10.6)

Table 4-15 shows the model historical and projected precipitation values for the project. Under the SSP245, a slight increase in precipitation followed by a decrease in precipitation is projected. Under SSP370, a decrease in precipitation from modeled historical values is projected to occur under all time periods (largest occurring before 2060). For SSP585, a slight decrease in precipitation from modeled -+historical values is projected followed by a sharp increase in precipitation by the end of the century.

Table 4-15 Projected Annual Precipitation for Jackson County, MN

Scenario	Time Period	Total Annual Precipitation (in) - Ensemble Mean
Historical	1995-2014	31.2
ssp245	2040-2059	31.6 (0.4)
ssp245	2060-2079	32.0 (0.8)
ssp245	2080-2099	29.3 (-1.9)
ssp370	2040-2059	25.8 (-5.4)
ssp370	2060-2079	27.4 (-3.7)
ssp370	2080-2099	29.7 (-1.5)
ssp585	2040-2059	30.2 (-0.9)
ssp585	2060-2079	32.9 (1.7)
ssp585	2080-2099	33.3 (2.1)

The EPA Climate Resilience Evaluation and Awareness Tool (CREAT) provides general climate projections to help planning in water, wastewater, and stormwater utilities (reference (38)). For the project area, CREAT anticipates the 100-year storm intensity increasing from a value between 4.1 and 15.1 percent in 2035 to between 7.9 to 29.4 percent in 2060. The EPA Streamflow Projections Map

summarizes general projections related to streamflow under climate change (reference (39)). The EPA Streamflow Projections Map anticipates a general change in average streamflow of streams within the project area by a ratio of 1.30 to 1.40 (90th percentile) under wetter projections and a ratio of 0.94 to 1.00 (10th percentile) under drier projections in 2071 to 2100 (RCP 8.5) compared to baseline historical flow (1976 to 2005).

4.6.2.1 Impacts

Changes in temperature, precipitation, and extreme weather events are expected to occur over the lifetime of the project. Temperature and precipitation are generally expected to increase, with extreme weather events becoming more frequent. High temperatures can affect the sagging of a transmission line and its thermal tolerance. Changes in storm timing and intensity can lead to compromised structure foundations. Increased storm intensity and high winds can lead to compromised conductors and damaged structures.

4.6.2.2 Mitigation Measures

The project will be designed for resiliency under changing climatic factors such as increased temperatures and changes in intensity and timing of storm events and associated precipitation, as well as in accordance with NERC reliability standards. Additional mitigation measures are not proposed.

4.7 Air Quality

The Clean Air Act (CAA) is a federal law that regulates air emissions from stationary and mobile sources. The CAA requires the U.S. Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, referred to as “criteria pollutants”. The six criteria pollutants are ground-level ozone, particulate matter (PM_{10}/$PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead (Pb) (reference (40)). NAAQS are set to address the public health and welfare risks posed by certain widespread air pollutants (references (41); (42)). Compliance with the national and state air quality standards in the state of Minnesota is assessed at the county level. The EPA designates Jackson County to be in attainment for all NAAQS.

In Minnesota, air quality is monitored using stations located throughout the state. The MPCA uses data from these monitoring stations to calculate the Air Quality Index (AQI) on an hourly basis for O_3, $PM_{2.5}$, SO_2, NO_2, and CO. Each day is categorized based on the pollutant with the highest AQI value for a particular hour (reference (43)).

The project area is located nearest to the Emmetsburg, Iowa Lakes Community College air quality monitor in Palo Alto County, IA, located approximately 45 miles southeast of the project area. This station monitors for O_3 and $PM_{2.5}$. A summary of days in each AQI category at the Emmetsburg, Iowa Lakes Community College for the most recent five-year period available, covering 2024-2020, is provided in Table 4-16.

Table 4-16 Days in Each Air Quality Index Category – Emmetsburg, Iowa Lakes Community College

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2024	218	84	0	0	0
2023	211	135	14	4	0
2022	271	94	0	0	0
2021	250	108	2	2	0
2020	273	93	0	0	0

Air quality at this monitoring station has generally been considered good for the majority of the past five reported years. Since 2020, 2023 had the largest number of days classified as moderate or worse. In 2023, 142 days were classified as moderate, 14 days were classified as unhealthy for sensitive groups, and four days were classified as unhealthy.

4.7.1 Impacts

Air emissions during construction will primarily consist of emissions from construction equipment and will include pollutants such as CO_2, nitrogen oxides (NO_X), $PM_{2.5}$, and PM_{10}. Dust generated from earth disturbing activities also gives rise to particulate matter. Emissions from construction vehicles could be minimized by using modern equipment with lower emissions ratings. Adverse effects on the surrounding environment are expected to be negligible due to the temporary disturbance during construction and the intermittent nature of the emission- and dust-producing construction phases.

During operation of the transmission line and Forks Switching station, air emissions will be minimal. Small amounts of NO_X will be produced from the operation of the transmission line through ionization of air molecules during corona discharge. These emissions are expected to be minimal. A small amount of ozone will be created due to corona from the operation of transmission lines. The emission of ozone during operations is not anticipated to have a significant impact on the environment (reference (44)).

4.7.2 Mitigation Measures

If construction activities generate problematic dust levels, the applicant may employ construction-related practices such as wetting of unpaved roads and exposed or barren ground to control fugitive dust. Additionally, cleared rights-of way, storage areas, and access roads would be restored and revegetated once construction is complete, limiting further dust production during operation.

During operations, air emissions will be minimal. Small amounts of emissions will be associated with the intermittent project operation and maintenance activities via mobile combustion and roadway dust generation. If dust levels become problematic during operation and maintenance activities, the applicant may employ fugitive dust control practices such as wetting of unpaved roads.

4.8 Land-Based Economies

The project's construction and operation have the potential to impact land-based economies. Transmission lines are a physical, long-term presence on the landscape which could prevent or otherwise limit the use of land for other purposes. When placed in an agricultural field, transmission line structures

have a relatively small footprint, yet they can interfere with farming operations. In addition, structures and tall growing trees are not allowed in transmission line ROW.

Elements of land-based economies include agriculture, forestry, mining, and recreation and tourism, which are discussed in more detail in the following sections.

4.8.1 Agriculture

Agriculture is prevalent throughout the project area (Map 4-7). There are a total of 55.5 acres of agriculture land within the ROW, which equates to 54.4 percent of the total land cover within the ROW (Figure 4-6).

Figure 4-6 Typical Land Use Within the Project ROW

The USDA Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database (reference (45)) identifies farmland soils based on three categories, which are subject to protection under the Farmland Protection Policy Act (FPPA). These categories include prime farmland, prime farmland when drained, and farmland of statewide importance. Prime farmland is defined by the NRCS as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. A total of 100.12 acres within the ROW have soil that is characterized as prime farmland, farmland of statewide importance, or prime farmland if drained, which equates to 98.09 percent of the agriculture land within the ROW (Map 4-8).

In addition, there are 11.8 acres of agricultural land within the Forks Switching Station siting area. Within the Forks Switching Station siting area, 5.5 acres are classified as prime farmland and 6.3 acres are classified as prime farmland if drained (Map 4-8).

According to the Minnesota Natural Resource Atlas (reference (46)), Minnesota Department of Agriculture (MDA) organic farm directory (reference (47)), and the MDA apiary registry (reference (48)), there are no Conservation Reserve Enhancement Program (CREP) enrolled lands, registered organic producers, or apiaries within the ROW.

4.8.1.1 Impacts

The project has the potential to impact agriculture both temporarily and permanently. Temporary impacts typically include impacts from transmission line construction and annual transmission line inspections. Localized construction impacts will cease once the transmission line construction phase is complete. Temporary impacts from annual transmission line inspections will be limited to the ROW and areas where obstructions may require off ROW access. These temporary impacts may result in the displacement of livestock or impacts to crops and soil.

Permanent transmission line impacts result from the placement of transmission line structures within agricultural fields. Permanent structures can have varying sized footprints due to the structure design and distance from each another, See Table 3-1 for the proposed structure design for the project. Examples of permanent impacts resulting from transmission line structures include restriction of farming equipment, interference with aerial spraying, and obstruction of irrigation systems. In addition, the Forks Switching Station will permanently impact up to 2.8 acres of land previously used for agriculture. These impacts can result in financial impacts through loss of income and decreases in property values.

4.8.1.2 Mitigation Measures

Impacts to agricultural operations have been minimized by proposing a project that primarily follows existing roadway ROW. The applicant will work with landowners to minimize the impact on agricultural activities. The following mitigation measures are proposed:

- To the extent practicable, construction will be scheduled during periods when agricultural activities will be minimally affected.
- Local roads will be used as much as possible to move equipment and install structures. If local roads cannot be used, equipment will be limited to the ROW to the full extent. If movement outside the ROW is required, permission from landowner’s will be obtained.
- All temporary workspace required to construct the project will be leased from landowners through agreements.
- All material and debris during construction will be removed and properly disposed of.
- Landowners will be compensated for any crop damage, crop loss, and/or soil compaction.
- All areas disturbed during construction will be repaired and restored to pre-construction conditions. In addition to agricultural fields, this may include fences, gates, ditches, terraces, roads, or other features.

T102 R38W
Sec. 15

T102 R38W
Sec. 14

T102 R38W
Sec. 13

Rost Substation

T102 R38W
Sec. 22

EWINGTON
TOWNSHIP

T102 R38W
Sec. 23

T102 R38W
Sec. 24

T102 R38W
Sec. 27

T102 R38W
Sec. 26

T102 R38W
Sec. 25

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- Applicant's Proposed Alignment
- Right of Way
- Route Width (Proposed Route)
- Residence
- Out Building

National Land Cover Dataset (NLCD, 2021)

- 21 Developed, Open Space
- 22 Developed, Low Inensity
- 23 Developed, Medium Inensity
- 24 Developed, High Intensity
- 31 Barren Land
- 43 Mixed Forest
- 82 Cultivated Crops

0 650 1,300
Feet

Map 4-7
Page 1 of 5
LAND COVER
Forks-Rost 161 kV Project

T102 R38W
Sec. 27

T102 R38W
Sec. 26

EWINGTON
TOWNSHIP

T102 R38W
Sec. 25

T102 R38W
Sec. 34

T102 R38W
Sec. 35

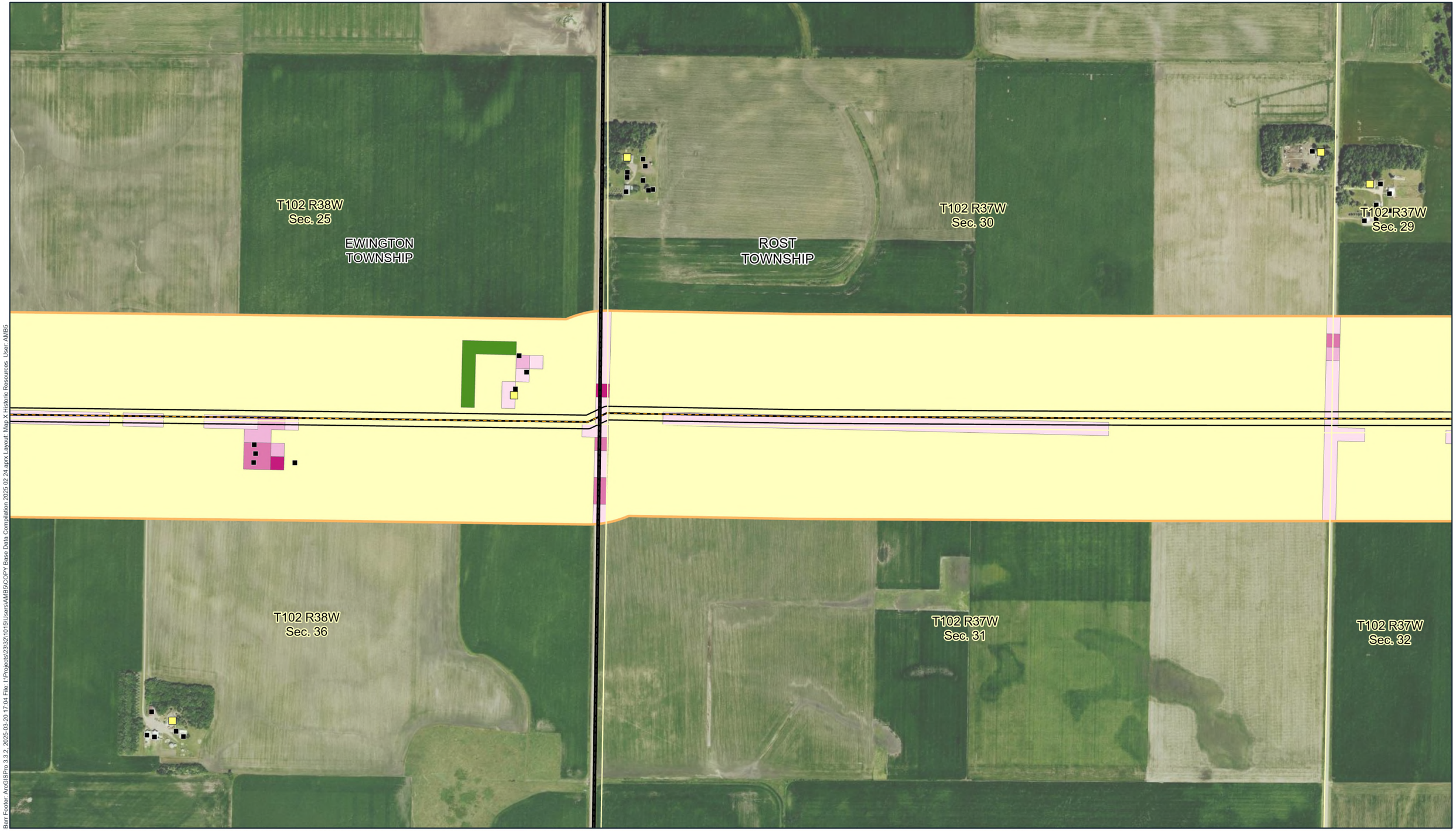
T102 R38W
Sec. 36

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

National Land Cover Dataset (NLCD, 2021)
21 Developed, Open Space
22 Developed, Low Inensity
23 Developed, Medium Inensity
24 Developed, High Intensity
31 Barren Land
43 Mixed Forest
71 Herbaceous
82 Cultivated Crops

0 650 1,300
Feet

Map 4-7
Page 2 of 5
LAND COVER
Forks-Rost 161 kV Project



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- Applicant's Proposed Alignment
- Right of Way
- Route Width (Proposed Route)
- Residence
- Out Building

National Land Cover Dataset (NLCD, 2021)

- 21 Developed, Open Space
- 22 Developed, Low Inensity
- 23 Developed, Medium Inensity
- 24 Developed, High Intensity
- 43 Mixed Forest
- 82 Cultivated Crops

0 650 1,300
Feet

Map 4-7
Page 3 of 5
LAND COVER
Forks-Rost 161 kV Project

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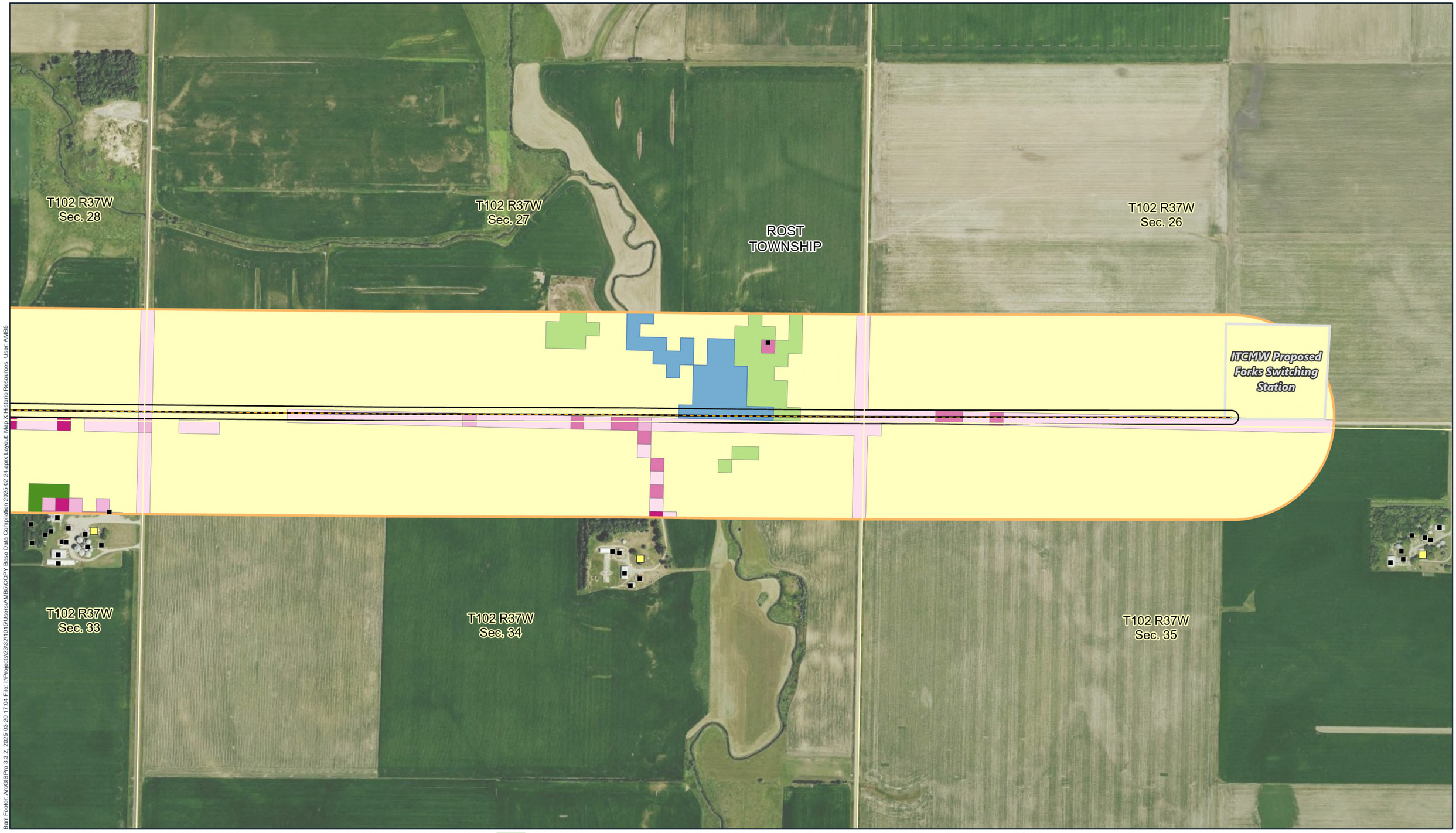
- Applicant's Proposed Alignment
- Right of Way
- Route Width (Proposed Route)
- Residence
- Out Building

National Land Cover Dataset (NLCD, 2021)

- 21 Developed, Open Space
- 22 Developed, Low Inensity
- 23 Developed, Medium Inensity
- 24 Developed, High Intensity
- 43 Mixed Forest
- 71 Herbaceous
- 82 Cultivated Crops

0 650 1,300
Feet

Map 4-7
Page 4 of 5
LAND COVER
Forks-Rost 161 kV Project



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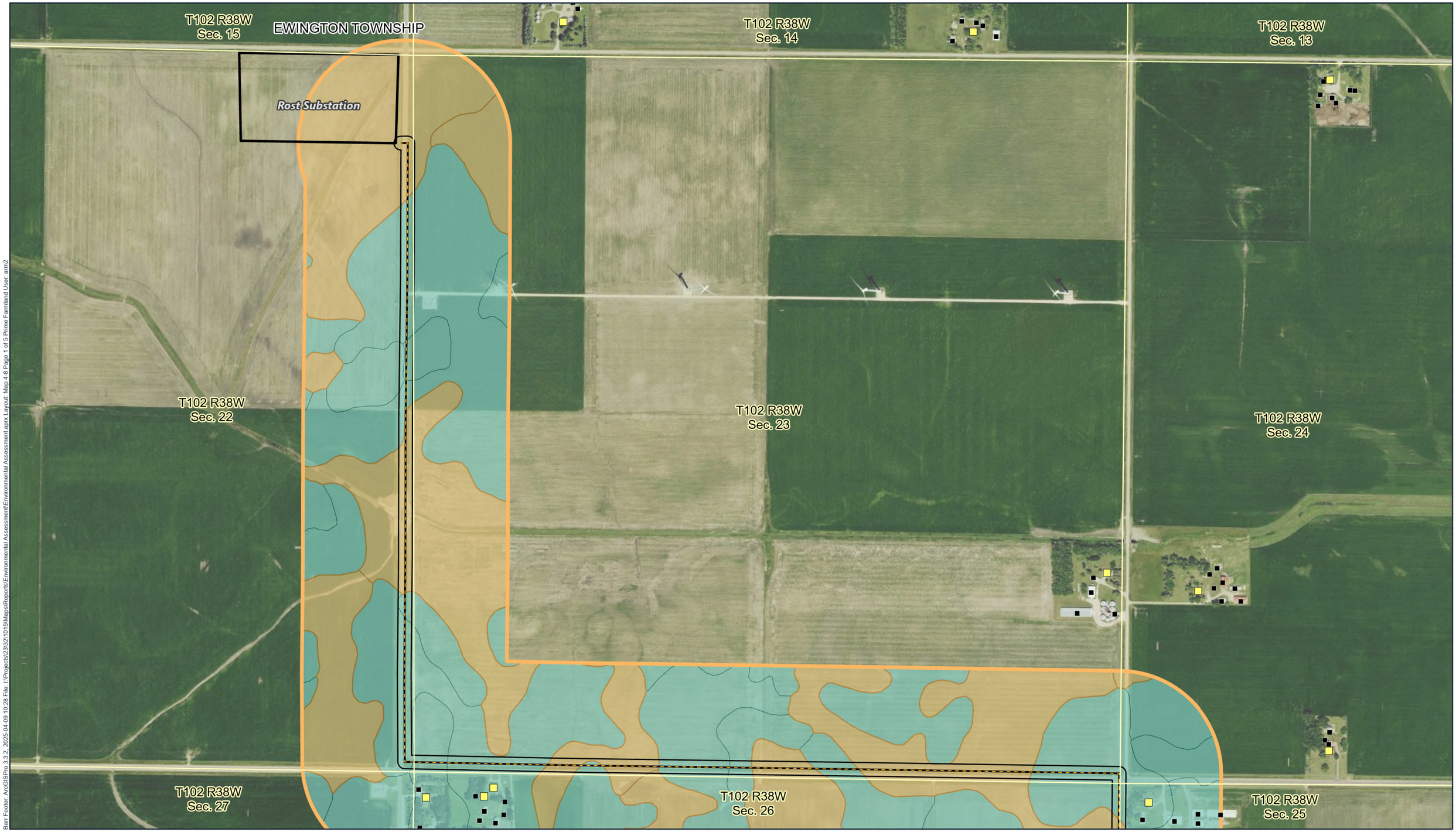
Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

National Land Cover Dataset (NLCD, 2021)
21 Developed, Open Space
22 Developed, Low Inensity
23 Developed, Medium Inensity
24 Developed, High Intensity
43 Mixed Forest
71 Herbaceous
82 Cultivated Crops
95 Emergent Herbaceous Wetlands

0 650 1,300
Feet

Map 4-7
Page 5 of 5
LAND COVER
Forks-Rost 161 kV Project



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Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

SSURGO Soils Farmland Classification
All areas are prime farmland
Prime farmland if drained

N

0 650 1,300
Feet

Map 4-8
Page 1 of 5
PRIME FARMLAND
Forks-Rost 161 kV Project

T102 R38W
Sec. 27

T102 R38W
Sec. 26

EWINGTON
TOWNSHIP

T102 R38W
Sec. 25

T102 R38W
Sec. 34

T102 R38W
Sec. 35

T102 R38W
Sec. 36

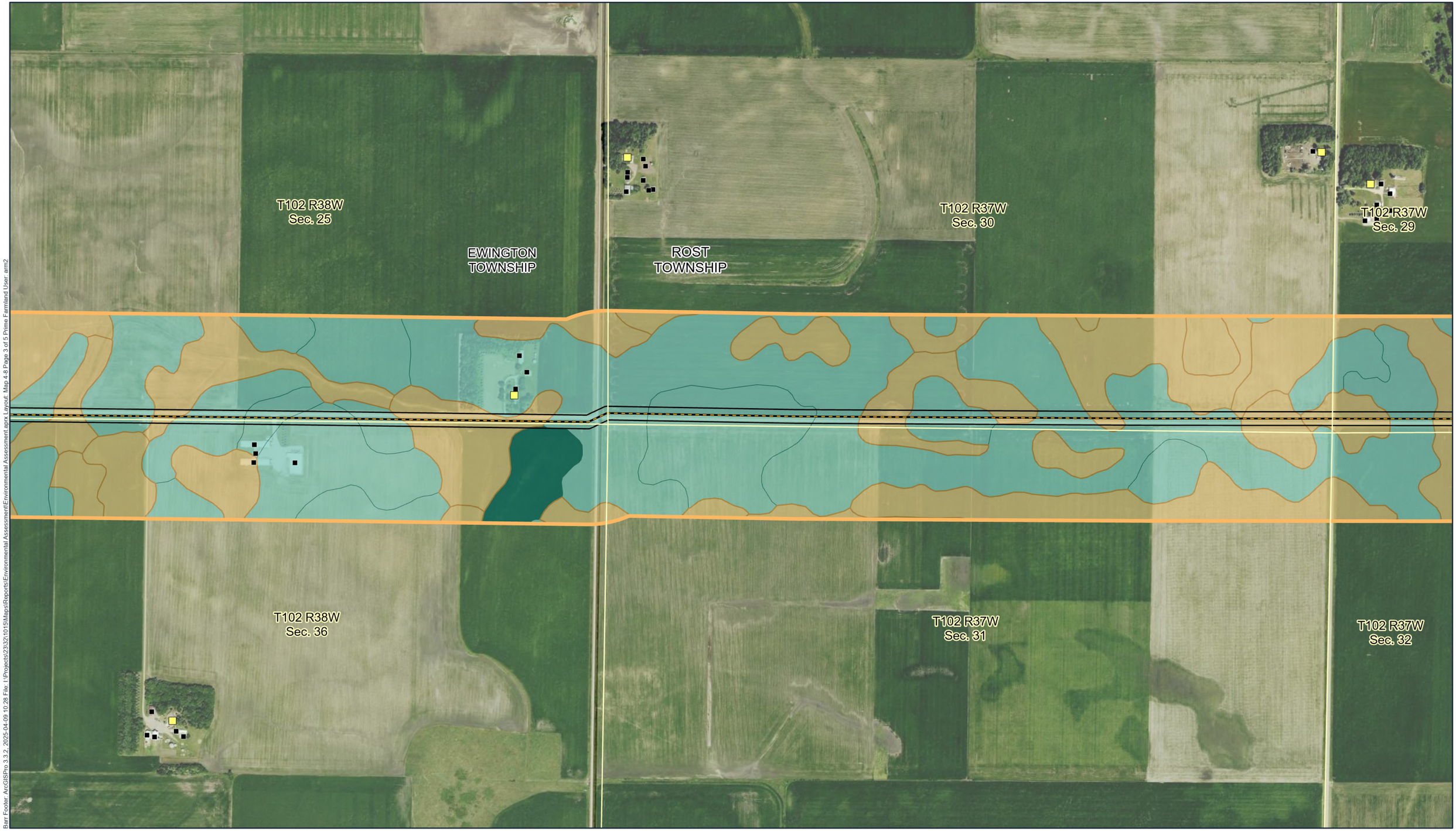
Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

SSURGO Soils Farmland Classification
Farmland of statewide importance
All areas are prime farmland
Prime farmland if drained

N

0 650 1,300
Feet

Map 4-8
Page 2 of 5
PRIME FARMLAND
Forks-Rost 161 kV Project



Barr Footer: ArcGISPro 3.3.2, 2025-04-09 10:28 File: I:\Projects\23\321015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-8 Page 3 of 5 Prime Farmland User: arm2

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

SSURGO Soils Farmland Classification
Farmland of statewide importance
All areas are prime farmland
Prime farmland if drained

0 650 1,300
Feet

Map 4-8
Page 3 of 5
PRIME FARMLAND
Forks-Rost 161 kV Project

T102 R37W
Sec. 30

T102 R37W
Sec. 29

ROST
TOWNSHIP

T102 R37W
Sec. 28

T102 R37W
Sec. 31

T102 R37W
Sec. 32

T102 R37W
Sec. 33

T102
R37W
Sec. 34

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

SSURGO Soils Farmland Classification
All areas are prime farmland
Prime farmland if drained

N

0 650 1,300
Feet

Map 4-8
Page 4 of 5
PRIME FARMLAND
Forks-Rost 161 kV Project

Barr Footer: ArcGISPro 3.3.2, 2025-04-09 10:28 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-8 Page 5 of 5 Prime Farmland User: arm2

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Residence
Out Building

SSURGO Soils Farmland Classification
Farmland of statewide importance
All areas are prime farmland
Prime farmland if drained
Not prime farmland

0 650 1,300
Feet

Map 4-8
Page 5 of 5
PRIME FARMLAND
Forks-Rost 161 kV Project

4.8.2 Forestry

Minnesota's forests primarily consist of aspen/birch, spruce/fir, and oak/hickory forest types, which are managed by private/tribal industry (44 percent), state government (24 percent), federal government (17 percent), and counties/municipalities (15 percent) (reference (49)). As of 2020, Minnesota's forest products industry was the state's fifth largest manufacturing sector by employment and provided 64,500 jobs (reference (49)). In 2017, Minnesota's forest products industry produced $17.8 billion of shipment value (gross sales) and provided 8.5 percent of all manufacturing payroll employment.

Timber harvested in Minnesota is used for construction materials, paper products, and heating for homes, among other commercial goods. Additionally, timber harvested from private commercial forest lands is primarily used in the manufacturing of paper products.

According to the DNR forest inventory, there are no forested lands or commercial forestry operations within the ROW.

4.8.2.1 Impacts

For safe operation of the project, trees and other tall-growing vegetation must be removed from the transmission line ROW. Vegetation clearing typically consists of initial vegetation clearing and minor tree removal before construction and on-going maintenance within the ROW following construction.

Due to the absence of known forested lands or forestry operations in the ROW, impacts to forestry resources are not anticipated as a result of the project.

4.8.2.2 Mitigation Measures

Since impacts to forestry resources are not anticipated, mitigation is not proposed.

4.8.3 Mining

Mining is a significant industry in Minnesota, with mining operations classified into two categories: metallic minerals and non-metallic minerals (reference (50)). Metallic minerals consist of materials such as iron ore, copper, and nickel, while non-metallic minerals consist of materials such as aggregate, peat, and kaolin clay. Aggregate materials are used in construction activities and usually consist of raw materials such as sand, gravel, and crushed stone. There are no known mining operations documented in the ROW (Map 4-2).

4.8.3.1 Impacts

Since there are no known mining operations documented in the ROW, no impacts to mining are anticipated as a result of the project.

4.8.3.2 Mitigation Measures

Since impacts to mining are not anticipated, mitigation is not proposed.

4.8.4 Recreation and Tourism

Tourism and recreational activities commonly overlap; the difference between the two is the distance traveled to access these opportunities. Recreational activities are generally located within the vicinity of

one's home and easily accessible, while tourism involves activities that require substantial travel and may incur additional expenses as a result.

Tourism within Jackson County includes farm and home shows, town and county days, the Jackson County Fair, gold events, holiday parades, and fireworks. Tourism destinations include Fort Belmont, Jason Speedway, the Historic State Theatre, Jackson County Historical Society Museum, and the Round Lake Vineyards and Winery.

In addition, the Rost Waterfowl Production Area (WPA) and the Ulbricht WPA (Map 4-9) provide recreational activities such as hiking, hunting, and wildlife viewing.

There are no Aquatic Management Areas, Wildlife Management Areas (WMAs), Scientific and Natural Areas, golf courses, county parks or trails, local parks or trails, scenic byways, snowmobile trails, state forests, state parks, or State Game Refuges located within the project area.

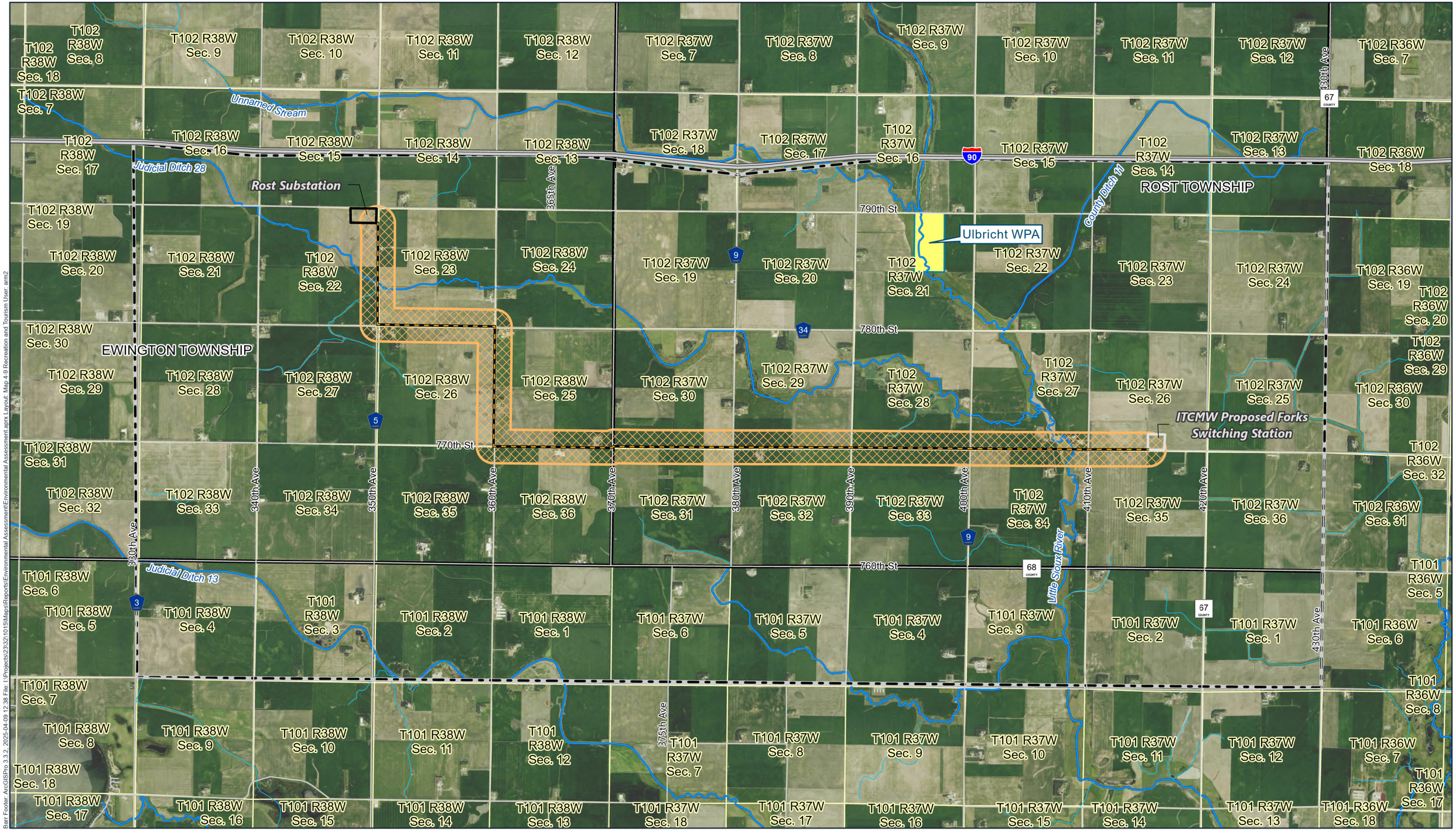
4.8.4.1 Impacts

Project impacts on recreation and tourism are anticipated to be minimal and temporary in nature, lasting only for the duration of construction. Short-term disturbances, such as increased noise and dust, could detract from nearby recreational activities and could, depending on the timing, affect hunting by temporarily displacing wildlife. However, wildlife is expected to return to the area once construction has been completed.

The Rost and Ulbricht Waterfowl Production areas are both located more than one mile from the ROW; therefore, no notable impacts to recreation and tourism are anticipated as a result of the project.

4.8.4.2 Mitigation Measures

Since no impacts to recreation and tourism are anticipated, mitigation is not proposed.



Applicant's Proposed Alignment
Route Width (Proposed Route)
Forks-Rost Project Area
Waterfowl Production Area (WPA)

0 0.75 1.5
Miles

Map 4-9

RECREATION AND TOURISM
Forks-Rost 161 kV Project

4.9 Archaeological and Historic Resources

Archaeological resources are defined as the material remains of past human life or activities (reference (51)). Pursuant to the Minnesota Historic and Architectural Survey Manual (reference (52)), historic resources are defined as sites, buildings, structures, or objects that are over 45 years in age and "create tangible links to the American past, whether in relation to historical events and people, traditional ways of life, architectural design, or methods of construction" (reference (53)).

Federal laws and regulations, including Section 106 of the National Historic Preservation Act of 1966 (Section 106) and the Archaeological Resources Protection Act of 1979, provide the standards for cultural resources identification, evaluation, and mitigation of impacts. Pursuant to Section 106, significant archaeological and/or historic resources (i.e., historic properties) are those resources that are included or eligible for inclusion in the National Register of Historic Places (NRHP). If the Project were to become a federal undertaking, it would be subject to Section 106 requirements.

The project is also subject to the Minnesota Historic Sites Act (Minn. Statutes 138.661 to 138.669) and the Field Archaeology Act (Minn. Statutes 138.31 to 138.42), and the Minnesota Private Cemeteries Act (Minn. Stat. §307.08). The Minnesota Historic Sites Act (Minn. Statutes 138.661 to 138.669) requires that state agencies consult with the SHPO before undertaking or licensing projects that may affect properties on the State or National Registers of Historic Places. The Minnesota Field Archaeology Act (Minn. Statutes 138.31 to 138.42) establishes the position of State Archaeologist and requires State Archaeologist approval and licensing for any archaeological work that takes place on non-federal public property.

Under the Minnesota Private Cemeteries Act (Minn. Statutes 307.08), when human burials are known or suspected to exist in a project area, the landowner or developer must submit construction and development plans to the Office of the State Archaeologist (OSA) for their review before the plans are finalized and prior to any disturbance within the burial area. If the known or suspected burials are thought to be Native American or of Native American ancestry, the landowner or developer must submit construction and development plans to the OSA and the Minnesota Indian Affairs Council (MIAC) for their review before the plans are finalized and prior to any disturbance within the burial area. The OSA and MIAC have 45 days to make recommendations for the preservation or removal of the human burials or remains that may be endangered by construction or development activities.

To determine potential cultural resource impacts, known archaeological and historic resources in or adjacent to the project were identified through a review of the OSA online portal and Minnesota's Statewide Historic Inventory Portal (MnSHIP), the Minnesota SHPO online portal in March 2025. MnSHIP is a comprehensive database of all documented historic architectural resources for the entire state, while the OSA portal is a database of all previously recorded archaeological sites in the state.

4.9.1 Archaeological Resources and Historic Cemeteries

The OSA online portal indicates that there are no previously recorded archaeological resources located within 1 mile of the project. The applicant, in consultation with the Commission, OSA and SHPO, may plan to conduct an archaeological survey for the project as needed ahead of construction.

The OSA Portal was also reviewed for historic cemetery locations, as documented in Vermeer and Terrell (reference (54)). Two historic cemeteries were identified within 1 mile of the project, none of which are within the route width (Map 4-10). St Paul's Cemetery (MNCEMID 21293), also known as the Old

Lutheran Cemetery and the Old Rost Cemetery, is mapped at the PLS Forty level in the OSA portal. However, modern aerial imagery shows that the cemetery is platted and confined to approximately 1.4 acres in the northeast corner of Section 28 of Township 102N, Range 37W, approximately 0.9 miles north of the project centerline.

Grace Church Cemetery (MNCEMID 21280), also mapped at the PLS Forty level in the OSA portal, is a church cemetery associated with historic architectural resource JK-EWT-00002/Grace Lutheran Church. The cemetery is shown on modern aerials within the property of Grace Lutheran Church with a footprint of less than one acre, approximately 1 mile west of the project centerline in the southwest quadrant of Section 22 of Township102N, Range 38W.

4.9.1.1 Impacts

Archaeological resource impacts could result from construction activities such as ROW clearing, placement of structures, construction of access roads, temporary construction areas, and vehicle and equipment operation.

No known archaeological resources have been documented within 1 mile of the project; therefore, no impacts to previously recorded archaeological resources are anticipated as a result of the project. While two historic cemeteries have been recorded within the 1-mile study area, all of these are clearly delineated, and are not within or adjacent to the route width. Therefore, these cemeteries will not be impacted by the project.

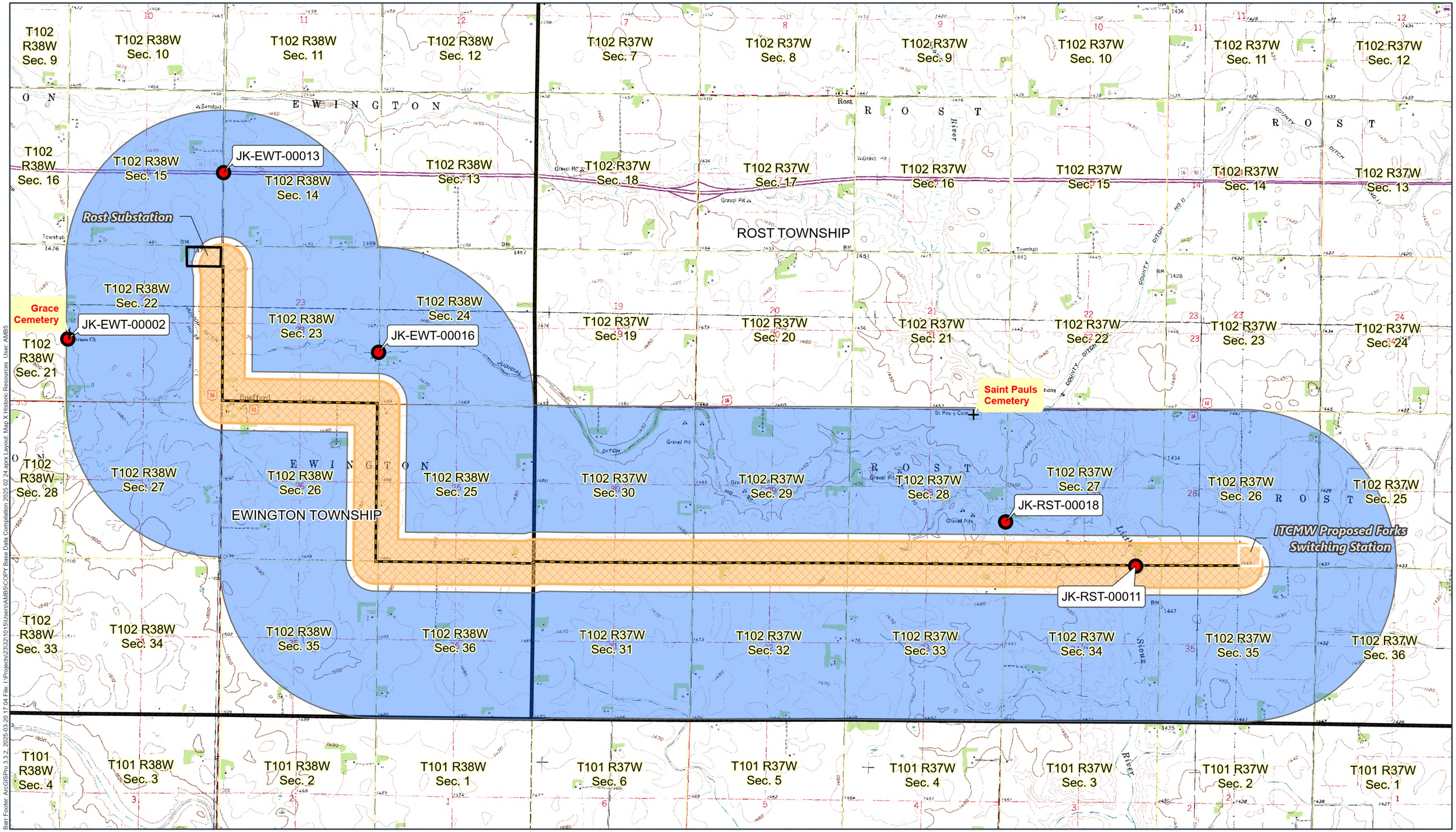
4.9.2 Historic Architectural Resources

A review of the MnSHIP portal indicates that there are five previously inventoried historic resources located within 1 mile of the project, one of which is within the Project route width (Table 4-17; Map 4-10). The resource within the route width consists of Bridge L9312/JK-RST-00011. This timber slab bridge, constructed in 1970, crosses the Little Sioux River along 770th street. This resource is not eligible for the NRHP (reference (55)).

Of the four documented resources that are within the 1-mile study area, but outside the route width, three are bridges, all of which were determined not eligible for the NRHP, and Grace Lutheran Church, which is unevaluated for the NRHP. Grace Lutheran Church is approximately one mile west of the westernmost extent of the project route width. Due to the distance from the project, and vegetative screening along the western side of the church, the project would not be within the viewshed of this resource.

Table 4-17 Historic Architectural Resources within the 1 Mile Study Area

Resource Number	Resource Type	NRHP Eligibility	Location
JK-RST-00011	Bridge L9312, ca. 1970	Not Eligible	Route Width
JK-EWT-00002	Grace Lutheran Church, ca. 1932	Unevaluated	1 Mile
JK-EWT-00013	Bridge 32801	Not Eligible	1 Mile
JK-EWT-00016	Bridge L5233	Not Eligible	1 Mile
JK-RST-00018	Bridge 88992	Not Eligible	1 Mile



Historic Architectural Resources
Cemetery
Applicant's Proposed Alignment
Route Width (Proposed Route)
1 Mile Buffer

0 3,000 6,000
Feet

Map 4-10

HISTORIC RESOURCES
Forks-Rost 161 kV Project

4.9.2.1 Impacts

Historic resource impacts could result from construction activities such as ROW clearing, placement of structures, construction of access roads, temporary construction areas, and vehicle and equipment operation. Impacts could also result from the removal of historic resources.

Additional impacts can result from transmission line location and operation. Impacts can occur if the project is located near or within view of a historic resource and the resulting change in viewshed negatively affects the setting, feeling, and/or association of the resource. This issue is especially pertinent for cultural resources where the surrounding environment plays a crucial role in defining their character and significance.

However, the project will not have the potential to impact documented NRHP-listed or eligible properties. Bridge L9312/JK-RST-00011 is within the Project area, but this resource is not eligible for listing on the NRHP (Map 4-10). Further, this bridge crosses 770th Street over the Little Sioux River, and the project will parallel this existing transportation infrastructure. The bridge represents infrastructure critical to the function of the rural, agricultural community in the same way that the project will provide critical infrastructure for the community, and thus, the project will not alter this resource's setting, feeling, appearance, and/or association.

4.9.2.2 Mitigation Measures

The preferred impact mitigation for archaeological or historic resources is prudent structure placement to avoid known archaeological resources. However, no previously recorded archaeological or historic resources will be impacted by this project. An archaeological survey may be conducted prior to project construction to determine whether unidentified archaeological resources are present within the project area.

If unanticipated archaeological or historic resources are discovered during construction, as noted in Section 6.4.3 of the Route Permit Application, project construction activities will cease at that location and the SHPO and OSA will be contacted to assist in the development of appropriate resource protection measures.

In addition, if human remains or suspected burial sites are discovered during construction, the state archaeologist will be contacted, and construction will cease at the location until the applicants and the state archaeologist have developed adequate mitigation measures as per Minn. Statute 307.08.

4.10 Natural Environment

Transmission lines have the potential to impact the natural environment through temporary, construction-related impacts and long-term impacts on water resources, vegetation, and wildlife as discussed in the following sections.

4.10.1 Water Resources

Hydrologic features located within the project include streams, wetlands, and groundwater resources. Bothe surface and groundwater resources are addressed in this section.

4.10.1.1 Surface Waters

The project is located in the Little Sioux watershed in south central Minnesota. The Little Sioux River drains south to the Missouri River. The project will cross two named streams – Judicial Ditch 28 and Little Sioux River. Map 4-11 shows the watershed, surface water resources, and water quality impairments in the project.

Surface waters in Minnesota are regulated by different entities at the federal and state levels. The USACE regulates the placement of dredged or fill materials in wetlands and other waters under its jurisdiction. The DNR regulates watercourses, water basins, and wetlands that are designated as significant recreational or natural resources in Minnesota and are referred to as public waters. These waters are delineated in the state's public waters inventory (PWI). The DNR requires a permit for crossing or working within the boundaries of designated public waters. Both Judicial Ditch 28 and the Little Sioux River are identified as public waters Table 4-18.

Section 303(d) of the CWA requires that states publish a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters) every two years. The Little Sioux River (AUID: 1020003-554) is impaired for Escherichia coli (E. coli) (reference (56)). The MPCA has delegated authority to set water quality standards and list waters as impaired that exceed the standard. Water quality standards are set by a waterbody's beneficial uses into seven classifications:

- Class 1 waters, domestic consumption
- Class 2 waters, aquatic life and recreation
- Class 3 waters, industrial consumption
- Class 4 waters, agriculture and wildlife
- Class 5 waters, aesthetic enjoyment and navigation
- Class 6 waters, other uses and protection of border waters
- Class 7 waters, limited resource value waters

The Little Sioux River is designated as Class 2Bg which means it is intended to support aquatic life and recreation for cool and warm water aquatic life and habitat. Judicial Ditch 28 is designed as Class 2Bg and 3C. The 3C classification refers to waters that have limited resource value.

Table 4-18 Water Courses within the Right-of-Way

Dataset	Crossing Count	Length within the ROW (feet)	Public Water Inventory	Impairment
Judicial Ditch 28	1	107	PWI-039-012	N/A
Little Sioux River	1	108	PWI-039	E. coli
Other Stream Crossings	1	105	N/A	N/A

Wetlands are defined as those areas that are inundated by surface or groundwater with a frequency to support, and under normal circumstances does or would support, a prevalence of vegetation or aquatic

life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Wetlands are protected at the federal level under Section 404 of the CWA and at the state level under the Minnesota WCA and the DNR PWI program. According to the USFWS National Wetland Inventory (NWI), four wetlands totaling approximately 3.58 acres are located in the project ROW (Table 4-18).

The applicant's consultant, Merjent, Inc. (Merjent), conducted a desktop wetland determination. The result of the Level 1 wetland determination identified 50 potential palustrine emergent (PEM) wetlands. All were farmed wetlands or wet roadside ditches adjacent to farmed wetlands. Table 4-19 summarizes the results of the desktop delineation. In April 2024, Merjent conducted a field-based wetland delineation within the proposed Forks Switching Station, no wetlands were identified.

Table 4-19 Desktop Delineated Water Features

Dataset	Area within the ROW (acres)	Length within the ROW (feet)
Streams	N/A	289.3
Waterways	N/A	59.8
Wetlands	11.05	N/A

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Desktop Delineated Stream
Public Waters Inventory (PWI) Watercourse
National Hydrography Dataset (NHD) Flowline
Desktop Delineated Wetland
National Wetlands Inventory (NWI) Non-Forested Wetland

0 650 1,300
Feet

Map 4-11
Page 1 of 5
WATER RESOURCES
Forks-Rost 161 kV Project

T102 R38W
Sec. 27

T102 R38W
Sec. 26

EWINGTON
TOWNSHIP

T102 R38W
Sec. 25

T102 R38W
Sec. 34

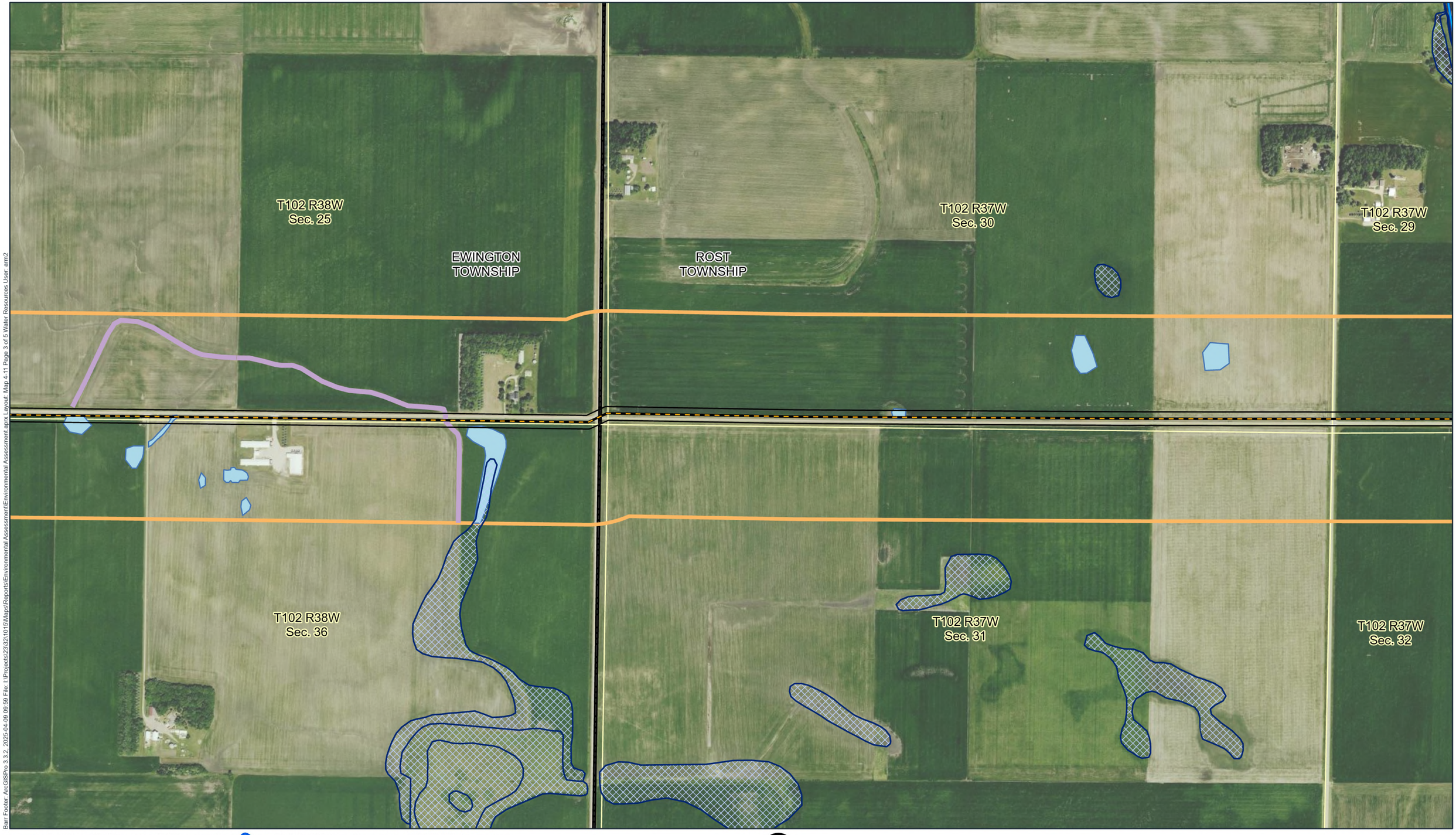
T102 R38W
Sec. 35

T102 R38W
Sec. 36

Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Desktop Delineated Stream
Public Waters Inventory (PWI) Watercourse
National Hydrography Dataset (NHD) Flowline
Desktop Delineated Wetland
National Wetlands Inventory (NWI)
Non-Forested Wetland

0 650 1,300
Feet

Map 4-11
Page 2 of 5
WATER RESOURCES
Forks-Rost 161 kV Project

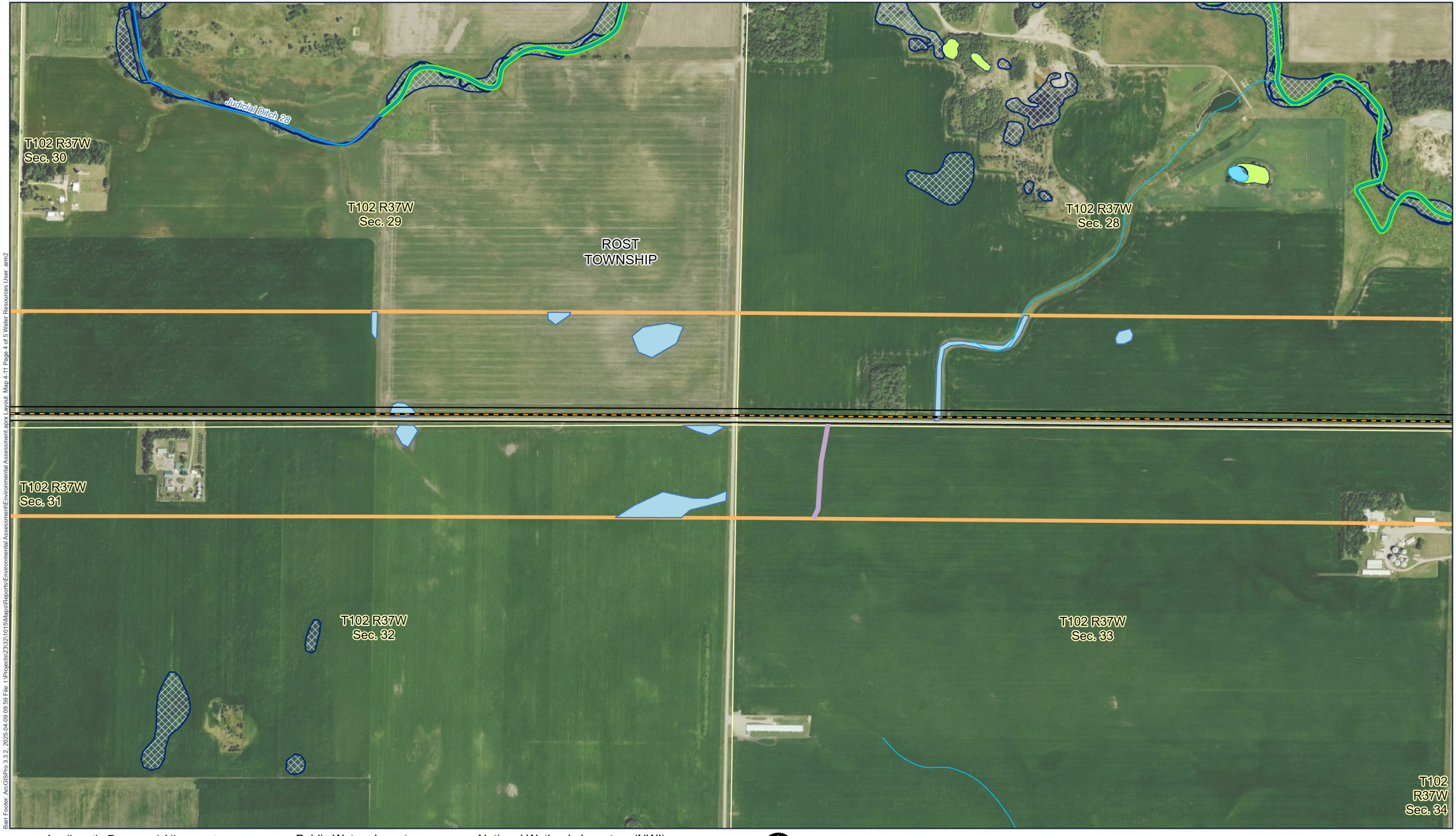


Applicant's Proposed Alignment
Right of Way
Route Width (Proposed Route)
Desktop Delineated Stream
Public Waters Inventory (PWI) Watercourse
National Hydrography Dataset (NHD) Flowline
Desktop Delineated Wetland
National Wetlands Inventory (NWI) Non-Forested Wetland

N

0 650 1,300
Feet

Map 4-11
Page 3 of 5
WATER RESOURCES
Forks-Rost 161 kV Project



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- Applicant's Proposed Alignment
- Route Width (Proposed Route)
- Right of Way
- Desktop Delineated Stream
- MPCA Impaired Waters (2024 Draft) Impaired Stream
- Public Waters Inventory (PWI) Watercourse
- National Hydrography Dataset (NHD) Flowline
- Desktop Delineated Wetland

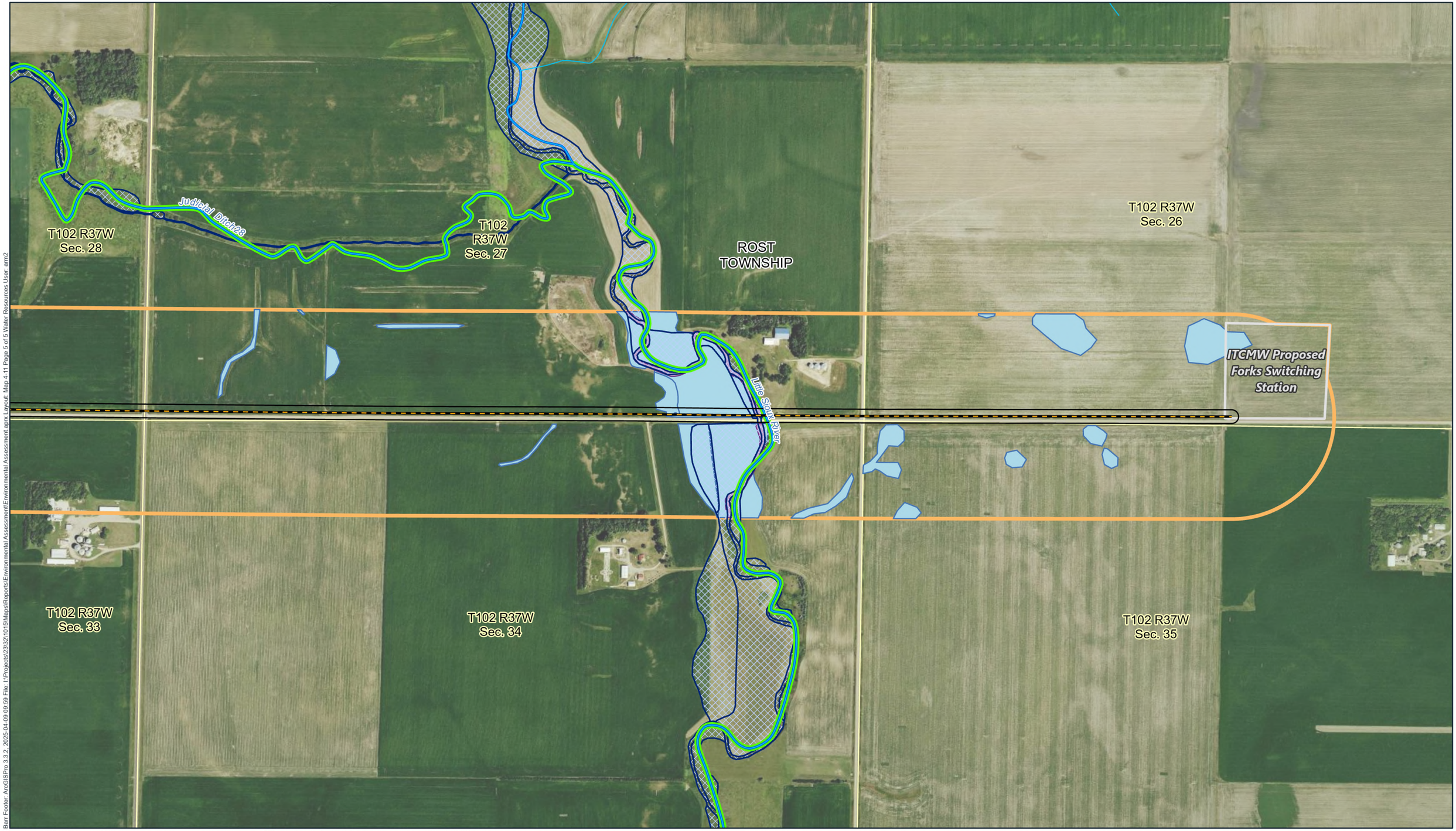
National Wetlands Inventory (NWI)

- Forested Wetland
- Non Forested Wetland

N

0 650 1,300
Feet

Map 4-11
Page 4 of 5
WATER RESOURCES
Forks-Rost 161 kV Project



Barr Footer: ArcGISPro 3.3.2, 2025-04-09 09:59 File: I:\Projects\23\32\1015\Maps\Reports\Environmental Assessment\Environmental Assessment.aprx Layout: Map 4-11 Page 5 of 5 Water Resources User: arm2

- Applicant's Proposed Alignment
- Right of Way
- Route Width (Proposed Route)
- MPCA Impaired Waters (2024 Draft) Impaired Stream
- Public Waters Inventory (PWI) Watercourse
- National Hydrography Dataset (NHD) Flowline
- Desktop Delineated Waterway
- Desktop Delineated Wetland
- National Wetlands Inventory (NWI) Non-Forested Wetland

0 650 1,300
Feet

Map 4-11
Page 5 of 5
WATER RESOURCES
Forks-Rost 161 kV Project

4.10.1.2 Impacts

It is anticipated that impacts to water courses and wetlands will be avoided during construction of the project. Structure locations will be adjusted to avoid disturbing the streams and wetlands. No surface water crossing will be greater than 1,000 feet, meaning all surface waters can be spanned to avoid placing a structure within these resources. Removal of vegetation and soil cover may result in short-term water quality impacts due to increased turbidity.

Wetlands can be impacted by soil erosion and sediment deposition during construction. Sedimentation and ground disturbance in wetlands can make them more susceptible to the establishment of invasive plant species, such as reed canary grass, which will adversely impact wetland function by reducing vegetative biodiversity and altering wildlife habitat.

The project is not expected to contribute to or exacerbate the E. coli impairment on the Little Sioux River.

4.10.1.3 Mitigation Measures

It is anticipated that impacts on water courses and wetlands will be avoided with the construction of this project. No permanent impacts to surface waters or wetlands are anticipated, and mitigation for such impacts is not proposed.

The project will be required to obtain a NPDES/SDS permit for construction stormwater runoff. The applicants will apply for authorization to discharge stormwater associated with construction activity under the MPCA NPDES/SDS Construction Stormwater General permit (MNR100001). The project will develop a SWPPP that will identify BMPs that will be implemented during construction to minimize erosion, and sedimentation impacts to surface waters. Erosion and sedimentation abatement measures, for example, will be employed to mitigate impacts to impaired waters.

4.10.1.4 Groundwater

The DNR divides Minnesota into six groundwater provinces. The project is located within Minnesota's South-Central province (Province 2). This province is characterized as fine-grain surficial aquifers underlain with sedimentary bedrock aquifers (reference (57)). There are no springs located within the ROW. The approximate depth to shallow groundwater is 0-10 feet within the project (reference (58)).

The Minnesota Department of Health maintains the Minnesota Well Index (MWI) which provides information about wells and borings such as location, depth, geology, construction, and static water level. According to the MWI, there are no wells within the ROW.

4.10.1.5 Impacts

Project groundwater impacts are anticipated to be minimal. Potential impacts to groundwater could occur through: (1) surface water impacts infiltrating to groundwater; and/or (2) impacts directly related to constructing structure foundations. Groundwater in the area may be encountered in the shallow quaternary aquifer and sandstone aquifer. Surface water impacts can lead to groundwater impacts; thus, concerns are similar (i.e., construction activities which lead directly to sedimentation or through disturbed soils and vegetation). Mitigation of these impacts can be affected by measures to control soil erosion and sedimentation.

Direct groundwater impacts may occur as a result of the construction and placement of transmission line structures. Structure foundations will generally range from 25 to 40 feet in depth. Since there are no wells

within the ROW, other wells in the vicinity generally are installed to depths deeper than the foundation depths, and since concrete components of the foundations have relatively low solubility, no direct impacts to groundwater are anticipated.

4.10.1.6 Mitigation

Mitigation measures proposed for surface water impacts are also anticipated to provide mitigation for groundwater impacts during construction. The applicant notes that if shallow depths to groundwater resources are identified during geotechnical design of the project, specialty structures with wider, shallower foundations may be used.

4.10.2 Geology

The surface geology within the project area is dominated by quaternary-aged glacial deposits from the most recent Wisconsinan glaciation. Loamy, unmixed sands, silts, and gravels originating from moraine sediments deposited by the Des Moines glacial lobe are most prevalent within the project and are part of the New Ulm Formation. Holocene-aged, post-glacial floodplain alluvium consisting of gravelly sand to sandy silts is present near stream channels (reference (59)). The thickness of the glacial deposits vary depending on the location and type of deposit; thicknesses beneath the project are anticipated to be approximately 300 feet thick or greater (reference (60)). The bedrock underlying the project consists of Cretaceous-aged, undifferentiated materials deposited in marine and non-marine settings. This material consists of conglomerates, sandstones, mudstones, shales, marlstones, siltstones, and minor amounts of lignite intermixed (reference (61)).

Karst topography is formed from the dissolution of carbonate minerals, found in limestone and dolostone, over time from rain and groundwater. Where karst topography is present, there is the potential for encountering common karst features, including sinkholes, caves, and springs. The bedrock that underlies the project does not consist of limestone or dolostone, and the nearest mapped karst feature is a sinking stream located over 60 miles north of the project (reference (62)).

The project's seismic risk is very low, as it is located within an area rated as having less than a 2% chance of damage from natural or human-induced earthquakes in 10,000 years (reference (63)). The most intense earthquake recorded in the area occurred in 1860 and was documented as a seven on the Modified Mercalli Intensity Scale. The majority of the remaining recorded earthquakes were documented as having a magnitude of less than five on the Modified Mercalli Intensity Scale (reference (64)).

Landslides are common throughout Minnesota due to the presence of unconsolidated glacial till deposits at the surface. Landslide susceptibility can vary based on several factors, including the slope angle, water content, and sediment properties. Landslides most commonly occur in Minnesota due to slope failure during heavy rain events (reference (65)).

4.10.2.1 Impacts

The construction methods used for the project will not alter the geology of the region; therefore, no impacts to geologic resources are anticipated as a result of the project. The nearest mapped karst feature is over 60 miles away from the project, and the bedrock is not conducive to forming karst features, so encountering any unmapped features is unlikely. Changes in slope are not anticipated during the project, and as a result, there would be limited risk of landslides.

4.10.2.2 Mitigation Measures

No impacts to geologic resources are anticipated; therefore, no mitigation measures are proposed.

4.10.3 Soils

Soil information for the project was obtained from the USDA NRCS SSURGO database (reference (66)). The dominant soils within the project are loam (38%) and silty clay loam (45%).

According to the SSURGO database, exposed soils in the area have a slight to moderate erosion hazard. The ratings in this interpretation indicate the hazard of soil loss from off-road and off-trail areas after disturbance activities that expose the soil surface.

Soil compaction susceptibility within the area ranges from low to medium. Soil compaction is primarily caused by wheel traffic and occurs when moist or wet soil particles are pressed together, reducing pore space between them.

Hydric soils are present throughout the area. A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. Hydric soils are typically associated with lowlands and wetlands and are rated by their proportion of hydric soil in the map unit. Approximately 44 acres were classified as hydric, predominantly hydric, or partially hydric. The remaining 57 acres are classified as predominantly non-hydric or not hydric.

4.10.3.1 Impacts

Project soil impacts are anticipated to be minimal and temporary. Soil impacts are dependent, to some extent, on the soil surface conditions at the time of construction. Construction activities that occur on wet soils tend to have longer lasting impacts regardless of the soil type. During dry conditions, soil disturbances will be temporary, minimal, and generally less invasive than typical agricultural practices such as plowing and tilling.

Surface soils would be disturbed by site clearing, grading, and excavation activities at structure locations, pulling and tensioning sites, and setup areas. Soil disturbance will occur during the transport of crews, machinery, materials, and equipment over access routes (primarily along rights-of-way). Soil erosion may occur if surface vegetation is removed, especially on fine textured soils that occur on sloping topography, exposing soils to wind and water erosion. Topsoil could be lost to improper handling or erosion, and loss of soils could adversely impact water resources in the area. Soil compaction and rutting could occur from movement of construction vehicles on access paths and at other locations because of heavy equipment activity.

4.10.3.2 Mitigation Measures

Identifying specific staging areas and associated impacts will be completed during final design. Potential impacts to soils would be minimized by using BMPs for construction of the project as required by the route permit and other state and federal permits. The applicant developed an Agricultural Impact Mitigation Plan for the project; the plan is located in Appendix H. Common measures employed to minimize soil erosion include:

- Using low ground pressure construction equipment, which are designed to minimize impacts to soils in damp areas.
- Implementing measures to minimize erosion and sedimentation during construction and employing perimeter sediment controls, protecting exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking.
- Grading contours so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. Returning all areas disturbed during construction to pre-construction conditions.
- Obtaining a NPDES construction stormwater permit from the MPCA and preparing a SWPPP.
- Erecting or using sediment control fences that are intended to retard flow, filter runoff, and promote the settling of sediment out of runoff via ponding behind the sediment fence.
- Using erosion control blankets and turf reinforcement mats that are typically single or multiple layer sheets made of natural and/or synthetic materials that provide structural stability to bare surface and slopes.
- Separating topsoil and subsoil and covering stockpiled soils.
- Returning locations, where grading or temporary access is required, to their original land contour and elevation to the greatest extent possible.
- Seeding to establish temporary and permanent vegetative cover on exposed soil. Soils will be revegetated as soon as practicable to minimize erosion.
- Revegetating disturbed areas using weed-free seed mixes and using weed-free straw and hay for erosion control.
- Using mulch to form a temporary and protective cover on exposed soils. Mulch can help retain moisture in the soil to promote vegetative growth, reduce evaporation, insulate the soil, and reduce erosion. A common mulch material used is hay or straw.

4.10.4 Vegetation

The project is within the Coteau Moraines ecological subsection as mentioned in Chapter 4.2. This subsection is a transitory zone of loess, windblown silt, from shallow to deep. Pre-European settlement vegetation consisted of tallgrass prairie dissected by narrow stream margins (reference (4)). Forests were limited to ravines and along river corridors. Wildfire played an important role in maintaining the prairie plant community before settlement.

Present-day vegetation consists of herbaceous agricultural vegetation, cultivated crops, and developed lands. Sensitive vegetation resources, such as native plant communities, and Scientific and Natural Areas are discussed in Chapter 4.11. Table 4-20 provides the area of various landcovers observed within the ROW. According to the NLCD, the majority of the ROW vegetation consists of cultivated cropland and developed open spaces, which consist of roadside ditches.

Table 4-20 NLCD Landcover

Landcover Type	Area within ROW (acres)	Percentage of ROW
Developed, Open Space	39.1	38.3%
Developed, Low Intensity	2.5	2.4%
Developed, Medium Intensity	3.1	3.0%
Developed, High Intensity	0.4	0.4%
Herbaceous	0.4	0.3%
Cultivated Crop	55.5	54.4 %
Emergent Herbaceous Wetlands	1.2	1.2%

4.10.4.1 Impacts

Project construction will result in short-term impacts on existing vegetation, including localized physical disturbance and soil compaction. Construction activities involving the development and use of access roads, staging, and stringing areas will also have short-term impacts on vegetation by concentrating surface disturbance and equipment use. Permanent vegetation clearing will be required in the designated structure installation areas, resulting in an impact area measuring 8 feet in diameter for typical structures and 12 feet in diameter for dead-end and angle structures. Construction will also result in long-term impacts to vegetation by permanently removing taller-growing woody vegetation within the ROW.

Construction and maintenance activities have the potential to result in the introduction or spread of noxious weeds and other non-native species. Noxious weeds could be introduced to new areas through propagating material like roots or seeds transported by contaminated construction equipment. Activities that could potentially lead to the introduction of noxious weeds and other non-native species include ground disturbance that leaves soils exposed for extended periods, introduction of topsoil contaminated with weed seeds, vehicles importing weed seed, and conversion of landscape type.

4.10.4.2 Mitigation Measures

The primary means of mitigating vegetation impacts is to avoid particular vegetation, such as trees, through prudent routing. Mitigation can be achieved, in part, by using existing infrastructure rights-of way (e.g., roadway) such that tree removal is minimized. Mitigation can also be accomplished by spanning areas of sensitive vegetation, native plant communities, and other sensitive ecological resources.

Vegetation impacts can also be mitigated by a number of other strategies, including:

- Follow existing road ROW.
- Limiting new access roads for construction.
- Constructing during fall and winter months to limit plant damage.
- Leaving or replanting compatible plants at the edge of the transmission line ROW.
- Replanting the transmission line ROW with low-growing, native species.
- Limiting vehicle traffic to roads along the ROW and within previously disturbed areas.

Potential noxious weed impacts can be mitigated by:

- Revegetating disturbed areas using weed-free seed mixes and using weed-free straw and hay for erosion control.
- Removal of invasive species/noxious weeds via herbicide and manual means consistent with easement conditions and landowner restrictions.
- Cleaning and inspecting construction vehicles to remove dirt, mud, plant, and debris from vehicles prior to arriving at and leaving construction sites.

Vegetation impacts can also be mitigated by providing compensation to individual landowners through negotiated easement agreements.

4.10.5 Wildlife

The project provides limited habitat for wildlife species, as much of the landscape has been converted to cultivated crops. The project is in a former prairie-dominated landscape that boasts wildlife such as songbirds, white-tailed deer, small mammals, reptiles, and amphibians. The project does not offer areas of cover such as forests or prairies. Perennial vegetation coverage is sparse and limited to roadside ditch, stream corridors, and residential properties. Riparian corridors along major streams offer dense vegetation and some tree cover.

The state of Minnesota is in the Central Flyway of North America. The Central Flyway is a bird migration route that encompasses the Great Plains of the U.S. and Canada. Migratory birds use portions of the Central Flyway as resting grounds during spring and fall migration, as well as breeding and nesting grounds throughout the summer. Within and near the project, there is limited suitable habitat for migratory birds.

Migratory birds are protected under the MBTA of 1918 (16 USC 703-712), which prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Bald eagles (*Haliaeetus leucocephalaus*) and golden eagles (*Aquila chrysaetos*) are protected under the MBTA and the federal BGEPA; 16 USC 668-668d, which specifically prohibits the taking or possession of and commerce in, either alive or dead, of any part, nest, or egg of these eagles.

4.10.5.1 Impacts

For non-avian wildlife, construction activities that generate noise, dust, or disturbance may result in short-term, indirect impacts on wildlife. During project construction, wildlife will generally be displaced within the ROW. Clearing and grading activities could also affect small mammals that may be unable to avoid equipment. Many wildlife species will likely avoid the immediate area during construction; the distance that animals will be displaced depends on the species and the tolerance level of each animal. However, comparable habitat is available adjacent to the project.

Potential impacts to avian species (e.g., songbirds, raptors, and waterfowl) include those described above for non-avian species but also include impacts due to electrocution and collision with transmission line conductors. Electrocution occurs more frequently with larger bird species, such as hawks, because they have wider wingspans that are more likely to create contact with the conductors. To avoid and minimize the potential electrocution of avian species, the project will be constructed in accordance with the Avian Power Line Interaction Committee's (APLIC) safety recommendations (reference (67)). These

recommendations minimize electrocution risk by providing adequate clearance from energized conductors to grounded surfaces and to other conductors.

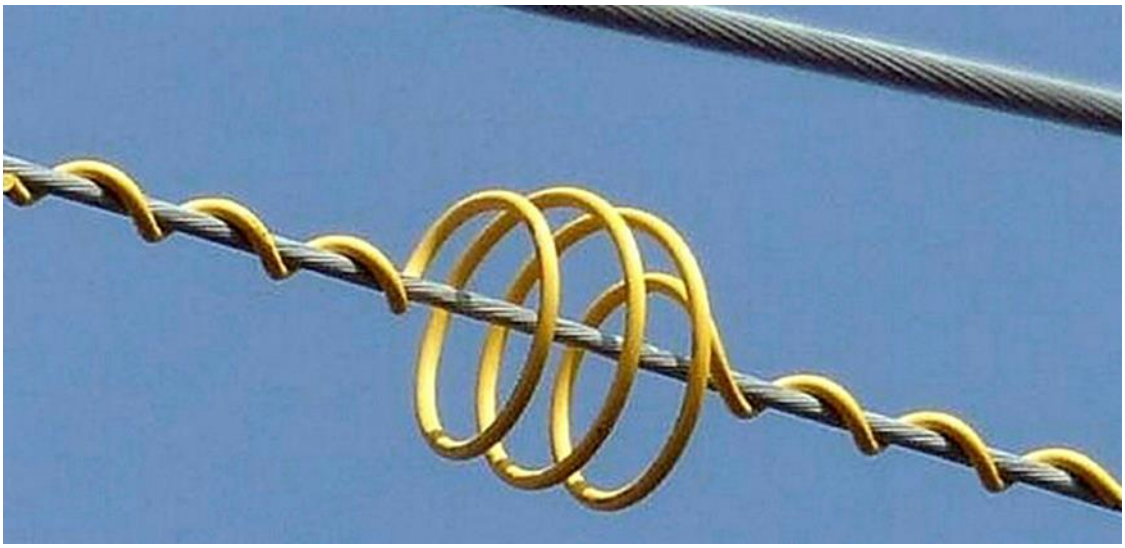
Independent of the electrocution risk, birds may be injured by colliding with transmission line structures and conductors. The collision risk is influenced by several factors including habitat, flyways, foraging areas, and bird size. Waterfowl, especially larger waterfowl such as swans and geese, are more likely to collide with transmission lines. The collision frequency increases when a transmission line is placed between agricultural fields that serve as feeding areas and wetlands or open water, which serve as resting areas. In these areas, it is likely that waterfowl and other birds would be traveling between different habitats, increasing the likelihood of a collision.

The potential long-term project impacts to wildlife are anticipated to be minimal. Potential wildlife impacts can be mitigated or minimized through a few strategies.

4.10.5.2 Mitigation Measures

Bird collisions with transmission lines can be mitigated by configuring the conductors in a single horizontal plane or through the use of bird flight diverters. Diverters enable birds to better see conductors during flight and avoid collisions with them. A typical diverter is shown Figure 4-7. Bird diverters will be installed across the PWI waterway crossings, in accordance with the DNR License to Cross Public Waters. The primary mitigation strategy is to avoid disturbing and placing structures within riparian areas.

Figure 4-7 Bird Flight Diverter



4.11 Rare and Unique Natural Resources

This chapter describes rare and unique natural resources, including federally and state protected species and sensitive ecological resources, which are present throughout the project's geographic area.

Federally endangered or threatened species are protected under Section 7 of the Endangered Species Act (ESA) of 1973. Data on federally protected species were reviewed using the USFWS Information for Planning and Consultation (IPaC) online tool.

State endangered or threatened species are protected under the Minnesota Endangered Species Statute (Minn. Statute 84.0895). The DNR Conservation Explorer online tool (License Agreement #2022-008) was used to assess the presence of sensitive ecological resources in the area. Sensitive ecological resources may provide habitat suitable for federal and/or state protected species.

4.11.1 Protected Species

4.11.1.1 Federally Protected Species

The USFWS IPaC online tool was queried on March 17, 2025, for a list of federally threatened and endangered species, proposed species, candidate species, and designated critical habitat that may be present within the vicinity of the project (Appendix I). The IPaC query identified six federal species that could potentially be in the vicinity of the project, including one endangered species, two threatened species, two proposed endangered species, and one proposed threatened species. These species and their typical habitats are summarized in Table 4-21.

The project does not traverse any federally designated critical habitat.

Table 4-21 Federal Species Potentially Present in the Vicinity of the Project

Scientific Name	Common Name	Federal Status	State Status	Habitat
Myotis septentrionalis	Northern Long-eared Bat	Endangered	Special concern	Forested habitat in active season; caves and mines during inactive season [1]
Perimyotis subflavus	Tricolored Bat	Proposed Endangered	Special concern	Forested habitat in active season; caves and mines during inactive season [2]
Danaus plexippus	Monarch Butterfly	Proposed Threatened	Not listed	Areas with a high number of flowering plants. Presence of milkweed (Asclepias spp.) to complete the caterpillar life stage [3]
Bombus suckleyi	Suckley's Cuckoo Bumble Bee	Proposed Endangered	Not listed	Areas with a high number of flowering plants during active season; overwinter a few inches below the soil surface in mesic hardwoods [4]
Lespedeza leptostachya	Prairie Bush-clover	Threatened	Threatened	Disturbed tallgrass prairie habitats and undisturbed remnant prairies [5]
Platanthera praeclara	Western Prairie Fringed Orchid	Threatened	Endangered	Moist tallgrass prairies and sedge meadows [6]

[1] Source: reference (68)
[2] Source: reference (69)
[3] Source: reference (70)
[4] Source: reference (71)
[5] Source: reference (72)
[6] Source: reference (73)

4.11.1.2 Impacts

Potential short-term impacts on federally protected wildlife species could occur during project construction, will be similar to those described for non-listed species in Chapter 4.10.5, and may include displacement of protected species during construction activities that generate noise, dust, or disturbance of habitat.

Impacts on northern long-eared bats could occur if clearing or construction takes place during the bat's active season when the species are breeding, foraging, or raising pups in forested habitat. Bats may be injured or killed if occupied trees are cleared during the active season, and the species may be disturbed during clearing or construction activities due to noise or human presence.

The tricolored bat is a federal proposed endangered species, which means that the USFWS has determined it is in danger of extinction throughout all or a significant portion of its range and has proposed a draft rule to list it as endangered. Until the rule to list this species is finalized, it is not protected by the take prohibitions of the federal ESA. Potential impacts to tricolored bats are similar to those described for northern long-eared bats.

The monarch butterfly is a federal candidate species, which means that it is a species for which the USFWS has sufficient information to propose listing them as endangered or threatened under the ESA, but their listing has not been finalized yet. Candidate species have no federal protection under the ESA.

The Suckley's cuckoo bumble bee is a federal proposed endangered species, which means that the USFWS has determined it is in danger of extinction throughout all or a significant portion of its range and has proposed a draft rule to list it as endangered. Until the rule to list this species is finalized, it is not protected by the take prohibitions of the federal ESA. Potential impacts to Suckley's cuckoo bumble bee could occur due to suitable habitat removal; however, impacts are anticipated to be minimal given the abundance of comparable habitat in the area.

The prairie bush-clover is a federally and state threatened species that inhabits isolated prairie habitats and remnant prairies on steep slopes. Potential impacts to the prairie bush-clover could occur due to disturbance of habitat during and after construction through physical clearing and herbicide application. However, since the project contains primarily agricultural land and regularly maintained ROW, the project is expected to have no effect on the prairie bush-clover due to the lack of suitable habitat.

The western prairie fringed orchid is a federally threatened species and state endangered species that inhabits remnant native plant communities. Potential impacts to the western prairie fringed orchid could occur due to disturbance of habitat during and after construction through physical clearing and herbicide application. However, since the project contains primarily agricultural land and regularly maintained ROW, the project is expected to have no effect on the western prairie fringed orchid due to the lack of suitable habitat.

4.11.1.3 Mitigation Measures

The primary means to mitigate potential impacts to federally protected species is to avoid routing through habitat utilized by these species. Additionally, impacts can be mitigated by incorporating species (or species type) specific BMPs in coordination with the USFWS. The applicant may be required to conduct field surveys for protected species in coordination with USFWS to determine the presence of particular species along the permitted route. If a protected species is unavoidable, a takings permit may be required, and other permit conditions may be set.

Impacts to northern long-eared bats could be minimized by consulting with USFWS on any necessary northern long-eared bat avoidance or mitigation measures.

4.11.2 State Protected Species

The applicant requested a DNR Natural Heritage Review in July 2023, to determine if any state endangered, threatened, or special concern species have been documented within 1 mile of the project. The NHIS database did not identify any state endangered, threatened, or special concern species within 1 mile of the project.

4.11.2.1 Impacts

No known state protected species have been documented within 1 mile of the project; therefore, no impacts to state protected species are anticipated as a result of the project.

4.11.2.2 Mitigation

Since there are no state protected species documented within 1 mile of the project, mitigation measures for state protected species are not proposed.

4.11.3 Sensitive Ecological Resources

The DNR has established several classifications for sensitive ecological resources across the state, with two being present within the project area (Map 4-9). Both the sensitive ecological resources, the Rost WPA and the Ulbricht WPA are located over one mile from the project. This area is shown in Map 4-9 but is not discussed further in this EA due to distance mitigating any potential for project-related impacts.

There are no state-mapped native plant communities, high conservation value forests, or Lakes of Biological Significance within 1 mile of the project.

4.11.3.1 Impacts

No known sensitive ecological resources have been documented within 1 mile of the project; therefore, no impacts to sensitive ecological resources are anticipated as a result of the project.

4.11.3.2 Mitigation Measures

Since there are no sensitive ecological resources documented within 1 mile of the project, mitigation measures for sensitive ecological resources are not proposed.

4.12 Use or Paralleling of Existing Right-of-Way

Sharing ROW with existing infrastructure minimizes fragmentation of the landscape and can minimize human and environmental impacts (e.g., aesthetic and agricultural impacts). The use and paralleling of existing transportation, pipeline, and electrical transmission systems or rights-of-way is one of the factors that the Commission considers when making a route permit decision (Minn. Rule 7850.4100). As discussed at the beginning of Chapter 3, ROW sharing is defined as co-locating the transmission line with other existing infrastructure ROW to partially share that existing ROW and lessen the overall easement width required for the project.

ROW-sharing opportunities exist for the entire length of the project in Minnesota, where the ROW for the route would be shared with 350th Ave, 780th St., 360th Ave, and 770th St., as depicted in Map 1-1.

4.13 Electric System Reliability

NERC has established mandatory reliability standards for American utilities. For new transmission lines, these standards require the utility to evaluate whether the grid would continue to operate adequately under various contingencies. The effects of these transmission contingencies on the system, and the transmission system's ability to serve load, must be monitored and managed by utilities. Route permits issued by the Commission require permittees to comply with NERC standards (Appendix E).

In developing possible project routes, the applicant analyzed whether these routes created reliability concerns. The applicant indicated that there are no reliability concerns with its proposed route and that this route supports and enhances the reliability of the regional electrical system. Thus, no adverse impacts to electric system reliability are anticipated.

4.14 Cost

As outlined in the RPA, the estimated project construction cost is between $13.5 and $18.8 million. Construction cost estimates rely on the best available information at the filing time of the RPA and include permitting, land acquisition and ROW, design/engineering, materials (e.g., steel, conductor, insulators, etc.), construction costs, and contingency. The cost estimate assumes the applicant will pay prevailing wages for applicable positions during project construction.

Once constructed, operation and maintenance costs associated with the new transmission line would be initially driven by controlling regrowth vegetation within the ROW. The estimated annual cost of ROW maintenance and operation is estimated to cost approximately $2,000 per mile. Storm restoration, annual inspections, and ordinary replacement costs are included in these annual operating and maintenance costs.

4.15 Cumulative Potential Effects

In Minnesota, cumulative potential effects are impacts on the environment that result from:

> *The incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects (Minn. Rule 4410.0200).*

Considering cumulative potential effects serves to assist decision-makers in avoiding decisions about a specific project in isolation. Effects that might seem minimal when viewed in the context of a single project can accumulate and become significant when the broader landscape of all projects is taken into account.

Cumulative effects are discussed for projects that have been planned or are otherwise foreseeable in the project area. The websites of several agencies/local governments were reviewed; these agencies included: the Minnesota Environmental Quality Board, the Commission, the Minnesota Department of Commerce, MnDOT, BWSR, MPCA, and DNR. In addition, the websites for Jackson County were reviewed.

Two projects considered for cumulative potential effects were identified in the project area – the Rost Substation and the Three Waters Wind project. As discussed in Chapter 1.2, Great River Energy has constructed the Rost substation. This project will connect to the Rost Substation at the western terminus of the proposed transmission line.

The Three Waters Wind Project is a potential wind farm in Jackson County, Minnesota (reference (74)). Map 4-12 provides the location of the Rost Substation and the Three Waters Wind project in relation to the project.

4.15.1 Human Settlements

Cumulative potential effects on human settlements are anticipated to be minimal. Future projects will result in aesthetic impacts. The Three Waters Wind project will result in large structures being visible in agricultural lands and along Interstate 90. At night, indicator lights would blink intermittently to notify low flying aircraft; however, the lights are not bright enough to cause noticeable light pollution.

The wind, transmission line, and substation projects are anticipated to minimally impact local zoning and land use, property values, noise, or cultural values.

4.15.2 Transportation and Public Services

Cumulative potential effects on transportation and public services are anticipated to have minimal to no impact. Transportation on local and township roads may have localized congestion as construction occurs if construction of the project overlaps with construction of the Three Waters Wind project.

4.15.3 Public Health and Safety

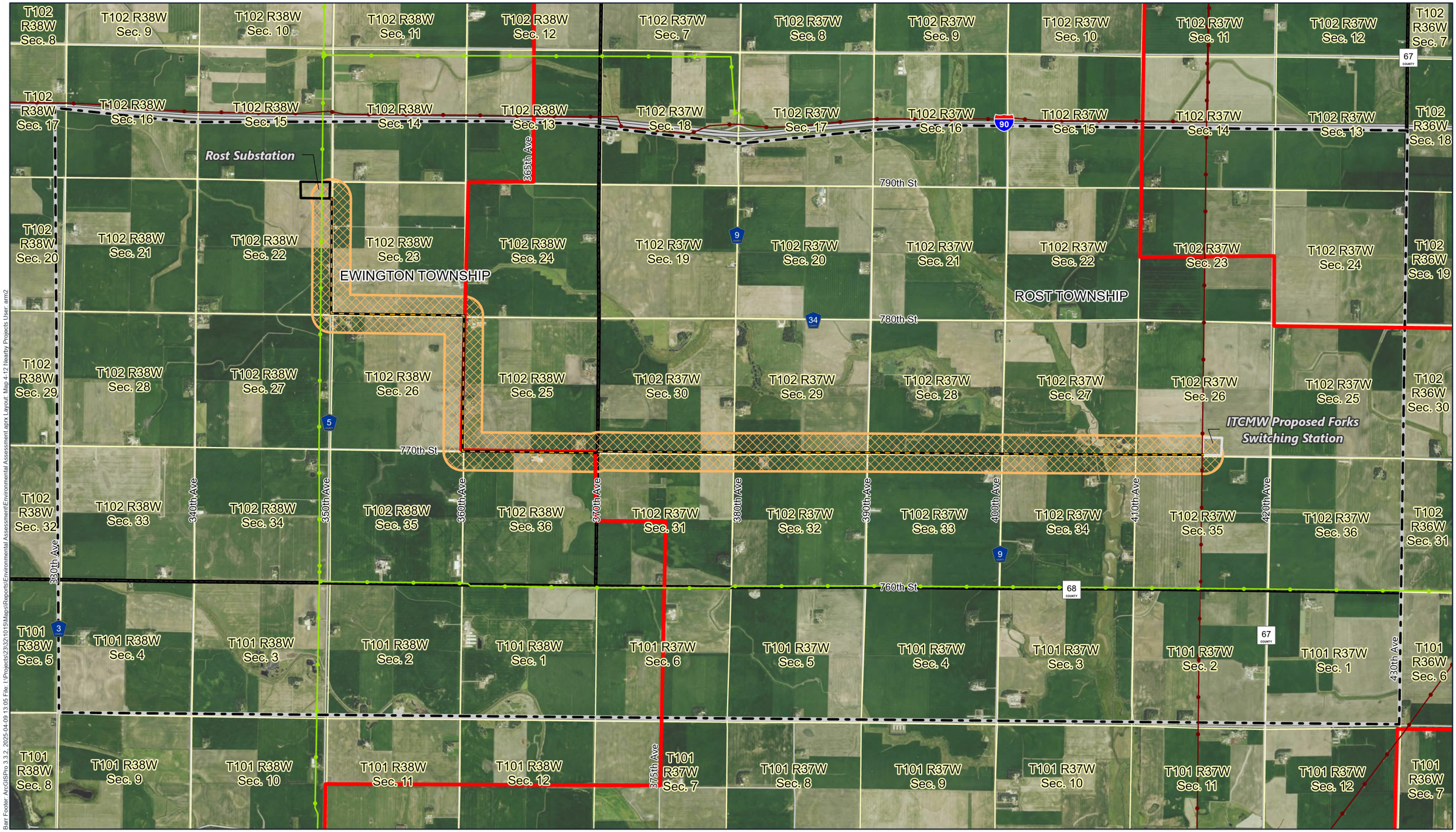
This project, in combination with the wind, transmission line, and substation projects, are not expected to create impacts to public health and safety. Because the Commission imposes a maximum electric field limit of 8 kV/m for new transmission projects, this project as well as the Rost Substation project will have to meet this permit condition. Accordingly, public health impacts related to induced voltages are anticipated to be minimal.

4.15.4 Climate and Air Quality

The project, in combination with the wind, transmission line, and substation projects will minimally impact the climate and air quality. When considered singularly, small amounts of emissions will be associated with each project due to the intermittent operation and maintenance activities of the project via mobile combustion and particulate roadway dust generation.

4.15.5 Land-Based Economies

Cumulative potential effects on land-based economies may occur but are anticipated to be minimal. The construction of wind turbines will necessitate taking small amounts of agricultural land out of production, which include the foundation and access road to the turbine; this is similar to construction of transmission structures.



Applicant's Proposed Alignment
Route Width (Proposed Route)
Forks-Rost Project Area
Three Rivers Project Area

Exsisting Transmission Lines
34kV - 115kV
116kV - 500kV

0 3,500 7,000
Feet

Map 4-12

NEARBY PROJECTS
Forks-Rost 161 kV Project

4.15.6 Archaeological and Historic Resources

The project does not contain known archaeological or historical properties within the ROW or the route width. Other historical features identified within one mile of the project are not considered eligible for preservation or have not been evaluated. The Three Waters Wind project, in its 2019 Site Permit Application, identified a number of potential historical structures and potential cultural resource sites. Most of the locations were not evaluated, some of the sites were listed as not eligible under NRHP, and numerous sites have not been evaluated (reference (75)). Therefore, the project in combination with the wind, and substation projects will minimally impact historical and cultural resources in the project area.

4.15.7 Natural Environment

The cumulative potential effects on the natural environment are expected to be minimal. Construction of the project will result in localized impacts to soil and water resources and will be mitigated by implementing BMPs to minimize impacts. Similarly, erosion control practices will be implemented during construction of the substation and wind projects. Wildlife may be temporarily displaced during construction, although quality wildlife habitat is minimal in the project area. Vegetation impacts are expected to be minimal since the transmission lines will be placed at the edge of agricultural fields, and wind turbines will be placed within agricultural fields.

This project could interact with the Three Waters Wind project to result in an increased potential for avian collisions with energy infrastructure. However, these projects intersect in an agricultural area, where transmission line infrastructure is limited and the potential for collisions are low. Furthermore, BMPs, such as bird flight diverters, would be used where necessary to reduce the potential for impacts.

4.15.8 Rare and Unique Natural Resources

The cumulative potential effects on rare and unique natural resources are expected to be minimal. The wind, transmission line, and substation projects are not within federally protected areas and not within critical habitats for threatened or endangered species.

5 Application of Routing Factors to the Project

The Commission is charged with locating transmission lines in a manner that is "compatible with environmental preservation and the efficient use of resources" and that minimizes "adverse human and environmental impact(s)" while ensuring electric power reliability (Minn. Statute 216E.02). Minn. Statute 216E.03, subdivision 7(b) identifies considerations that the Commission must consider when designating transmission lines routes.

Minn. Rule 7850.4100 lists 14 factors for the Commission to consider in its route permitting decisions, including impacts on human settlements, land-based economies, and the natural environment (see Factors Considered by the Commission for Transmission Line Route Permits sidebar). Through an analysis of the routing factors, this chapter presents the merits of the applicant's proposed route.

Many of the project impacts relative to the applicable routing factors are anticipated to be avoided or minimized by the (1) route selection, (2) general and special conditions in the Commission's route permit, (3) prudent transmission structure placement and placement of the alignment within the permitted route, and (4) the requirements of "downstream" permits such as the construction stormwater permit.

The discussion here focuses on the first 12 routing factors (See Minn. Rule 7850.4100, factors A through L). Routing factors M and N— the unavoidable and irreversible impacts of the project—are discussed at the end of this chapter.

Routing factor G ("mitigate adverse environmental impacts") has several parts and speaks generally to environmental impacts. For purposes of discussion here, and with respect to routing factor G, it is assumed that all routing alternatives are equal with regard to maximizing energy efficiencies and accommodating expansion of transmission capacity. With respect to environmental impacts, the examination of such impacts suggested by routing factor G is included in the discussion of other routing factors and elements that more specifically address an environmental impact (e.g., effects on vegetation and wildlife, routing factor E).

Routing factor I, the use of existing large electric power generating plant sites, is not relevant to this project and is not discussed further.

Finally, routing factors H and J address similar issues, the use or paralleling of existing rights-of-way. Routing factor H relates to the use or paralleling of existing rights-of-way but also includes items

Factors Considered by the Commission for Transmission Line Route Permits

To determine whether to issue a route permit for a high-voltage transmission line, the Commission shall consider the following factors of Minnesota Rules, part 7850.4100:

A. Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.

B. Effects on public health and safety.

C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.

D. Effects on archaeological and historic resources.

E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.

F. Effects on rare and unique natural resources.

G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity.

H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.

I. Use of existing large electric power generating plant sites.

J. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way.

K. Electrical system reliability.

L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.

M. Adverse human and natural environmental effects which cannot be avoided.

N. Irreversible and irretrievable commitments of resources.

that do not have a ROW, such as survey lines, natural division lines, and agricultural field boundaries. Routing factor J relates to the use of existing transportation, pipeline, and electrical transmission rights-of-way. Within this chapter, these factors are considered similarly—the use or paralleling of existing rights-of-way and where there is infrastructure that has a ROW. However, the discussion here emphasizes existing transmission line ROW usage as opposed to other infrastructure ROW.

5.1 Applicant's Proposed Route

The potential impacts of the applicant's proposed route are summarized in Table 5-1 and described further in Chapters 5.1.1 through 5.1.6. Those elements with minimal or no potential to be impacted by the project are not discussed in this Chapter.

Table 5-1 Human and Environmental Impacts of the Applicant's Proposed Route

8.5	Element	Applicant's Proposed Route
Length (miles)		8.5
Human Settlement	Residences within 0-50 feet (count)	0
	Residences within 50-250 feet (count)	4
	Residences within 250-500 feet (count)	2
	Residences within 500-1,000 feet (count)	3
Environmental Justice	Communities of EJ concern crossed by the 100-ft ROW (count)	0
Land-Based Economies	Agricultural land in 100-ft ROW (acres) and Forks Switching Station	67
Archaeological and Historic Resources	Archaeological sites in route width (count)	0
	Historic resources in route width (count)	1 (not eligible)
Water Resources	Stream crossings (count)	3
	PWI crossings (count)	2
	Desktop delineated wetland crossings (count)	9
	Total desktop delineated wetlands in 100-foot ROW (acres)	11.05
Vegetation	Forested landcover in 100-foot ROW (acres)	0
Wildlife	Wildlife Management Areas in 100-foot ROW (acres)	0
	Scientific and Natural Areas in 100-foot ROW (acres)	0
	Potential for Federal- or state-protected species in 100-foot ROW (count)	2
ROW Sharing and Paralleling	Transmission line (miles, percent)	0.86 (10)
	Roadway (miles, percent)	8.5 (100)
	Field, parcel, or section lines (miles, percent)	8.5 (100)
	Total ROW sharing and paralleling (miles, percent)	8.5 (100)
Estimated Cost	Total estimated cost (million)	$13.5- $18.8

5.1.1 Human Settlements

Potential impacts on human settlements are assessed through an evaluation of several elements, as discussed in Chapter 4.3. For most of the human settlement elements, project impacts are anticipated to be minimal. Analysis of impacts on human settlements focuses on those elements where impacts have the potential to occur, which for the project includes aesthetics.

5.1.1.1 Aesthetics

Aesthetic impacts are assessed, in part, through a consideration of the existing viewshed, landscape, may change these aesthetic attributes. Determining the relative scenic value or visual importance in any given area depends, in large part, on the values and expectations held by individuals and communities about the aesthetic resource in question.

Based on the project's proximity to residences, aesthetic impacts may occur as a result of the project. Four residences are located between 50 and 250 feet of the applicant's proposed route. The project will result in the introduction of new infrastructure in a relatively rural area. However, aesthetic impacts may be minimized by sharing existing road and 69 kV transmission line rights-of-way. The applicant has also committed to minimizing permanent impacts to the aesthetics and visual character of the area by avoiding and/or minimizing tree clearing and avoiding residential areas to the extent practicable.

5.1.2 Land-Based Economies

Potential impacts to land-based economies are assessed through an evaluation of the elements discussed in Chapter 4.8. The project will minimally impact the majority of elements considered under land-based economies. Potential agricultural impacts that may occur as a result of the project are discussed further.

5.1.2.1 Agriculture

According to the NLCD, there are 55.5 acres of agricultural land within the ROW. This agricultural land is comprised of hay/pastureland and cultivated crop land and equates to 54.4 percent of the total land cover within the ROW. In addition, there are 11.8 acres of agricultural land within the Forks Switching Station. Permanent impacts to agriculture as a result of the project include loss of farmland due to the Forks Switching Station and structure placement in agricultural fields which can restrict certain types of farming equipment. Impacts to agricultural operations have been mitigated by proposing a project that primarily follows existing roadway ROW. Additionally, the applicant will work with landowners regarding compensation for any unintended impacts (e.g., repair of drain tile).

5.1.3 Archaeological and Historic Resources

A review of the MnSHIP portal indicates that there is one previously inventoried historic resources located within the route width, Bridge L9312/JK-RST-00011. This timber slab bridge, constructed in 1970, crosses the Little Sioux River along 770th street. This resource is not eligible for the NRHP (reference (55)). Therefore, the project does not have the potential to alter this resource's setting, feeling, appearance, and/or association.

5.1.4 Natural Environment

Potential impacts to the natural environment are assessed by looking at several specific elements as described in Chapter 4.10. For some of the elements of the natural environment, impacts from the project

are anticipated to be minimal and are therefore not discussed in this Chapter. This Chapter addresses those elements that do have the potential to be impacted by the project – water resources, vegetation, and wildlife.

5.1.4.1 Water Resources

The project crosses two streams that are identified as public waters – Judicial Ditch 28 and the Little Sioux River– as well as one non-public water stream. In addition, nine wetlands totaling approximately 11.05 acres are located in the project ROW. However, it is anticipated that impacts on water courses and wetlands will be avoided by adjusting structure locations to avoid disturbing the streams and wetlands. No stream or wetland crossing will be greater than 1,000 feet, meaning all stream crossings can be spanned to avoid placing a structure within these resources. In addition, the project will develop a SWPPP that identifies BMPs to be implemented during construction to minimize erosion and sedimentation impacts to surface waters. The applicant will also work with the DNR to obtain appropriate approvals for public water crossings.

5.1.4.2 Vegetation

Present-day vegetation consists of herbaceous agricultural vegetation, cultivated crops, hay and pasture land, and developed lands. Project construction will result in short-term impacts on existing vegetation, including localized physical disturbance and soil compaction. Development and use of access roads, staging, and stringing areas for the project will also have short-term impacts on vegetation by concentrating surface disturbance and equipment use. Permanent vegetation clearing will be required in the designated structure installation areas, resulting in an impact area measuring up to 5 feet in diameter for typical structures and up to 12 feet in diameter for dead-end and angle structures. Construction will also result in long-term impacts to vegetation by permanently removing taller-growing woody vegetation within the ROW.

Mitigation will include following existing road ROW, limiting new access road construction, constructing during fall and winter months to limit vegetation damage, leaving or replanting compatible vegetation at the edge of the transmission line ROW, replanting the transmission line ROW outside of active farmed areas with low-growing, native species, and limiting vehicle traffic to roads along the ROW and within previously disturbed areas.

5.1.4.3 Wildlife

Wildlife in the general vicinity consists of songbirds, raptors, and small mammals. In addition, Minnesota is in the Central Flyway of North America. Migratory birds use portions of the Central Flyway as resting grounds during spring and fall migration, as well as breeding and nesting grounds throughout the summer. Within and near the project, there is limited suitable habitat for migratory birds. Migratory birds are protected under the MBTA.

For non-avian wildlife, construction activities that generate noise, dust, or disturbance may result in short-term, indirect impacts. During project construction, wildlife will generally be displaced within the ROW. Potential impacts to avian species (e.g., songbirds, raptors, and waterfowl) include those described for non-avian species, and also include impacts due to electrocution and collision with transmission line conductors. Independent of the electrocution risk, birds may be injured by colliding with transmission line structures and conductors. Collision risk is influenced by several factors including habitat, flyways, foraging areas, and bird size.

The primary mitigation strategy is to avoid disturbing and placing structures within riparian areas and wetlands. Bird collisions with transmission lines can be mitigated by configuring the conductors in a single horizontal plane or through the use of bird flight diverters.

5.1.5 Rare and Unique Natural Resources

There are six documented federally listed species within 1 mile of the applicant's proposed route. The northern long-eared bat and tricolored bat have the potential to be within the 100-foot ROW and, if present, could potentially be directly impacted by the project if trees are removed during the active nesting period. Impacts on northern long-eared bats and tricolored bats could be minimized by conducting clearing tree activities while the bats are hibernating during their inactive season and avoiding tree removal from June 1 through August 15.

5.1.6 Use of Existing Rights-of-Way

Sharing ROW with existing infrastructure minimizes fragmentation of the landscape and can minimize human and environmental impacts (e.g., aesthetic and agricultural impacts). The project shares ROW for the entire length of the project; the ROW for the route will be shared with the existing road ROW along 350th Ave, 780th St., 360th Ave, and 770th St.

5.2 Summary of Project-Specific Routing Factors

The discussion here uses text and a color graphic to summarize the relative merits of the applicant's proposed route (Table 5-2). The color graphic and related notes for a specific routing factor or element are not meant to suggest that accommodations and/or changes need to be made to the route but are provided as a relative comparison to be evaluated together with all other routing factors. For example, if the applicant's proposed route is "red" for a particular factor or element, this is not meant to indicate a fatal flaw within the proposed route.

For routing factors that express the state of Minnesota's interest in the efficient use of resources (e.g., the use and paralleling of existing rights-of-way), the graphic represents the consistency of the route with these interests. For the remaining routing factors, the graphic represents the magnitude of the anticipated impacts.

Table 5-2 Guide to Relative Merits of the Applicant's Proposed Route

Anticipated Impacts or Consistency with Routing Factor	Symbol
Minimal: Impacts are anticipated to be minimal with mitigation – OR – route option is very consistent with this routing factor.	
Moderate: Impacts are anticipated to be minimal to moderate with mitigation; special permit conditions may be required for mitigation – OR – the route may not be the least impactful with respect to the routing factor.	
Significant: Impacts are anticipated to be moderate to significant and likely unable to be mitigated – OR – route alternative is not consistent with the routing factor or consistent only in part. Indicates that the route is impactful with respect to the routing factor.	

5.2.1 Routing Factors for which Impacts are Anticipated to be Minimal

Potential impacts are anticipated to be minimal for the following routing factors and elements:

- Impacts on human settlements (factor A) – displacement, environmental justice communities, noise, property values, electronic interference, cultural values, zoning and land-use compatibility, and public services.
- Impacts on public health and safety (factor B) – EMF, implantable medical devices, stray voltage, induced voltage, and air quality.
- Impacts on land-based economies (factor C) – forestry, mining, and recreation and tourism.
- Impacts on archaeological and historic resources (factor D).
- Impacts on rare and unique natural resources (factor F) – federal- and state-protected species.
- Impacts on electric system reliability (factor K).
- Costs that are dependent on design and route (factor L).

5.2.2 Routing Factors for which Impacts may be Minimal to Moderate

Potential impacts are anticipated to be minimal to moderate for the following routing factors and elements:

- Impacts on human settlements (factor A) – aesthetics.
- Impacts on land-based economies (factor C) – agriculture
- Impacts on the natural environment (factor E) – water resources, vegetation (flora), and wildlife (fauna).
- Impacts on rare and unique natural resources (factor F) – sensitive ecological resources.
- Use or paralleling of existing rights-of-way (factors H and J).

The relative merits of the applicant's proposed route is included in Table 5-3.

Table 5-3 Summary of Routing Factors for the Applicant's Proposed Route

Routing Factor/Resource	Applicant's Proposed Route	Summary
A. Human Settlement – Displacement, Noise, Aesthetics, Cultural Values, Recreation, and Public Services		There are four residences located between 50 and 250 feet of the applicant's proposed route. Some tree clearing along the ROW may occur. The project will result in a viewshed change for the area.
B. Public Health and Safety		No impacts to public health and safety are anticipated as a result of the project.

Routing Factor/Resource	Applicant's Proposed Route	Summary
C. Land-based Economies – Agriculture, Forestry, Tourism, and Mining		Permanent impacts to agriculture as a result of the project may include loss of farmland due to construction of the Forks Switching Station and structure placement in agricultural fields and restriction of farming equipment. Impacts to agricultural operations have been mitigated by proposing a project that follows existing roadway ROW entirely.
D. Archaeological and Historic Resources		No impacts to archaeological and historic resources are anticipated as a result of the project.
E. Natural Environment – Air and Water Quality Resources and Flora and Fauna		Impacts to water courses and wetlands will be avoided by adjusting structure locations to avoid impacting streams and wetlands. Project construction will result in short- and long-term impacts to existing vegetation. Short-term impacts to non-avian wildlife may occur. Avian electrocution and/or collision may occur as a result of the project.
F. Rare and Unique Natural Resources		The project may result in impacts to northern long eared bats if they are present in the ROW; however, this can be mitigated by conducting clearing activities while the bats are hibernating during their inactive season and avoiding tree removal from June 1 through August 15.
G. Application of Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and could Accommodate Expansion of Transmission or Generating Capacity		The project has been designed to maximize energy efficiencies and mitigate adverse environmental effects.
H. Use or Paralleling of Existing Rights-of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries		The project parallels existing road ROW for 100 percent of its length.
J. Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-of-Way		The project parallels existing road ROW for 100 percent of its length.
K. Electrical System Reliability		The project supports electrical system reliability.
L. Costs of Construction, Operating, and Maintaining the Facility which are Dependent on Design and Route		The project has been designed to minimize construction and operating costs to the extent possible.
M. Adverse Human and Natural Environmental Effects which Cannot be Avoided		Unavoidable adverse human and environmental effects have been minimized to the extent possible.
N. Irreversible and Irretrievable Commitments of Resources		Irreversible and irretrievable commitments of resources have been minimized to the extent possible.

5.3 Unavoidable Impacts

Transmission lines are large infrastructure projects that can have adverse human and environmental impacts. Even with mitigation strategies, there are adverse project impacts that cannot be avoided.

Aesthetic impacts cannot be avoided. The project will introduce new transmission line structures, conductors, and a switching station into project area viewsheds. These project features will be visible; therefore, they will have an adverse aesthetic impact, though it will be minimized by paralleling existing infrastructure. Temporary construction-related impacts also cannot be avoided. These include construction-related noise and dust generation and disruption of traffic near construction sites.

While the project will parallel existing infrastructure to the extent practicable, impacts on agriculture cannot be completely avoided. The project requires the construction of the Forks Switching Station, the placement of concrete footings, and the construction of transmission line structures on agricultural land. Potential impacts include loss of tillable acreage and constraints on the layout and management of field operations.

Finally, impacts on the natural environment cannot be avoided. Even if impacts can be limited to the transmission line's ROW, construction and operation of the transmission line will require minor tree removal and brush trimming, as well as clearing at structure sites. These are unavoidable impacts on vegetation. Transmission line conductors can adversely affect avian species by creating opportunities for collisions with the conductors. These collisions could occur despite mitigation strategies such as the use of bird flight diverters.

5.4 Irreversible and Irretrievable Impacts

The commitment of a resource is irreversible when it is impossible or very difficult to redirect that resource for a different future use. An irretrievable commitment refers to the use or consumption of a resource such that it is not recoverable for later use by future generations. These types of commitments are anticipated to occur for the project.

The commitment of land for a transmission line ROW is likely an irreversible commitment. In general, lands in the rights-of-way of large infrastructure projects such as railroads, highways, and transmission lines remain committed to these projects for a relatively long period of time.

Even in instances where a ROW is abandoned, the land within the ROW is typically repurposed for a different infrastructure use, such as a rails-to-trails program, and is not returned to a previous land use. This said, transmission line rights-of-way can be returned to a previous use (e.g., row crop, pasture) by the removal of structures and structure foundations to a depth that supports this use.

There are few commitments of resources associated with the project that are irretrievable. These commitments include the steel, concrete, and hydrocarbon resources committed to the project, though it is possible that the steel could be recycled at some point in the future. Labor and fiscal resources required for the project are also irretrievable commitments.

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Appendices

Appendix A

Project Scoping Decision

COMMERCE DEPARTMENT

In the Matter of the Application of ITC Midwest LLC for a Route Permit for the Forks 161 kV Switching Station and Forks-Rost Transmission 161 kV Transmission Line in Jackson County, Minnesota

ENVIRONMENTAL ASSESSMENT SCOPING DECISION

DOCKET NO. ET-6675/TL-24-232

The above matter has come before the Commissioner of the Department of Commerce (Department) for a decision on the scope of the environmental assessment (EA) that will be prepared for the Forks 161 kV Switching Station and Forks-Rost 161 kilovolt (kV) transmission line project proposed by ITC Midwest LLC (applicant) in Jackson County, Minnesota.

Project Description

On September 30, 2024, ITC Midwest LLC ("ITC" or "applicant"), filed a route permit application for the Forks 161 kV Switching Station and Forks-Rost 161 kV Transmission Line Project in Jackson County, Minnesota.[1] The project includes construction of approximately 8.5 miles of new 161 kV transmission line starting at a new Rost Substation and terminating at a new Forks Switching Station. The new 161 kV transmission line and Forks Switching Station will be constructed by ITC Midwest. The Rost Substation will be permitted and constructed separately by GRE.[2]

The 161 kV transmission line will consist of a single-circuit, braced post monopole steel structures, spaced approximately 600 to 800 feet apart. ITC is requesting a route width of up to 1,500 feet (750 feet on either side of the proposed transmission line centerline) to provide flexibility to make alignment adjustments during the final right-of-way design to work with landowners, to avoid sensitive natural resources, and to manage construction constraints as necessary. Within the route, the transmission line will require a right-of-way width of 100 feet (typically 50 feet on each side of the transmission line centerline) and in some cases up to 150 feet wide.[3]

Project Purpose

The applicant indicates that the proposed project is the result of a joint study between ITC Midwest, Great River Energy (GRE) and Missouri River Energy Services (MRES) to determine long-term reliability and load serving needs for the Worthington area and to identify potential upgrades that may be needed to the transmission system for area reliability.

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[1] Route Permit Application for the Forks 161 kV Switching Station and Forks-Rost 161 kV Transmission Line Project, ITC Midwest LLC, September 30, 2024, eDockets Numbers – Filing Letter 20249-210581-01; Application (Text) and Appendix A (Completeness Checklist) 20249-210581-02; Appendix B (Project Route Maps); 20249-210581-03, 20249-210581-04; Appendices C (90-day Pre-Application Letter to Local Units of Government) & D (Notice of Intent to File a Route Permit Application Under the Alternative Route Permit Process) 20249-210581-05; Appendix E (Wetland and Other Waters Delineation Report) Part 1 of 2; 20249-210581-06; Part 2 0f 2; 20249-210581-07; Appendix F (Agency and Tribal Outreach) 20249-210581-08; Appendix G (Natural Heritage Information System, USFWS Species List and Phase 1a Cultural Resources Literature Search) Trade Secret (4 parts) 20249-210582-01, 20249-210582-02; 20249-210582-03 and 20249-210582-04; Public Part 20249-210582-05; Appendix H (Open House Materials), Appendix I (Affected Landowner List), Appendix J (Agricultural Impact Mitigation Plan) and Appendix K (Vegetation Management Plan) 20249-210582-06;

[2] Id. Page 6.

[3] Id. P. 7.

The existing transmission configuration in the Worthington area leaves the system susceptible to low voltage conditions when certain transmission facilities are out of service. The Forks-Rost 161 kV transmission line and Forks Switching Station are components of an overall plan with complementary projects that will ensure electrical reliability and resilience in the area's transmission system.[4]

Regulatory Background

In Minnesota, no person may construct a high voltage transmission line without a route permit from the Commission. A high voltage transmission line is defined as a conductor of electric energy designed for and capable of operation at a voltage of 100 kV or more and greater than 1,500 feet in length. The proposed project will consist of approximately 8.5 miles of 161 kV transmission line and therefore requires a route permit from the Commission.

Department Energy Environmental Review and Analysis (EERA) staff is responsible for conducting environmental review of route permit applications on behalf of the Commission.[5] EERA staff will prepare an environmental assessment (EA) that will inform Commission decisions on the applicant's route permit application. The first step in preparing the EA is scoping. The purpose of scoping is to provide citizens, local governments, tribal governments, and agencies an opportunity to focus the EA on those issues and alternatives that are relevant to the proposed project.

Scoping Process

The EA scoping process has two primary purposes: (1) to gather public input on the impacts, mitigation measures, and alternatives to study in the EA, and (2) to focus the EA on those impacts, mitigation measures, and alternatives that will aid in the Commission's decision on the route permit. EERA staff gathered input on the EA scope through two public meetings and an associated comment period. This scoping decision identifies potential impacts and mitigation measures that will be analyzed in the EA.

Public Scoping Meetings

Commission and EERA staff held two public information and EA scoping meetings. One meeting was in-person, and one meeting was virtual. The in-person meeting was held on Wednesday, December 4, 2024, at the Lakefield Community Center, Lakefield, Minnesota. Approximately 20 members of the public attended this meeting. The virtual meeting was held on Wednesday, December 10, 2024. One member of the public attended the virtual meeting.

Public Meeting Comments (December 4, 2024)

The following individuals provided comments and are summarized as follows:

John Dorn

Mr. Dorn inquired about liability in the event of an incident associated with infrastructure project on a landowner's property.[6]

[4] Application, part 1.4, page 3, See eDocket No. 20249-210581-02.
[5] Minnesota Statute 216E.04.
[6] Scoping Comments [eDocket No. 202412-213293-01 , p. 23]

Fred Diemer
Mr. Diemer inquired about electric and magnetic field standards and health effects associated with transmission lines.[7]

Shawna Diemer
Ms. Diemer inquired as to where they can locate studies on electric and magnetic fields.[8]

Virtual Meeting (December 10, 2024)

Roger Pohlman
Mr. Pohlman (Jackson County Commissioner), inquired about the acceptable distance from people's homes and residences to the transmission line. Mr. Pohlman also addressed drainage ditches and field drainage for farmers and asked if damage to agricultural fields would be repaired or farmers compensated.[9]

Written Comments

A 36-day comment period, which began on November 19, 2024, and closed on December 24, 2024, provided the public an opportunity to submit comments to EERA staff on potential impacts and mitigation measures for consideration during the EA scope development process.

The Minnesota Department of Natural (MnDNR) provided comments,[10] including an attachment from the Minnesota Natural Heritage information System.[11] Comments from MDNR noted the following:

1. The presence of a calcareous fen in the project area. MnDNR requested that the applicant prepare a calcareous fen management plan if the project will impact the fen.
2. The possible need for flight diverters at river crossings, fragmented forested patches and near lakes and wetlands.
3. The need to utilize downlit and shielded lighting to minimize blue hue, if the project requires lighting.
4. Avoidance of products containing calcium chloride or magnesium which are used for dust control.
5. The use of erosion control blankets should be limited to "bio-netting" or "natural netting" types, and specifically not products containing plastic mesh netting or other plastic components.

[7] *Id*., p. 29.
[8] *Id*., p. 29.
[9] Scoping Comments [eDocket No. 202412-213294-01, p. 21]
[10] Minnesota Department of Natural Resources, [eDocket No. 202412-213319-01].
[11] MnDNR-Natural Heritage Information System, [eDocket No.202412-213319-02].

Route and Route Segment Proposals

No commenters proposed any new route or route segments for consideration in the EA. EERA staff is not proposing any modifications to ITC Midwest's proposed transmission line route.

Commission Review

On January 8, 2025, EERA staff provided the Commission with a summary of the EA scoping process.[12] The summary noted that no route alternatives were proposed during the scoping process and recommended that the EA evaluate solely the route proposed by the applicant. On January 21, 2025, the Commission agreed with EERA staff and authorized EERA to include only the applicant's proposed route for analysis in the EA.[13]

HAVING REVIEWED THE MATTER, consulted with Department staff, and in accordance with Minnesota Rule 7850.3700, I hereby make the following scoping decision:

MATTERS TO BE ADDRESSED

The issues outlined below will be analyzed in the EA for the proposed ITC Midwest Forks-Rost 161 kV transmission line project. The EA will describe the project and the human and environmental resources of the project area and will provide information on the potential project impacts as they relate to the topics outlined in this scoping decision, as well as possible mitigation measures. It will identify impacts that cannot be avoided, irretrievable commitments of resources, as well as permits from other government entities that may be required for the project. The EA will discuss the relative merits of the applicant's proposed route using the routing factors found in Minnesota Rule 7850.4100.

I. GENERAL DESCRIPTION OF THE PROJECT

- A. Project Description
- B. Project Purpose
- C. Route Description
  1. Route Width
  2. Right-of-Way
- D. Project Costs

II. REGULATORY FRAMEWORK

- A. High Voltage Transmission Line Route Permit
- B. Environmental Review Process
- C. Other Permits and Approvals

[12] January 8, 2024, Minnesota Department of Commerce, EERA Comments and Recommendations on the Scoping Process and Routing Alternatives for the Forks-Rost 161 kV Transmission Line Project [eDocket No. 20251-213673-01].
[13] Commission Order, January 21, 2025, [eDocket No. 20251-214165-01].

III. ENGINEERING AND DESIGN

A. Transmission Line Structures
B. Transmission Line Conductors

IV. CONSTRUCTION

A. Right-of-Way Acquisition
B. Construction
C. Restoration
D. Damage Compensation
E. Operation and Maintenance

V. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

The EA will include a discussion of the human and environmental resources potentially impacted by the proposed project and the routing alternatives described herein (Section VI). Potential impacts, both positive and negative, of both the project and each alternative will be described. The EA will describe mitigation measures that could reasonably be implemented to reduce or eliminate the identified impacts. The EA will also describe any unavoidable impacts resulting from proposed project implementation.

The EA data and analyses will be commensurate with the importance of potential impacts and the relevance of the information for consideration of mitigation measures. Additionally, EERA staff will consider the relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the EA. Less important material may be summarized, consolidated, or simply referenced.

If relevant information cannot be obtained within timelines prescribed by statute and rule, or if the costs of obtaining such information is excessive, or the means to obtain it is not known, EERA staff will include a statement in the EA that such information is incomplete or unavailable and the relevance of that information in evaluating potential impacts.

A. Environmental Setting
B. Human Settlements
    1. Noise
    2. Aesthetics
    3. Displacement
    4. Property Values
    5. Socioeconomics / Environmental Justice
    6. Zoning and Land Use Compatibility
    7. Public Services
    8. Electronic Interference
C. Public Health and Safety
    1. Electric and Magnetic Fields
    2. Implantable Medical Devices
    3. Stray Voltage
    4. Induced Voltage

D. Land Based Economies
    1. Agriculture
    2. Forestry
    3. Mining
    4. Recreation and Tourism
E. Archaeological and Historic Resources
F. Natural Environment
    1. Air Quality
    2. Climate Change and Project Climate Change Resilience
    3. Water Resources
    4. Soils
    5. Vegetation
    6. Wildlife
G. Threatened / Endangered / Rare and Unique Natural Resources
H. Electric System Reliability
I. Operation and Maintenance Costs that are Design Dependent
J. Adverse Impacts that Cannot be Avoided
K. Irreversible and Irretrievable Commitments of Resources
L. Cumulative Potential Effects

VI. ROUTES AND ROUTE ALTERNATIVES TO BE EVALUATED IN THE ENVIRONMENTAL ASSESSMENT

The EA will evaluate the route proposed in the applicant's route permit application.

VII. IDENTIFICATION OF PERMITS

The EA will include a list and description of permits from other government entities that may be required for the proposed project.

ISSUES OUTSIDE THE SCOPE OF THE ENVIRONMENTAL ASSESSMENT

The EA will not consider the following:

A. Any route, route segment, or alignment alternative not specifically identified for study in this scoping decision.
B. Policy issues concerning whether utilities or local governments should be liable for the cost to relocate utility poles when roadways are widened.
C. The way landowners are paid for transmission line right-of-way easements.

SCHEDULE

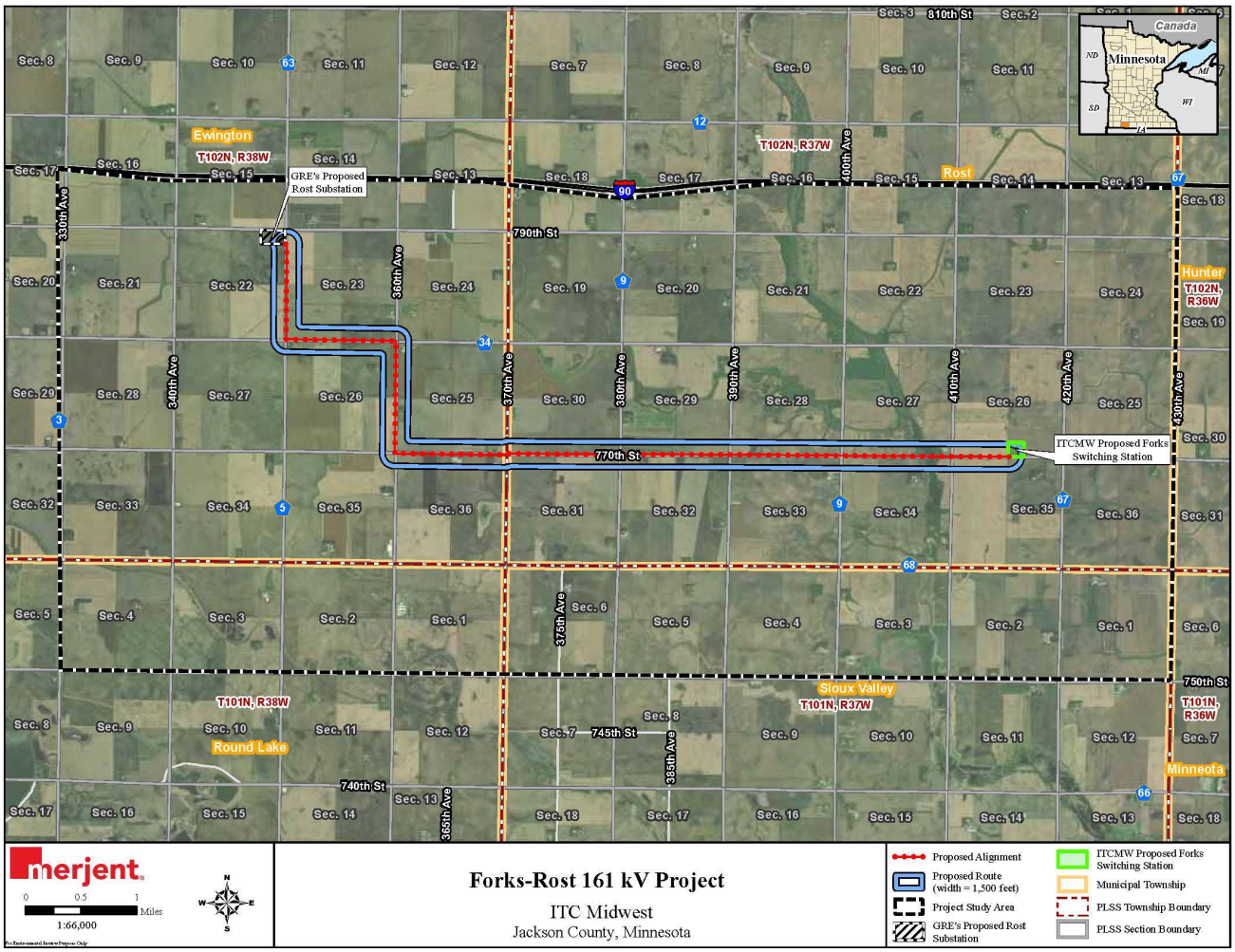
The EA is anticipated to be completed and available in May 2025. Public hearings will be held in the project area after issuance of the EA. Comments on the EA may be submitted into the hearing record.

Signed this 10th day of February, 2025

STATE OF MINNESOTA
DEPARTMENT OF COMMERCE

_____
Pete Wyckoff, Deputy Commissioner

Project Overview Map



CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

Minnesota Department of Commerce
Environmental Assessment Scoping Decision

Docket No. ET6675/TL-24-232

Dated this **13th** day of **February 2025**

/s/Sharon Ferguson

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Katherine	Arnold	katherine.arnold@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
2	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
3	Bret	Eknes	bret.eknes@state.mn.us		Public Utilities Commission	Suite 350 121 7th Place East St. Paul MN, 55101-2147 United States	Electronic Service		No	24-232Official CC Service List
4	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	24-232Official CC Service List
5	Valerie	Herring	vherring@taftlaw.com	Taft Stettinius & Hollister LLP		2200 IDS Center 80 S. Eighth Street Minneapolis MN, 55402 United States	Electronic Service		No	24-232Official CC Service List
6	Raymond	Kirsch	raymond.kirsch@state.mn.us		Department of Commerce	85 7th Place E Ste 500 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
7	James	Mortenson	james.mortenson@state.mn.us		Office of Administrative Hearings	PO BOX 64620 St. Paul MN, 55164-0620 United States	Electronic Service		Yes	24-232Official CC Service List
8	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		No	24-232Official CC Service List
9	Mark	Rothfork	mrothfork@itctransco.com	ITC Midwest LLC		100 East Grand Ave, Suite 360 Des Moines IA, 50309 United States	Electronic Service		No	24-232Official CC Service List
10	Will	Seuffert	will.seuffert@state.mn.us		Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
11	Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix & Associates		7400 Lyndale Avenue South Suite 190 Richfield MN, 55423 United States	Electronic Service		Yes	24-232Official CC Service List

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name

Appendix B

Spatial Data Sources

Forks-Rost Transmission Line Project
Spatial Datasources

Responsible	Dataset	Source Link	Date_Recvd	In Project Area Y/N
BWSR	State Conservation Easements	https://gisdata.mn.gov/dataset/plan-stateland-dnr	3/17/2025	N
BWSR	RIM Conservation Easements	https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements	3/17/2025	N
DNR	Consolidated Conservation & School Trust Lands	https://gisdata.mn.gov/dataset/plan-stateland-dnr	3/17/2025	N
DNR	MBS Railroad Right-of-Way Prairies	https://gisdata.mn.gov/dataset/biota-mcbs-railroad-prairies	3/17/2025	N
DNR	DNR Native Prairies	https://gisdata.mn.gov/dataset/biota-dnr-native-prairies	3/17/2025	N
DNR	MBS Sites of Biodiversity Significance	https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity	3/17/2025	Y
DNR	MBS Native Plant Communities by Type	https://gisdata.mn.gov/dataset/biota-dnr-native-plant-comm	3/17/2025	Y
DNR	MN DNR Scientific and Natural Areas	https://gisdata.mn.gov/dataset/bdry-scientific-and-nat-areas	3/17/2025	Y
DNR	Calcareous Fens	https://gisdata.mn.gov/dataset/biota-nhis-calcareous-fens	3/17/2025	N
DNR	DNR Forest Stand	https://gisdata.mn.gov/dataset/biota-dnr-forest-stand-inventory	3/17/2025	N
DNR	Wetland Banking Easement	https://gisdata.mn.gov/dataset/bdry-wetland-banking-easements	3/17/2025	N
DNR	MDNR Old growth stands	https://gisdata.mn.gov/dataset/biota-dnr-forest-inv-old-growth	3/17/2025	N
USFWS	Rusty Patched Bumble High Potential Zones	https://www.arcgis.com/home/item.html?id=b2e7e0c1ddad4f50a20bcfc1bfcfbbcb https://gis-fws.opendata.arcgis.com/	3/17/2025	N
DNR	Lakes of Biological Significance	https://gisdata.mn.gov/dataset/env-lakes-of-biological-signific	3/17/2025	N
HDR	Residences	I:\Projects\23\23\1019\Original_Source_Data\HDR\2025_01_31	3/17/2025	Y
GNIS	Churches	https://www.arcgis.com/home/item.html?id=ce731871e955437dac62f659f5ab5805	3/17/2025	Y
MDE	Schools (Public & Private, > Kindergarten)	https://gisdata.mn.gov/dataset/struc-school-buildings	3/17/2025	N
MDHS	Daycares/Child-care centers/Pre-schools	https://gisdata.mn.gov/dataset/econ-child-care	3/17/2025	N
MDH	Hospitals	https://gisdata.mn.gov/dataset/health-facility-hospitals	3/17/2025	N
MDH	Nursing Homes	https://gisdata.mn.gov/dataset/health-facility-nursing-boarding	3/17/2025	N
Jackson County	Zoning	https://www.co.jackson.mn.us/maps	3/17/2025	Y
MNDOT	Airport/Heliport Locations	https://gisdata.mn.gov/es/dataset/trans-airports	3/17/2025	N
MNDOT	Undocumented or Private Airstrips	https://gisdata.mn.gov/es/dataset/trans-airports	3/17/2025	Y
SHPO	Historic Sites from SHPO	https://geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	Y
SHPO	MnSHIP Historic Property Points	https://geocrm.gisdata.mn.gov/arcgis/rest/login?redirect=https%3A//geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	Y
SHPO	MnSHIP Historic Property Lines	https://geocrm.gisdata.mn.gov/arcgis/rest/login?redirect=https%3A//geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	N
SHPO	MnSHIP Historic Property Polygons	https://geocrm.gisdata.mn.gov/arcgis/rest/login?redirect=https%3A//geocrm.gisdata.mn.gov/arcgis/rest/services/MnSHIP_public_external/HistoricProp_public_wfs/FeatureServer	3/17/2025	N
MNIT	Communication Towers	https://gisdata.mn.gov/dataset/util-fcc	3/17/2025	Y
MNDOT	Native American Reservation Lands	https://www.arcgis.com/home/item.html?id=8fded139728f48b3b374a5dbf41dd4ec	3/17/2025	N
MNDOT	Military Reservation Lands	https://www.arcgis.com/home/item.html?id=6b911a60a5a4465a85fd5c42668bf907	3/17/2025	N
MNDOT	Aggregate Sources	https://www.dot.state.mn.us/materials/asis_GE.html	3/17/2025	Y
DNR	Mineral Leases (Active vs. Ever Offered)	https://gisdata.mn.gov/dataset/plan-state-minleases	3/17/2025	N
UMN	Minnesota Law Enforcement Locations	https://umn.maps.arcgis.com/apps/mapviewer/index.html?layers=ed4469ef539440529daad12013af4bc6	3/17/2025	N
UMN	Minnesota Fire Stations	https://umn.maps.arcgis.com/apps/mapviewer/index.html?layers=678dc7e3a5054456a145ab4e7671abbf	3/17/2025	N
USDA	SSURGO Prime Farmland	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Hydric soils	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Soil map unit symbol	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Soil map unit name	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	SSURGO Erosion Hazard (Off-Road, Off-Trail)	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USGS	NLCD 2022	https://www.usgs.gov/centers/eros/science/national-land-cover-database	3/17/2025	Y
DNR	DNR State Trails	https://gisdata.mn.gov/dataset/trans-state-trails-minnesota	3/17/2025	N
DNR	DNR State Park Trails	https://gisdata.mn.gov/dataset/trans-state-park-trails-roads	3/17/2025	N
DNR	State Forest Camp Grounds	https://gisdata.mn.gov/dataset/struc-state-forest-campgrounds	3/17/2025	N
DNR	Campsites	https://gisdata.mn.gov/dataset/struc-parks-and-trails-campsites	3/17/2025	N
DNR	County/Local Trails	https://gisdata.mn.gov/dataset/trans-state-park-trails-roads	3/17/2025	N
Jackson County	County/Local Parks	https://www.co.jackson.mn.us/maps	3/17/2025	N
DNR	State Parks	https://gisdata.mn.gov/dataset/bdry-dnr-lrs-prk	3/17/2025	N
DNR	State Forests	https://gisdata.mn.gov/dataset/bdry-state-forest	3/17/2025	N
USFW	National Forest	https://gis-fws.opendata.arcgis.com/	3/17/2025	N
USFW	National Parks	https://gis-fws.opendata.arcgis.com/	3/17/2025	N
MNDOT	Scenic Byways	https://gisdata.mn.gov/dataset/trans-routes-tour	3/17/2025	N
DNR	Snowmobile Trails 2024-2025 Season	https://gisdata.mn.gov/dataset/trans-snowmobile-trails-mn	3/17/2025	N
DNR	Water Access Points	https://gisdata.mn.gov/dataset/loc-water-access-sites	3/17/2025	N
DNR	MN DNR State Water Trails	https://gisdata.mn.gov/dataset/trans-water-trails-minnesota	3/17/2025	N
DNR	Hunter Walking Trails	https://gisdata.mn.gov/dataset/trans-hunter-walking-trails	3/17/2025	N
DNR	Wild and Scenic River District	https://gisdata.mn.gov/dataset/bdry-wild-and-scenic-river-admin	3/17/2025	N

Forks-Rost Transmission Line Project
Spatial Datasources

Responsible	Dataset	Source Link	Date_Recvd	In Project Area Y/N
DNR	Hunter Walking Trails	https://gisdata.mn.gov/dataset/trans-state-park-trails-roads	3/17/2025	N
MPCA	MPCA What's in My Neighborhood Sites	https://gisdata.mn.gov/dataset/env-my-neighborhood	3/17/2025	Y
MDH	MDH Wellhead protection area	https://gisdata.mn.gov/dataset/water-wellhead-protection-areas	3/17/2025	N
MDH	MDH County Well Index	https://gisdata.mn.gov/dataset/water-well-information-non-pws	3/17/2025	Y
FEMA	FEMA Floodplain / Flood Hazard Areas	https://msc.fema.gov/portal/advanceSearch	3/17/2025	N
MPCA	MPCA Impaired Streams	https://gisdata.mn.gov/dataset/env-impaired-water-2024-draft	3/17/2025	N
MPCA	MPCA Impaired Lakes	https://gisdata.mn.gov/dataset/env-impaired-water-2024-draft	3/17/2025	N
USGS	NHD Flowlines	https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/NHD/State/GDB/	3/17/2025	Y
USGS	NHD Waterbodies	https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/NHD/State/GDB/	3/17/2025	Y
DNR	Public Water Inventory Streams	https://gisdata.mn.gov/dataset/water-mn-public-waters	3/17/2025	Y
DNR	Public Water Inventory Basins/Wetlands	https://gisdata.mn.gov/dataset/water-mn-public-waters	3/17/2025	Y
DNR	Trout Streams	https://gisdata.mn.gov/dataset/env-trout-stream-designations	3/17/2025	N
DNR	Trout Lakes	https://gisdata.mn.gov/dataset/env-trout-lake-designation	3/17/2025	N
DNR/USFWS	NWI (MN Update)	https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014	3/17/2025	Y
DNR	MN DNR Shallow Lakes	https://gisdata.mn.gov/dataset/water-shallow-lakes-id-by-wldlif	3/17/2025	N
DNR	MN DNR Wildlife Lakes	https://gisdata.mn.gov/dataset/env-designated-wildlife-lakes	3/17/2025	N
DNR	Outstanding Resource Value Waters	https://gisdata.mn.gov/dataset/env-orv-waters	3/17/2025	N
DNR	Minnesota Spring Inventory	https://files.dnr.state.mn.us/waters/groundwater_section/mapping/cga/c08_fillmore/pdf_files/plate09.pdf	3/17/2025	N
DNR	MN DNR State Wildlife Management Areas	https://gisdata.mn.gov/dataset/bdry-dnr-wildlife-mgmt-areas-pub	3/17/2025	Y
USFWS	MN DNR Waterfowl Production Area	https://hub.arcgis.com/datasets/fedmaps::waterfowl-production-areas/explore?location=44.481474%2C-97.583468%2C9.66	3/17/2025	Y
DNR	MN DNR State Aquatic Management Areas	https://gisdata.mn.gov/dataset/plan-mndnr-fisheries-acquisition	3/17/2025	N
DNR	MN DNR State Game Refuges	MN State Game Refuges Boundaries	3/17/2025	Y
DNR	MN DNR Migratory Fowl Feeding and Resting Areas	https://gisdata.mn.gov/dataset/env-migratory-waterfowl-areas	3/17/2025	Y
USFWS	National Wildlife Refuge	https://www.fws.gov/service/national-wildlife-refuge-system-gis-data-and-mapping-tools https://gis-fws.opendata.arcgis.com/datasets/fws::fws-national-realty-tracts-simplified/explore	3/17/2025	N
USFWS	USFWS Interests	https://catalog.data.gov/dataset/fws-cadastral-geodatabase-external-facing-e829d	3/17/2025	N
Audubon	Audobon Society Important Bird Areas	https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50	3/17/2025	N
USFWS	Grassland Bird Conservation Areas	https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50	3/17/2025	N
Audubon	Gray Owl Management Area	https://www.arcgis.com/home/webmap/viewer.html?webmap=3b3d225539f8449daf84be6aa89eab50	3/17/2025	N
Merjent	Pipelines	Pipeline Dataset	3/27/2025	Y
Merjent	transmission lines	Transmission Line Dataset	2/27/2025	Y
USDA	Surface texture (sandy loam, loam, silt loam, muck, etc.) – acres by type	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	Rutting Hazard (Slight, Moderate, Severe) – acres by category	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	Highly Erodible soil (by Water) – acres highly erodible by water	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
USDA	Highly Erodible soil (by Wind) – acres highly erodible by wind	https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx	3/17/2025	Y
Merjent	Residences	Residences Dataset	2/27/2025	Y
Merjent	Churches	Churches Dataset	2/27/2025	Y
Merjent	Out Building	Out Building Dataset	2/27/2025	Y
Merjent	Junk Yard	Junk Yard Dataset	2/27/2025	Y
Merjent	Desktop Delineated Wetlands	Desktop Delineated Wetlands Dataset	3/27//2025	Y
MNPUC	Three Rivers Wind Project	https://mn.gov/eera/web/project-file/11326/	3/17/2025	Y

Appendix C

Master Data Tables

	Centerline	ROW	Route Width	Residences					Non-Residential Structures				
				Within 50 ft (ROW)	Within 250 ft	Within 500 ft	Within 1,000 ft	Total	Within 50 ft (ROW)	Within 250 ft	Within 500 ft	Within 1,000 ft	Total
Route	Length (mi)	Area (ac)	Area (ac)	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count
Applicant's Proposed Route	8.4	102.1	1562.2	0	4	2	3	9	0	6	20	33	59

	Archaeological Resources				Historic Resources				National Landcover Dataset					Geology	
									Agriculture	Developed	Barren Land	Open Land	Herbaceous	Sink Holes	Karst Topography
	Within 50 ft (ROW)	Within Route Width	Within 1 mi	Total	Within 50 ft (ROW)	Within Route Width	Within 1 mi	Total	Within 50 ft (ROW)	Within 50 ft (ROW)	Within 50 ft (ROW)	Within 50 ft (ROW)	Within 50 ft (ROW)	Within Route Width	Within Route Width
Route	Count	Count	Count	Count	Count	Count	Count	Count	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Count	Area (ac)
Applicant's Proposed Route	0	0	0	0	1	1	4	6	55.5	45.0	0	0.0	0.4	0	0.0

	MN Department of Health County Well Index		National Hydrography Dataset Waterbodies			National Hydrography Dataset Watercourses			National Wetland Inventory Wetlands				Public Water Inventory Streams		
									All		Non Forested				
	Within 50 ft (ROW)	Within Route Width	Crossing	Within 50 ft (ROW)	Within Route Width	Crossing	Within 50 ft (ROW)	Within Route Width	Crossing (> 1,000 ft span)	Crossing (< 1,000 ft span)	Within 50 ft (ROW)	Within Route Width	Crossing	Within 50 ft (ROW)	Within Route Width
Route	Count	Count	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)	Count	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)
Applicant's Proposed Route	0	1	0	0	0	3	321.5	6,226.7	0	4	0	16	2	216.3	4,322.3

	Right-of-Way Paralleling / Sharing by Type											
	Rail		Road		Transmission Line		Rail, Road, or Transmission Line		Parcel, Section, or Field		Total Paralleling / Sharing	
	Length		Length		Length		Length		Length		Length	
Route	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent	Length (mi)	Percent
Applicant's Proposed Route	0.0	0	8.4	100	0.0	0	8.4	100	8.4	100	8.4	100

Appendix D

Property Values

Property Value Supplement

Attempts to correlate proximity to transmission lines with impacts to property values are complicated by the interaction of several relevant factors, including geographic region, land use, variability in perceptions over time, and limited sales data for similar properties before and after the construction of transmission lines. Researchers have generally used survey-based techniques and statistical analyses to make inferences and draw conclusions about the relationship between transmission lines and property values. In general, surveys provide useful insights for estimating price effects based on public opinion, yielding what researchers refer to as "stated preferences." Statistical analyses, on the other hand, reflect the actual behavior of property buyers and sellers in terms of recorded sales prices, providing what researchers refer to as the "revealed preferences." In other words, there is often incongruity between what people think and how they actually behave. Measuring both perceptions and actual behaviors helps researchers understand the relationship between transmission lines and property values.

A recent literature review (Jackson and Pitts 2010, reference 1) examined 17 studies on the relationship between transmission lines and property values to compare their results and to develop some general conclusions. The 17 studies, spanning the time period between 1956 and 2009, were compiled and reviewed by Real Property Analytics, Inc., a private firm specializing in the valuation of property potentially affected by external environmental factors. The Real Property Analytics review was published in the Journal of Real Estate Literature, which is a publication of the American Real Estate Society. The studies evaluated impacts from transmission lines ranging from 69 kilovolts (kV) to 345 kV. They were placed into one of three categories designated by the authors:

- Survey-based studies;
- Statistical sales-based analyses using multivariate analysis to isolate the impact of transmission lines by holding other variables statistically constant; and
- Sales-based analyses not using multivariate analysis but utilizing factors such as sale/resale analysis, price per square foot comparisons, case studies, and "paired sales" analysis, where the values of two homes that are similar in all respects except for proximity to transmission lines are compared.

Upon completion of their review of the studies, Jackson and Pitts (2010, reference 1) concluded the following:

> *"The studies reviewed…generally pointed to small or no effects on sales prices due to the presence of electric transmission lines. Some studies found an effect but this effect generally dissipated with time and distance. The effects that were found ranged from approximately 2% to 9%. Most studies found no effect and in some cases a premium was observed."*

Jackson and Pitts discussed the utility of both survey-based and statistically-based methods, quoting one of the research papers to note that statistical analyses "reflect what buyers and sellers actually do, opposed to what potential buyers say they might do, under specified hypothetical circumstances" Selected findings from Jackson and Pitts's literature review are provided below, along with the year and type of study:

Survey-based studies

- Kinnard, 1967 – Questionnaires were sent to property owners intersected by or abutting transmission line right-of-way (ROW) in 17 Connecticut subdivisions. Over 85 percent indicated

they would purchase again in the same location. Kinnard concluded that property value is not significantly affected by proximity to transmission lines.

- Morgan et al., 1985 – A questionnaire asked participants to rank the risk from transmission lines, electric blankets, and 14 other common hazards. Electric blankets and transmission lines were ranked as presenting the least risk. Participants were then provided with information on electric and magnetic fields (EMF) and associated potential health effects. Subsequent questionnaire responses indicated a change in perception and an increased concern about the risk of EMF.
- Solum, 1985 – Presented a questionnaire to 180 agricultural, recreational, or residential property owners in northwest Wisconsin whose land was encumbered by transmission lines. All three types had some level of concern over the proximity of the lines but for varying reasons. Further interviews indicated that all but one of the properties sold at a market price comparable to non-encumbered properties and that none of the buyers had reduced their purchase offers due to the presence of the transmission line.
- Delaney and Timmons, 1992 – Survey results from 219 real estate appraisers found that 84 percent believed that transmission line proximity results in an average ten percent lower market value. Ten percent of respondents found no effect and six percent thought transmission lines increased property value due to larger lots for similar price.
- Kung and Seagle, 1992 – Sent a questionnaire to homeowners in Memphis and Shelby Counties, Tennessee. Half of the respondents considered the transmission line an eyesore; however, 72 percent of those who thought the lines were an eyesore also said the lines had no effect on the purchase price. Prices of homes adjacent to the transmission line are similar to prices of other homes in the same neighborhood.
- Priestly and Evans, 1996 – Conducted a survey of 445 homeowners living near transmission lines in the San Francisco area. Eighty-seven percent of the 267 respondents felt the transmission line was a negative element in their neighborhood.

Statistical Sales Price Analyses

- Brown, 1976 – Conducted regression analysis on sales of farmland in Saskatchewan, Canada, between 1965 and 1970 and found that the relationship of land value to the number of power line structures was not statistically significant and that the lines did not negatively affect property value. Brown also found that the structures can be an impediment to farming operations.
- Colwell and Foley, 1979 – Examined 200 property sales over a ten-year period in Decatur, Illinois, and found that sales prices increase as distance from a transmission line increases. Property values were approximately six percent lower within 50 to 200 feet of the transmission line, but there was no difference in property value beyond 200 feet.
- Colwell, 1990 – Followed up the study above and confirmed that the selling price of residential property increases as distance from the transmission line increases. The rate of increase slows with distance and eventually disappears.
- Rigdon, 1991 – Evaluated 46 properties sold in Marquette County, Michigan over a five-year period and found no statistically significant relationship between sales price and proximity to a transmission line easement.
- Hamilton and Schwann, 1995 – Reviewed previous literature and found that transmission lines can reduce adjacent property values, but that the reduction is generally less than five percent of property value and that the reduction diminishes at 600 feet.
- Des Rosiers, 1998 – Reviewed property values of 507 homes in the Montreal area and found an average drop in property value of 9.6 percent for homes immediately adjacent to the line. He also

found an average increase of up to 9.2 percent in value for homes one to two lots away from the transmission line and no effect beyond 500 feet.

- Wolverton and Bottemiller, 2003 and Cowger, Bottemiller, and Cahill, 1996 – Two studies, both conducted in Portland, Vancouver, and Seattle, the 2003 work repeating the 1996 study with more rigorous analytical methods. Both applied statistical methods to paired-sales analysis and found no price effect on residential property from proximity to transmission lines. The data also show no difference in appreciation rates between homes near a transmission line and homes further away.
- Chalmers and Voorvaart, 2009 – Studied residential properties sold in Connecticut and Massachusetts between 1999 and 2007 and found proximity to transmission lines to have an insignificant effect on sales prices.

Sales-based analyses

- Carll, 1956 – Compared property values and interviewed owners, buyers, and brokers along a transmission line in Los Angeles and found that residences adjoining the ROW had not sold at a discount and that lenders did not adjust loan amounts for lots adjacent to the ROW.
- Bigras, 1964 – Reviewed over 1,900 deeds of sale and mortgages in Quebec and found that prices for vacant land adjacent to transmission lines were generally higher than the average price of all transactions. Land adjacent to transmission lines was sold faster and was developed to a higher degree than land away from the lines.

Jackson and Pitts (2010) concluded from these studies that proximity to transmission lines results in little or no effect on property value. In studies where transmission lines were found to have impacts to property values, the decrease in values typically ranged from approximately two percent to ten percent. In some instances, increases in property value were found. The following additional studies and reviews generally reach a similar conclusion.

Another recent meta-analysis, Brinkley and Leach (2019) evaluated 54 studies spanning 40 years. Their research found that half of the literature and studies on the impact of power lines concluded no effect on property values, and the other half showed a loss in property values of 2 to 10%. While home value studies showed mostly no price impacts, with effects ranging from a 2 to 9% decrease in price, some homes experienced a price premium. Half of the studies showed negative impacts with the range of 3-6%. Significant effects are noticeable to properties closer than 60 meters with an average decrease in value from 0.2 to 27.3%. Ranges of value impact within energy types show a great deal of uncertainty and many under-researched caveats in planning for energy infrastructure. For example, the impact of overhead powerlines is mixed, with results prefaced by access to viewsheds. The distance of maximal impact for powerlines was 200 meters, with a range of average value change of a 10% increase (if including improved access to greenspace) to a 30% decrease.

Brinkley and Leach (2019 found that studies after 1979 showed a more consistent reduction between 5-10%. Though many studies assert that visual impacts are the greatest predictor of property prices, the influence of buried power lines has yet to be assessed and so is not included in this meta-analysis. Research suggests that diminution in price for properties near the power lines tends to disappear anywhere from five to fourteen years after construction. This could be because of vegetation growth that acts as a cover. No studies conducted property value assessments in relation to community perception or knowledge about the development or involvement in job creation.

Thomas and Welke (2017) performed an event study to examine the revealed price effect on residential properties from an upgrade to high-voltage transmission towers that were constructed on an existing ROW. The study looked at a period of two years where existing 220 kV towers that were not in use were upgraded to 500 kV towers, then three years later, they were removed, and the lines were buried. They found a significant loss in value from the upgrade for encumbered (8.3%) and abutting (4.9%) properties, and insignificant losses when the older towers were present, even for lots with an easement. Their conclusions are consistent with previous studies that found the price impact is initially large but diminishes over time. Thomas and Welke (2017) concluded that their results were consistent with other research findings:

- Over time, price impact is diminished.
- Price impact effects vanish beyond about 100 meters.
- The proximate sales results are largely driven by abutting lots.
- Encumbered sales are significantly negatively affected and abutting properties somewhat less so.

They further found no evidence that public information prior to the construction of the towers affected sales prices, even if the property abutted or was encumbered by the ROW. They did find that the burying of the 500 kV cables required disruption to immediately proximate homeowners, but presumably at a much lower level than towers. More research would need to be done on effects post burying of the lines.

Between 1978 and 1982, Jensen and Weber and the Jensen Management Company conducted three studies in west-central Minnesota. The studies in 1978 and 1982 are of particular interest since they consider effects to agricultural land. The 1978 study found that the landowners cited an inconvenience to the presence of the line but had not paid less for their land (Weber and Jensen 1978, reference 2). The 1982 study, however, found there was a broad range of effects from no effect to a 20 percent reduction, which depended on the amount of disruption to farm operations (Jensen and Weber 1982, reference 3).

The David Wyman and Chris Mothorpe's study, "The Pricing of Power Lines: A Geospatial Approach to Measuring Residential Property Values" (Reference 8), examines the relationship between high-voltage transmission lines and vacant property prices in Pickens County, South Carolina, using geospatial techniques. Analyzing 5,455 vacant lot sales in Pickens County, South Carolina, the study concluded that the proximity and visibility of these lines (based on geospatial analysis techniques) influence property values. Vacant lots adjacent to power lines experienced an average price discount of 44.9 percent, while those non-adjacent vacant properties up to 1,000 feet away saw a price discount of 17.9 percent. Visibility, particularly of transmission towers, amplifies this effect, with properties that had an unobstructed view resulting in greater devaluation. They state that their findings are site-specific to this study, and caution that pricing discounts for vacant properties in rural settings may not be generalizable to complex suburban settings or properties with residential housing structures. This study was also limited to a sample that excluded parcels larger than 20 acres in size.

James A. Chalmers' study, "High-Voltage Transmission Lines and Rural, Western Real Estate Values," (Reference 7) investigates the impact of 500 kV transmission lines on property values of agricultural, residential, and recreational uses throughout 640 miles of Montana between 2000 and 2010. The study was done using a combination of 49 transactions and an even larger number of lot sales in 7 subdivisions. The study utilized personal interviews, sales comparisons, and paired sales techniques. The research found that three issues were dominant: Use, size, and substitutes. If the property was more heavily oriented to residential use - it was more vulnerable to transmission line impacts, whereas property-oriented more toward purely recreational use were much less vulnerable to impacts. Properties that were oriented to agricultural use showed no price effects of transmission lines. The larger the

property, the less vulnerable it was to impacts. There can be price and absorption (that is – the time it takes a property to sell) effects if there are alternative properties similar to the subjected property. If the property affected is relatively unique and the transmission line is one of several differentiating factors, the property is less vulnerable to price and absorption effects. The study emphasized that the market response to high-voltage lines varies greatly depending on location, property-specific factors, and the visibility of the lines.

In the final EIS on the Arrowhead-Weston Electric Transmission Line Project, the Wisconsin Public Service Commission (PSC) addressed the issue of property value changes associated with high-voltage transmission lines. This document summarized the findings of approximately 30 papers, articles, and court cases covering the period from 1987 through 1999. The Arrowhead-Weston EIS provides six general observations (reference 4):

- The potential reduction in sale price for single-family homes may range from zero to 14 percent.
- Adverse effects on the sale price of smaller properties could be greater than effects on the sale price of larger properties.
- Other amenities, such as proximity to school or jobs, lot size, square footage of a house, and neighborhood characteristics, tend to have a much greater effect on sale price than the presence of a power line.
- The adverse effects appear to diminish over time.
- Effects on sale price are most often observed for properties crossed by or immediately adjacent to a power line, but effects have also been observed for properties farther away from the line.
- The value of agricultural property is likely to decrease if the power line poles are placed in an area that inhibits farm operations.

The Arrowhead-Weston Electric Transmission Line Project environmental impact statement (EIS) reported that in Midwest states such as Minnesota, Wisconsin, and the Upper Peninsula of Michigan, the average decrease appears to be between four and seven percent. The EIS noted that it is very difficult to make predictions about how a specific transmission line would affect the value of specific properties.

An additional potential adverse effect of transmission lines on adjacent properties is on the ability of homeowners and developers to obtain Federal Housing Administration (FHA) and/or Housing and Urban Development (HUD) loans. Section 2.2(J) of the current HUD guidebook 4150.2 addresses this issue in the following FAQ:

> *FAQ: Is a property eligible for FHA if there are overhead or high-voltage power lines nearby?*
>
> *The appraiser must indicate whether the dwelling or related property improvements are located within the easement serving a high-voltage transmission line, radio/TV transmission tower, cell phone tower, microwave relay dish or tower, or satellite dish (radio, TV cable, etc.).*
>
> *1) If the dwelling or related property improvement is located within such an easement, the lender must obtain a letter from the owner or operator of the tower indicating that the dwelling and its related property improvements are not located within the tower's (engineered) fall distance in order to waive this requirement.*
>
> *2) If the dwelling and related property improvements are located outside the easement, the property is considered eligible and no further action is necessary. The appraiser, however, is*

instructed to note and comment on the effect on marketability resulting from the proximity to such site hazards and nuisances.

In general, and for the safe operation of the line, a residence cannot be located within a transmission line ROW; thus, all residences near the project would fall into category 2 (a dwelling located “outside the easement”). For this category, the HUD appraiser is directed to comment on any effects on marketability resulting from the transmission line. These comments could affect loan values if an appraiser believes the residence is nevertheless located so near the transmission line that the line could be a hazard or nuisance.

References

1. Jackson and Pitts, 2010. The Effects of Transmission Lines on Property Values: A Literature Review. Journal of Real Estate Literature. Volume 18, No 2.

2. Weber, William V. and Glenn A. Jensen. 1978. A Study of High Voltage Power Line Easements and their Effect on Farm Land Values in West Central Minnesota. Luverne, Minnesota: Jensen Management Service.

3. Jensen, Glenn A. and William V. Weber. 1982. High Voltage Transmission Lines and their Effect on Farm Land Value in West Central Minnesota. Luverne, Minnesota: Jensen Management Service, Inc.

4. Final Environmental Impact Statement, Arrowhead –Weston Electric Transmission Line Project, Volume I, Public Service Commission of Wisconsin Docket 05-CE-113, October 2000, pg 212-215.

5. Brinkley, Catherine and Leach, Andrew. 2019. Energy Next Door: A Meta-Analysis of Energy Infrastructure Impact on Housing Value. Energy Research & Social Science. DOI: 10.1016/j.erss.2018.11.014

6. Thomas, Charles and Welke, Gerd. 2017. The Effect of HVTLs on Property Values: An Event Study. International Real Estate Review. Volume 20, No 2.

7. Chalmers, James A., 2012. High-Voltage Transmission Lines and Rural, Western Real Estate Values. The Appraisal Journal. Volume 80, No. 3.

8. Wyman, David, and Mothorpe, Chris, 2018. The Pricing of Power Lines: A Geospatial Approach to Measuring Residential Property Values. Journal of Real Estate Research. Volume 40, No. 3.

Appendix E

Draft Route Permit

EERA STAFF PROPOSED MODIFICATIONS TO THE COMMISSION'S SAMPLE PERMIT ARE SHOWN BY STRIKEOUTS AND UNDERSCORING IN RED

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

ROUTE PERMIT FOR THE
~~[PROJECT NAME]~~
FORKS-ROST 161 kV TRANSMISSION PROJECT

A HIGH-VOLTAGE TRANSMISSION LINE AND ASSOCIATED FACILITIES

IN
[JACKSON COUNTY]

ISSUED TO
~~[PERMITTEE]~~ ITC MIDWEST LLC

PUC DOCKET NO. [~~Docket Number~~ ET6675/TL-24-232]

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850 this route permit is hereby issued to:

~~[Permittee]~~ ITC MIDWEST LLC

ITC MIDWEST LLC [the "Permittee"] is authorized by this route permit to construct and operate a new 161 kV high voltage transmission line and associated facilities ~~[Provide a description of the project~~ authorized by the Minnesota Public Utilities Commission].

The high-voltage transmission line shall be constructed within the route identified in this route permit and in compliance with the conditions specified in this route permit.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

_____
Will Seuffert, Executive Secretary

To request this document in another format such as large print or audio, call 651-296-0406 or 800-657-3782 (voice). Persons with a hearing or speech impairment may call using their preferred Telecommunications Relay Service or email consumer.puc@state.mn.us for assistance.

CONTENTS

ATTACHMENTS

~~**SAMPLE PERMIT**~~ **DRAFT PERMIT** [~~Project Name~~ Beaver Creek Transmission Line Project and PUC Docket No. ET6675/TL-24-232]

1 ROUTE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this route permit to ~~[Permittee Name]~~ ITC Midwest LLC (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This route permit authorizes the Permittee to construct and operate a new 161 kV high voltage transmission line and associated facilities ~~[Provide a description of the project as authorized by the Commission] ([Project Name, if applicable]~~, henceforth known as Transmission Facility). The high-voltage transmission line shall be constructed within the route identified in this route permit and in compliance with the conditions specified in this route permit.

1.1 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this route permit shall be the sole route approval required for construction of the transmission facilities and this route permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose governments.

2 TRANSMISSION FACILITY DESCRIPTION

~~[Provide a description of the Transmission Facility as authorized by the Commission]~~

The transmission facility includes the construction and operation of approximately 8.5 miles of 161 kV transmission line and associated facilities between the existing Rost Substation in the northeast quarter of section 22 in Ewington Township and the new Forks Switching Station in the south half of section 26 in Rost Township in Jackson County, Minnesota, as identified in the attached route maps and described below.

The Transmission Facility is in the following:

County	Township Name	Township	Range	Section
Jackson	Ewington	102N	37W	22, 23, 24, 25, 26, 27, 35, 36
Jackson	Rost	102N	38W	26, 27, 28, 29, 30, 31, 32, 33, 34, 35

2.1 Structures

~~[Provide a detailed description of the structures authorized by the Commission]~~
The Forks-Rost transmission line project will consist of single circuit monopole steel structures spaced approximately 600 to 800 feet apart. Transmission structures will range in height from 80 to 120 feet above ground, depending upon the terrain and environmental constraints. The average diameter of the steel structures at ground level is 3 to 5 feet. Electrical conductors attached to structures will be oriented in a delta or vertical configuration. In the delta configuration there is one overhead ground wire at the top, two phases on one side and a single phase on the other) supported by suspension insulators at tangent structures and strain insulators at tension structures (i.e., dead-end structures). Dead-end structures will use a vertical conductor configuration. Any structure with a line angle of greater than two degrees will be supported on a drilled shaft concrete foundation. Foundation depths are dependent upon geotechnical data and final design.

2.2 Conductors

~~[Provide a detailed description of the conductors authorized by the Commission]~~
The single circuit structures will have three single conductor phase wires and one shield wire. It is anticipated that the phase wires will be "T2 Grosbeak" which consists of two aluminum conductor steel reinforced (ACSR) "Grosbeak" conductors in a twisted pair configuration or a conductor with similar electrical capacity and mechanical strength properties. The shield wire will be a 48-count optical ground wire.

The table below details specifics on the various structure and conductor types as presented in the route permit application.

Line Type	Conductor	Structure		Foundation	Height	Span
		Type	Material			
161 kV	Proposed phase wires are T2 Grosbeak aluminum conductor steel reinforced ACSS) "Grosbeak" or conductor with similar electrical capacity and mechanical strength	Monopole with davit arms and suspension insulators	Steel	Direct Embeded or Vibratory Caisson	80 to 120	600 to 800
161 kV		Monopole with strain insulator attachments directly to pole	Steel	Concrete Foundation	80 to 120	600 to 800

	properties. The shield wire will be a 48- count optical ground wire					

2.3 Substations and Associated Facilities

~~[Provide a detailed description of the associated facilities and substations as authorized by the Commission]~~

The Forks Switching Station, located in in the south half of section 26 in Rost Township, will be equipped with SF6 gas circuit breakers with current sensing transformers, voltage sensing and station service type transformers, and a control enclosure which will house required relaying equipment and a supervisory control and data acquisition (SCADA) equipment. The Forks Switching Station will initially have three 161 kV transmission lines connected to it and the Switching Station will initially have a ring bus configuration. In addition to the new Forks-Rost 161 kV line that will be constructed, the existing ITC Midwest Lakefield Junction-Dickinson County 161 kV line will be cut into the Forks Switching Station creating a Forks-Lakefield Junction and Dickinson County-Forks 161 kV lines.

3 DESIGNATED ROUTE

The route designated by the Commission is depicted on the route maps attached to this route permit (Designated Route). The Designated Route is generally described as follows:

~~[Provide detailed description of the authorized route including the route widths and any other specifics relevant to each segment. Also include a reference to the relevant route map to be attached to the route permit.]~~

The Forks-Rost 161 kV Transmission Line will begin at the new Rost Substation operated by Great River Energy, near the intersection of County Road 5 and 790th Street in Jackson County. The 161 kV transmission line will exit the substation and run south along County Road 5 to 780th Street for approximately 1 mile, where it will turn east and run for 1 mile to 360th Avenue. The transmission line will run south on 360th Avenue for 1 mile before turning east and continuing on 770th Street for approximately 5.5 miles, where it will then enter the new Forks Switching Station on the west.

The Designed Route includes an anticipated alignment and a right-of-way. The right-of-way is the physical land needed for the safe operation of the transmission line. The Permittee shall locate the alignment and associated right-of-way within the Designated Route unless otherwise

authorized by this route permit or the Commission. The Designated Route provides the Permittee with flexibility for minor adjustments of the alignment and right-of-way to accommodate landowner requests and unforeseen conditions.

Any modifications to the Designated Route or modifications that would result in right-of-way placement outside the Designated Route shall be specifically reviewed by the Commission in accordance with Minn. R. 7850.4900 and Section 10 of this route permit.

4 RIGHT-OF-WAY

This route permit authorizes the Permittee to obtain a new permanent right-of-way for the transmission line up to [~~number~~100] feet in width. The permanent right-of-way is typically [~~number~~50] feet on both sides of the transmission line measured from its centerline or alignment.

The anticipated alignment is intended to minimize potential impacts relative to the criteria identified in Minn. R. 7850.4100. The final alignment must generally conform to the anticipated alignment identified on the route maps unless changes are requested by individual landowners and agreed to by the Permittee or for unforeseen conditions that are encountered or as otherwise provided for by this route permit.

Any right-of-way or alignment modifications within the Designated Route shall be located so as to have comparable overall impacts relative to the factors in Minn. R. 7850.4100, as does the right-of-way and alignment identified in this route permit and shall be specifically identified and documented in and approved as part of the plan and profile submitted pursuant to Section 9.1 of this route permit.

Where the transmission line parallels existing highway and other road rights-of-way, the transmission line right-of-way shall occupy and utilize the existing right-of-way to the maximum extent possible; consistent with the criteria in Minn. R. 7850.4100, and the other requirements of this route permit; and for highways under the jurisdiction of the Minnesota Department of Transportation (MnDOT), the procedures for accommodating utilities in trunk highway rights-of-way.

5 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction and operation of the Transmission Facility over the life of this route permit.

5.1 Route Permit Distribution

Within 30 days of issuance of this route permit, the Permittee shall provide all affected landowners with a copy of this route permit and the complaint procedures. An affected landowner is any landowner or designee that is within or adjacent to the Designated Route. In no case shall a landowner receive this route permit and complaint procedures less than five days prior to the start of construction on their property. The Permittee shall also provide a copy of this route permit and the complaint procedures to the applicable regional development commissions, county environmental offices, and city and township clerks. The Permittee shall file with the Commission an affidavit of its route permit and complaint procedures distribution within 30 days of issuance of this route permit.

5.2 Access to Property

The Permittee shall notify landowners prior to entering or conducting maintenance within their property, unless otherwise negotiated with the landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of the Minnesota Department of Commerce (Department of Commerce) staff or Commission staff.

5.3 Construction and Operation Practices

The Permittee shall comply with the construction practices, operation and maintenance practices, and material specifications described in the permitting record for this Transmission Facility unless this route permit establishes a different requirement in which case this route permit shall prevail.

5.3.1 Field Representative

The Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this route permit during construction of the Transmission Facility. This person shall be accessible by telephone or other means during normal business hours throughout site preparation, construction, cleanup, and restoration.

The Permittee shall file with the Commission the name, address, email, phone number, and emergency phone number of the field representative at least 14 days prior to the pre-construction meeting. The Permittee shall provide the field representative's contact information to affected landowners, local government units and other interested persons at least 14 days prior to the pre-construction meeting. The Permittee may change the field representative at any time upon notice to the Commission, affected landowners, local government units and other interested persons. The Permittee shall file with the Commission

an affidavit of distribution of its field representative's contact information at least 14 days prior to the pre-construction meeting and upon changes to the field representative.

5.3.2 Employee Training - Route Permit Terms and Conditions

The Permittee shall train all employees, contractors, and other persons involved in the Transmission Facility construction regarding the terms and conditions of this route permit. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.3 Independent Third-Party Monitoring

Prior to any construction, the Permittee shall propose a scope of work and identify an independent third-party monitor to conduct construction monitoring on behalf of the Department of Commerce. The scope of work shall be developed in consultation with and approved by the Department of Commerce. This third-party monitor will report directly to and will be under the control of the Department of Commerce with costs borne by the Permittee. Department of Commerce staff shall keep records of compliance with this section and will ensure that status reports detailing the construction monitoring are filed with the Commission in accordance with scope of work approved by the Department of Commerce.

5.3.4 Public Services, Public Utilities, and Existing Easements

During Transmission Facility construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these shall be temporary, and the Permittee shall restore service promptly. Where any impacts to utilities have the potential to occur the Permittee shall work with both landowners and local entities to determine the most appropriate mitigation measures if not already considered as part of this route permit.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.5 Temporary Workspace

The Permittee shall limit temporary easements to special construction access needs and additional staging, or lay-down areas required outside of the authorized right-of-way. Temporary space shall be selected to limit the removal and impacts to vegetation. The Permittee shall obtain temporary easements outside of the authorized transmission line right-

of-way from affected landowners through rental agreements. Temporary easements are not provided for in this route permit.

The Permittee may construct temporary driveways between the roadway and the structures to minimize impact using the shortest route feasible. The Permittee shall use construction mats to minimize impacts on access paths and construction areas. The Permittee shall submit the location of temporary workspaces and driveways with the plan and profile pursuant to Section 9.1.

5.3.6 Noise

The Permittee shall comply with noise standards established under Minn. R. 7030.0010 to 7030.0080. The Permittee shall limit construction and maintenance activities to daytime working hours to the extent practicable.

5.3.7 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners or land management agencies prior to final location of structures, rights-of-way, and other areas with the potential for visual disturbance. The Permittee shall use care to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the Transmission Facility during construction and maintenance. The Permittee shall work with landowners to locate the high-voltage transmission line to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads. The Permittee shall place structures at a distance, consistent with sound engineering principles and system reliability criteria, from intersecting roads, highways, or trail crossings.

5.3.8 Soil Erosion and Sediment Control

The Permittee shall implement those erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency (MPCA) Construction Stormwater Program. If construction of the Transmission Facility disturbs more than one acre of land or is sited in an area designated by the MPCA as having potential for impacts to water resources, the Permittee shall obtain a National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit from the MPCA that provides for the development of a Stormwater Pollution Prevention Plan that describes methods to control erosion and runoff.

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling

vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the Transmission Facility shall be returned to pre-construction conditions.

5.3.9 Wetlands and Water Resources

The Permittee shall develop wetland impact avoidance measures and implement them during construction of the Transmission Facility. Measures shall include spacing and placing the power poles at variable distances to span and avoid wetlands, watercourses, and floodplains. Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, the Permittee shall construct in wetland areas during frozen ground conditions where practicable and according to permit requirements by the applicable permitting authority. When construction during winter is not possible, the Permittee shall use wooden or composite mats to protect wetland vegetation.

The Permittee shall contain soil excavated from the wetlands and riparian areas and not place it back into the wetland or riparian area. The Permittee shall access wetlands and riparian areas using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts. The Permittee shall not place staging or stringing set up areas within or adjacent to wetlands or water resources, as practicable. The Permittee shall assemble power pole structures on upland areas before they are brought to the site for installation.

The Permittee shall restore wetland and water resource areas disturbed by construction activities to pre-construction conditions in accordance with the requirements of applicable state and federal permits or laws and landowner agreements. The Permittee shall meet the USACE, Minnesota Department of Natural Resources (DNR), Minnesota Board of Water and Soil Resources, and local units of government wetland and water resource requirements.

5.3.10 Vegetation Management

The Permittee shall minimize the number of trees to be removed in selecting the right-of-way specifically preserving to the maximum extent practicable windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

The Permittee shall remove tall growing species located within the transmission line right-of-way that endanger the safe and reliable operation of the transmission line. The Permittee shall leave undisturbed, to the extent possible, existing low growing species in the right-of-way or replant such species in the right-of-way to blend the difference between the right-of-way and

adjacent areas, to the extent that the low growing vegetation that will not pose a threat to the transmission line or impede construction.

5.3.11 Application of Pesticides

The Permittee shall restrict pesticide use to those pesticides and methods of application approved by the Minnesota Department of Agriculture (MDA), DNR, and the U.S. Environmental Protection Agency (EPA). Selective foliage or basal application shall be used when practicable. All pesticides shall be applied in a safe and cautious manner so as not to damage adjacent properties including crops, orchards, tree farms, apiaries, or gardens. The Permittee shall contact the landowner at least 14 days prior to pesticide application on their property. The Permittee may not apply any pesticide if the landowner requests that there be no application of pesticides within the landowner's property. The Permittee shall provide notice of pesticide application to landowners and beekeepers operating known apiaries within three miles of the pesticide application area at least 14 days prior to such application. The Permittee shall keep pesticide communication and application records and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.12 Invasive Species

The Permittee shall employ best management practices to avoid the potential introduction and spread of invasive species on lands disturbed by Transmission Facility construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

5.3.13 Noxious Weeds

The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.14 Roads

The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city, or township roads that will be used during the construction phase of the Transmission Facility. Where practical, existing roadways shall be used for all activities associated with construction of the Transmission Facility. Oversize or overweight loads

associated with the Transmission Facility shall not be hauled across public roads without required permits and approvals.

The Permittee shall construct the fewest number of site access roads required. Access roads shall not be constructed across streams and drainage ways without the required permits and approvals. Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits.

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when accessing construction workspace, unless otherwise negotiated with the affected landowner.

5.3.15 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to archaeological and historic resources when constructing the Transmission Facility. In the event that a resource is encountered, the Permittee shall consult with the State Historic Preservation Office and the State Archaeologist. Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an effort to minimize Transmission Facility impacts on the resource consistent with State Historic Preservation Office and State Archaeologist requirements.

Prior to construction, the Permittee shall train workers about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If human remains are encountered during construction, the Permittee shall immediately halt construction and promptly notify local law enforcement and the State Archaeologist. The Permittee shall not resume construction at such location until authorized by local law enforcement or the State Archaeologist. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.16 Avian Protection

The Permittee in cooperation with the DNR shall identify areas of the transmission line where bird flight diverters will be incorporated into the transmission line design to prevent large avian collisions attributed to visibility issues. Standard transmission design shall incorporate adequate spacing of conductors and grounding devices in accordance with Avian Power Line Interaction Committee standards to eliminate the risk of electrocution to raptors with larger wingspans that may simultaneously come in contact with a conductor and grounding devices. The Permittee shall submit documentation of its avian protection coordination with the plan and profile pursuant to Section 9.1.

5.3.17 Drainage Tiles

The Permittee shall avoid, promptly repair, or replace all drainage tiles broken or damaged during all phases of the Transmission Facility's life unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.3.18 Restoration

The Permittee shall restore the right-of-way, temporary workspaces, access roads, abandoned right-of-way, and other public or private lands affected by construction of the Transmission Facility. Restoration within the right-of-way must be compatible with the safe operation, maintenance, and inspection of the transmission line. Within 60 days after completion of all restoration activities, the Permittee shall file with the Commission a Notice of Restoration Completion.

5.3.19 Cleanup

The Permittee shall remove and properly dispose of all construction waste and scrap from the right-of-way and all premises on which construction activities were conducted upon completion of each task. The Permittee shall remove and properly dispose of all personal litter, including bottles, cans, and paper from construction activities daily.

5.3.20 Pollution and Hazardous Wastes

The Permittee shall take all appropriate precautions to protect against pollution of the environment. The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean up and disposal of all waste generated during construction and restoration of the Transmission Facility.

5.3.21 Damages

The Permittee shall fairly restore or compensate landowners for damage to crops, fences, private roads and lanes, landscaping, drain tile, or other damages sustained during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.4 Electrical Performance Standards

5.4.1 Grounding

The Permittee shall design, construct, and operate the transmission line in a manner so that the maximum induced steady-state short-circuit current shall be limited to five milliamperes root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the right-of-way, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short-circuit current between ground and the object so as not to exceed one milliampere rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the National Electric Safety Code. The Permittee shall address and rectify any induced current problems that arise during transmission line operation.

5.4.2 Electric Field

The Permittee shall design, construct, and operate the transmission line in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

5.4.3 Interference with Communication Devices

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the Transmission Facility, the Permittee shall take whatever action is necessary to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the Transmission Facility. The Permittee shall keep records of compliance with this section and provide them upon the request of Department of Commerce staff or Commission staff.

5.5 Other Requirements

5.5.1 Safety Codes and Design Requirements

The Permittee shall design the transmission line and associated facilities to meet or exceed all relevant local and state codes, the National Electric Safety Code, and North American Electric Reliability Corporation requirements. This includes standards relating to clearances to ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements.

5.5.2 Other Permits and Regulations

The Permittee shall comply with all applicable state statutes and rules. The Permittee shall obtain all required permits for the Transmission Facility and comply with the conditions of those permits unless those permits conflict with or are preempted by federal or state permits and regulations.

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission an Other Permits and Regulations Submittal that contains a detailed status of all permits, authorizations, and approvals that have been applied for specific to the Transmission Facility. The Other Permits and Regulations Submittal shall also include the permitting agency name; the name of the permit, authorization, or approval being sought; contact person and contact information for the permitting agency or authority; brief description of why the permit, authorization, or approval is needed; application submittal date; and the date the permit, authorization, or approval was issued or is anticipated to be issued.

The Permittee shall demonstrate that it has obtained all necessary permits, authorizations, and approvals by filing an affidavit stating as such and an updated Other Permits and Regulations Submittal prior to commencing construction. The Permittee shall provide a copy of any such permits, authorizations, and approvals at the request of Department of Commerce staff or Commission staff.

6 SPECIAL CONDITIONS

The special conditions shall take precedence over other conditions of this permit should there be a conflict.

~~[Add Special Conditions in accordance with the record of the docket]~~

6.1 Calcareous Fen

Should any calcareous fens be identified within the project area, the Permittees must work with DNR to determine if any impacts will occur during any phase of the Project. If the Project is anticipated to impact any calcareous fens, the Permittees must develop a Calcareous Fen Management Plan in coordination with the DNR, as specified in Minn. Stat. § 103G.223. Should a Calcareous Fen Management Plan be required, the approved plan must be submitted concurrently with the plan and profile required in Section 9.2 of the Permit.

6.2 Facility Lighting

For all new lighting installations at Project substations and facilities associated with substations, the Permittees shall utilize downlit and shielded lighting to reduce harm to birds, insects, and other animals. Lighting utilized shall minimize blue hue. The Permittees shall keep records of

compliance with this section and provide them upon the request of Commission staff.

6.3 Dust Control

To protect plants and wildlife from chloride products that do not break down in the environment, the Permittees are prohibited from using dust control products containing calcium chloride or magnesium chloride during construction and operation of the Project. The Permittees shall keep records of compliance with this section and provide them upon the request of Commission staff.

6.4 Wildlife-Friendly Erosion Control

The Permittee shall use only "bio-netting" or "natural netting" types of erosion control materials and mulch products without synthetic (plastic) fiber additives.

7 DELAY IN CONSTRUCTION

If the Permittee has not commenced construction or improvement of the route within four years after the date of issuance of this route permit the Permittee shall file a Failure to Construct Report and the Commission shall consider suspension of this route permit in accordance with Minn. R. 7850.4700.

8 COMPLAINT PROCEDURES

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission the complaint procedures that will be used to receive and respond to complaints. The complaint procedures shall be in accordance with the requirements of Minn. R. 7829.1500 or Minn. R. 7829.1700, and as set forth in the complaint procedures attached to this route permit.

Upon request, the Permittee shall assist Department of Commerce staff or Commission staff with the disposition of unresolved or longstanding complaints. This assistance shall include, but is not limited to, the submittal of complaint correspondence and complaint resolution efforts.

9 COMPLIANCE REQUIREMENTS

Failure to timely and properly make compliance filings required by this route permit is a failure to comply with the conditions of this route permit. Compliance filings must be electronically filed with the Commission.

9.1 Pre-Construction Meeting

Prior to the start of construction, the Permittee shall participate in a pre-construction meeting with Department of Commerce and Commission staff to review pre-construction filing requirements, scheduling, and to coordinate monitoring of construction and site restoration activities. Within 14 days following the pre-construction meeting, the Permittee shall file with the Commission a summary of the topics reviewed and discussed and a list of attendees. The Permittee shall indicate in the filing the anticipated construction start date.

9.2 Plan and Profile

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission, and provide the Department of Commerce, and the counties where the Transmission Facility, or portion of the Transmission Facility, will be constructed with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, structure specifications and locations, cleanup, and restoration for the Transmission Facility. The documentation shall include maps depicting the plan and profile including the right-of-way, alignment, and structures in relation to the route and alignment approved per this route permit.

The Permittee may not commence construction until the earlier of (i) 30 days after the pre-construction meeting or (ii) or until the Commission staff has notified the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this route permit.

If the Commission notifies the Permittee in writing within 30 days after the pre-construction meeting that it has completed its review of the documents and planned construction, and finds that the planned construction is not consistent with this route permit, the Permittee may submit additional and/or revised documentation and may not commence construction until the Commission has notified the Permittee in writing that it has determined that the planned construction is consistent with this route permit.

If the Permittee intends to make any significant changes in its plan and profile or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission, the Department of Commerce, and county staff at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this route permit.

9.3 Status Reports

The Permittee shall file with the Commission monthly Construction Status Reports beginning with the pre-construction meeting and until completion of restoration. Construction Status Reports shall describe construction activities and progress, activities undertaken in compliance with this route permit, and shall include text and photographs.

If the Permittee does not commence construction of the Transmission Facility within six months of this route permit issuance, the Permittee shall file with the Commission Pre-Construction Status Reports on the anticipated timing of construction every six months beginning with the issuance of this route permit until the pre-construction meeting.

9.4 In-Service Date

At least three days before the Transmission Facility is to be placed into service, the Permittee shall notify the Commission of the date on which the Transmission Facility will be placed into service and the date on which construction was completed.

9.5 As-Builts

Within 90 days after completion of construction, the Permittee shall submit to the Commission copies of all final as-built plans and specifications developed during the Transmission Facility construction.

9.6 GPS Data

Within 90 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (*e.g.*, ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the Transmission Facility and each substation connected.

9.7 Right of Entry

The Permittee shall allow Commission designated representatives to perform the following, upon reasonable notice, upon presentation of credentials and at all times in compliance with the Permittee's site safety standards:

(a) To enter upon the facilities easement of the property for the purpose of obtaining information, examining records, and conducting surveys or investigations.
(b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations.
(c) To sample and monitor upon the facilities easement of the property.

To examine and copy any documents pertaining to compliance with the conditions of this route permit.

10 ROUTE PERMIT AMENDMENT

This route permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this route permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required under Minn. R. 7850.4900.

11 TRANSFER OF ROUTE PERMIT

The Permittee may request at any time that the Commission transfer this route permit to another person or entity (transferee). In its request, the Permittee must provide the Commission with:

(a) the name and description of the transferee;
(b) the reasons for the transfer;
(c) a description of the facilities affected; and
(d) the proposed effective date of the transfer.

The transferee must provide the Commission with a certification that it has read, understands and is able to comply with the plans and procedures filed for the Transmission Facility and all conditions of this route permit. The Commission may authorize transfer of the route permit after affording the Permittee, the transferee, and interested persons such process as is required under Minn. R. 7850.5000.

12 REVOCATION OR SUSPENSION OF ROUTE PERMIT

The Commission may initiate action to revoke or suspend this route permit at any time. The Commission shall act in accordance with the requirements of Minn. R. 7850.5100, to revoke or suspend this route permit.

Appendix F

EMF Supplement

Appendix F Electric and Magnetic Fields Supplement

There is concern about the potential for adverse health effects from exposure to electric and magnetic Fields (EMF) as the result of residing near high voltage transmission lines (HVTLs). Extremely low-frequency (ELF) - EMF that is emitted from HVTLs does not have the energy to ionize molecules or to heat them; however, they are fields of energy and thus have the potential to produce effects.

In the 1970s, epidemiological studies indicated a possible association between childhood leukemia and EMF levels. Since then, various types of research, including animal studies, epidemiological studies, clinical studies and cellular studies, have been conducted to examine the potential health effects of EMF. Scientific panels and commissions have reviewed and studied this research data. These studies have been conducted by, among others, the National Institute of Environmental Health Sciences (NIEHS), the World Health Organization (WHO), the International Agency for Research on Cancer (IARC), the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) and the Minnesota State Interagency Working Group (MSIWG). In general, these studies concur that:

- Based on epidemiological studies, there is a weak association between childhood leukemia and EMF exposure. There is however no consistent association between EMF exposure and other diseases in children or adults.

- Laboratory, animal, and cellular studies fail to show a cause and effect relationship between disease and EMF exposure at common EMF levels. A biological mechanism for how EMFs might cause disease has not been established.

Because a cause and effect relationship cannot be established, yet a weak association between childhood leukemia and EMF exposure has been shown: 1) the potential health effects of EMF are uncertain; 2) no methodology for estimating health effects based on EMF exposure exists; 3) further study of the potential health effects of EMF is needed; and 4) a precautionary approach, including regulations and guidelines, is needed in designing and using all electrical devices.

Researchers continue to study potential health effects related to ELF-EMF and potential causal mechanisms. The following sections provide brief summaries from scientific panels and commissions that have examined the potential health impacts of ELF-EMF.

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID program). Congress instructed NIEHS and the U.S. Department of Energy to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risk from exposure to ELF-EMF. The program provided the following conclusions to Congress (NIEHS 1999, reference F1):

- “The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak.

- Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent positive findings in animal or mechanistic studies weakens the belief that this

association (the epidemiological association between ELF-EMF and childhood leukemia) is actually due to ELF-EMFs but it cannot completely discount the epidemiological findings.

- The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on education both the public and regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer outcomes provide sufficient evidence of a risk to currently warrant concern."

In 2002, the EMF-RAPID program published a detailed question and answer pamphlet summarizing research on ELF-EMF and potential health effects. The pamphlet is available at: http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

World Health Organization

In 1996, the WHO established the International EMF Project to study the potential health impacts of EMF. The project develops and disseminates information on EMF and public health. In 2007, the WHO issued an environmental health monograph on ELF-EMF (WHO 2007, reference F2). The monograph concluded:

- "Scientific evidence suggesting that everyday, chronic low-intensity (above 0.3 – 0.4 μT) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. Uncertainties in the hazard assessment include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern.

- A number of other diseases have been investigated for the possible association with ELF magnetic field exposures. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.

- The use of precautionary approaches is warranted. However, electric power brings obvious health, social and economic benefits and precautionary approaches should not compromise these benefits. Furthermore, given both weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia and the limited impacted on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. The costs of implementing exposure reductions would vary from one country to another, making it very difficult to provide general recommendation for balancing the costs against the potential risk from ELF fields."

International Agency for Research on Cancer

Since 1969, the IARC has been evaluating the carcinogenic risks of chemicals and other agents, such as viruses and radiation. In 2001, the IARC convened a working group of scientists to evaluate possible carcinogenic risks to humans from exposure to EMF (IARC 2002, reference F3). These scientists concluded that ELF magnetic fields are possibly carcinogenic to humans (a "Group 2B carcinogen"). Group 2B carcinogens are agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals. The working group concluded:

- "Since the first report suggesting an association between residential ELF electric and magnetic fields and childhood leukemia was published in 1979, dozens of increasingly sophisticated studies have examined this association. In addition, there have been numerous comprehensive review, meta-analyses and two recent pooled analyses. In one pooled analysis…no excess risk was seen for exposure to ELF magnetic fields below 0.4 μT and a twofold excess risk was seen for exposure above 0.4 μT. [In the other study] a relative risk of 1.7 for exposure above 0.3 μT was reported.

- No consistent relationship has been seen in studies of childhood brain tumors or cancers at other sites and residential ELF electric and magnetic fields.

- While a number of studies are available, reliable data on adult cancer and residential exposure to ELF electric and magnetic fields, including the use of appliances, are sparse and methodologically limited…. Although there have been considerable number of reports, a consistent association between residential exposure and adult leukemia and brain cancer has not been established."

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)

The SCENIHR serves as an advisory committee to the European Commission. At the request of the Commission, the SCENIHR reviewed possible adverse health impacts due to EMF. In 2007, the committee concluded (SCENIHR 2007, reference F4):

- "The previous conclusion (by a prior advisory committee, the Scientific Committee on Toxicity, Ecotoxicity and the Environment, CSTEE) that ELF magnetic fields are possibly carcinogenic, chiefly based on occurrence of childhood leukemia, is still valid. For breast cancer and cardiovascular disease, recent research has indicated that an association is unlikely. For neurodegenerative diseases and brain tumors, the link to ELF fields remains uncertain."

- In vitro studies have documented that that low intensity ELF can inhibit the anti-proliferative effect of tamoxifen on a specific subclone of human MCF-7 breast cancer cells (Blackman et al. 2001, reference F5; Ishido et al. 2001, reference F6; Girgert et al. 2005, reference F7). There is a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

In 2009, the committee updated its prior opinion after reviewing new studies of ELF-EMF (SCENIHR 2009, reference F8) and concluded:

- "The new information available is not sufficient to changes the conclusions of the 2007 opinion. The few new epidemiological and animal studies that have addressed ELF exposure and cancer do not change the previous assessment that ELF magnetic fields are a possible carcinogen and might contribute to an increase in childhood leukemia. At present, in vitro studies did not provide a mechanistic explanation of this epidemiological finding.

- New epidemiological studies indicate a possible increase in Alzheimer's disease arising from exposure to ELF. Further epidemiological and laboratory investigations of this observation are needed."

- There remains a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

Minnesota State Interagency Working Group (MSIWG)

In 2002, the MSIWG on EMF issues was formed to examine the potential health impacts of EMF and to provide science-based information to policy makers in Minnesota. Working group members included representatives from the Department of Commerce, Department of Health, Pollution Control Agency, Public Utilities Commission, and Environmental Quality Board. The working group issued a white paper entitled "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options" (MSIWG on EMF Issues 2002, reference F9). The white paper concluded:

- "Some epidemiological results do show a weak but consistent association between childhood leukemia and increasing exposure to EMF... However, epidemiological studies alone are considered insufficient for concluding that a cause and effect relationship exists and the association must be supported by data from laboratory studies. Existing laboratory studies have not substantiated this relationship… nor have scientists been able to understand the biological mechanism of how EMF could cause adverse effects. In addition, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMF.

- The Minnesota Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk from EMF cannot be dismissed. Construction of new generation and transmission facilities to meet increasing electrical needs in the state is likely to increase exposure to EMF and public concern regarding potential adverse health effects.

- Based on its review, the Work Group believes the most appropriate public health policy is to take a prudent avoidance approach to regulating EMF. Based upon this approach, policy recommendations of the Work Group include:

    - Apply low-cost EMF mitigation options in electric infrastructure construction projects;

    - Encourage conservation;

    - Encourage distributed generation;

    - Continue to monitor EMF research;

- Encourage utilities to work with customers on household EMF issues; and
- Provide public education on EMF issues."

References

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F6. Ishido, M., Nitta, H., & Kabuto, M. (2001). Magnetic fields (MF) of 50 Hz at 1.2 µT as well as 100 µT cause uncoupling of inhibitory pathways of adenylyl cyclase mediated by melatonin 1a receptor in MF-sensitive MCF-7 cells. Carcinogenesis, 22(7), pp. 1043-1048.

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F9. The Minnesota State Interagency Working Group on EMF Issues, 2002. A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options. Accessed November 2018 at: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7B474587DD-E5C5-4A6E-95BC-7BC805CE4975%7D&documentTitle=20101-45731-07

Appendix G

GHG Calculations

ITC Midwest LLC.
Forks-Rost Transmission Line Project
GHG Calculations

Table 1. Summary of Construction GHG Emissions

Emission Source	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e (metric tons)
Direct Sources				
Mobile Combustion	6,045.85	8.20E-01	4.96E-01	6,200.30
Temporary Land Use Change	-	-	-	47.69
TOTAL - ALL SOURCES	**6,045.85**	**0.82**	**0.50**	**6,247.99**

Table 2. Summary of Operations GHG Emissions

Emission Source	CO_2 (metric tons/year)	CH_4 (metric tons/year)	N_2O (metric tons/year)	CO_2e (metric tons/year)
Direct Sources				
Mobile Combustion	1.83	2.32E-04	1.32E-04	1.88
Permanent Land Use Change	-	-	-	2.67
TOTAL - ALL SOURCES	**1.83**	**2.32E-04**	**1.32E-04**	**4.55**

Table 3. Conversions

Unit	Amount	Unit
1 US ton	2000	lbs
1 US ton	0.907185	metric tons
1 US ton	907.185	kg
1 US ton	907185	grams
1 metric ton	1000	kg
1kg	1000	grams
1 lb	0.453592	kg
1 lb	453.592	grams
1 MWh	1000	kWh
1 hectare	2.47105	acres
1 MJ	0.372506136	hp-h
US gallon (diesel)[1]	144.945	MJ
US gallon (diesel)	53.9929019	hp-h
US gallon (gasoline)[1]	126.833	MJ
US gallon (gasoline)	47.24606261	hp-h

[1] US Energy Information Administration, 2024. https://www.eia.gov/energyexplained/units-and-calculators/energy-conversion-calculators.php

Table 4. Global Warming Potentials

Greenhouse Gas Name	CAS Number	Chemical Formula	Global Warming Potential (100-yr.) [1]
Carbon dioxide	124–38–9	CO_2	1
Methane	74–82–8	CH_4	28
Nitrous oxide	10024–97–2	N_2O	265

[1] Global Warming Potentials, 100-Year Time Horizon, Table A-1 to Subpart A of Part 98, Title 40

Table 5. Construction Emissions from Fuel Combustion Sources

Equipment Type[1]	Fuel Type[1]	Number of Units[1]	Annual Operating Time per Unit[1] (hours)	Estimated Horsepower [1]	CO_2 Emission Factor[2] (kg/gal)	CH_4 Emission Factor[3] (g/gal)	N_2O Emission Factor[3] (g/gal)	CO_2 Emission Factor[2] (lb/hr)	CH_4 Emission Factor[3] (lb/hr)	N_2O Emission Factor[3] (lb/hr)	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e[4] (metric tons)
Backhoe	Diesel Fuel	2	1116	75	10.21	1.01	0.94	31.27	3.09E-03	2.88E-03	31.66	3.13E-03	2.91E-03	32.52
Bulldozer	Diesel Fuel	2	744	250	10.21	1.01	0.94	104.22	1.03E-02	9.60E-03	70.34	6.96E-03	6.48E-03	72.26
Concrete Mixer Truck	Diesel Fuel	8	384	325	10.21	1.01	0.94	135.49	1.34E-02	1.25E-02	188.80	1.87E-02	1.74E-02	193.93
Dump Truck	Diesel Fuel	3	1674	300	10.21	0.92	0.56	125.07	1.13E-02	6.86E-03	284.90	2.57E-02	1.56E-02	289.76
Excavator	Diesel Fuel	1	372	325	10.21	1.01	0.94	135.49	1.34E-02	1.25E-02	22.86	2.26E-03	2.10E-03	23.48
Pickup Truck	Motor Gasoline	5	9300	150	8.78	2.86	1.48	53.78	1.75E-02	9.06E-03	1,134.23	3.69E-01	1.91E-01	1,195.24
Skid steer loader	Diesel Fuel	3	2790	50	10.21	1.01	0.94	20.84	2.06E-03	1.92E-03	79.14	7.83E-03	7.29E-03	81.29
Large Crane	Diesel Fuel	1	744	15	10.21	1.01	0.94	6.25	6.19E-04	5.76E-04	2.11	2.09E-04	1.94E-04	2.17
Medium Crane	Diesel Fuel	2	2976	450	10.21	1.01	0.94	187.60	1.86E-02	1.73E-02	506.48	5.01E-02	4.66E-02	520.24
Hydrovac Truck	Diesel Fuel	1	930	200	10.21	0.92	0.56	83.38	7.51E-03	4.57E-03	35.17	3.17E-03	1.93E-03	35.77
Semitruck/Trailer	Diesel Fuel	1	360	500	10.21	0.92	0.56	208.45	1.88E-02	1.14E-02	34.04	3.07E-03	1.87E-03	34.62
Bucket Truck	Diesel Fuel	4	5952	400	10.21	0.92	0.56	166.76	1.50E-02	9.15E-03	1,800.83	1.62E-01	9.88E-02	1,831.55
Digger Truck	Diesel Fuel	4	5952	400	10.21	0.92	0.56	166.76	1.50E-02	9.15E-03	1,800.83	1.62E-01	9.88E-02	1,831.55
Loader	Diesel Fuel	1	960	300	10.21	1.01	0.94	125.07	1.24E-02	1.15E-02	54.46	5.39E-03	5.01E-03	55.94
TOTAL	--	--	--	--	--	--	--	--	--	--	**6,045.85**	**8.20E-01**	**4.96E-01**	**6,200.30**

[1] Based on information provided by ITC Midwest LLC on 03/13/2025.

[2] CO_2 emissions calculated using the EPA CCCL emission factors for mobile combustion, Table 2: Mobile Combustion CO_2, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Fuel Type	CO_2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78

[3] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Vehicle Type	Fuel Type	CH4 Emission Factor (g/gal)	N2O Emission Factor (g/gal)
Construction/Mining Equipment	Diesel Equipment	1.01	0.94
Construction/Mining Equipment	Diesel Off-road Trucks	0.92	0.56
Construction/Mining Equipment	Gasoline Off-Road Trucks	2.86	1.48

[4] CO2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions.

Table 6. Construction Land Use Change GHG Emissions

Temporary Land Use Change[1]	Area of Land Change[1] (acres)	2022 Net CO_2 Flux for Converted Land Type[2][3] (M metric tons CO_2e)	2022 Total US Land Use Change to Settlement[4] (thousands of hectares)	CO_2e Emission Factor (metric tons CO_2e/acre)	CO_2e[5] (metric tons)
Cropland to Settlement	55.50	2.9	1,228	0.96	39.78
Grassland to Settlement	0.37	7.5	1,648	1.84	0.51
Wetland to Settlement	1.19	0.1	14	2.89	2.58
Settlement remaining Settlement	45.01	15.4	43,748	0.14	4.81
TOTAL	**102.07**	**-**	**-**	**-**	**47.69**

[1] Estimated from development area delineation files and NLCD land cover estimates. Assuming project "Right-of-Way" as the construction development area.

[2] Table 6-136: Net CO2 Flux from Soil, Dead Organic Matter and Biomass Carbon Stock Changes for Land Converted to Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[3] Table 6-119: Net CO2 Flux from Soil C Stock Changes in Settlements Remaining Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.

[4] Table 6-5: Land Use and Land-Use Change for the U.S. Managed Land Base for All 50 States, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[5] Emissions are calculated for an assumed 9-month duration of temporary disturbances as per the route permit application construction timeline; April 2026 to December 2026.

Table 7. Operation Emissions from Fuel Combustion Sources

Activity	Activity Frequency[1]	Equipment Type[1]	Fuel Type[1]	Number of Units[1]	Operating Time[1] (hours/yr)	Estimated Horsepower[1]	CO_2 Emission Factor[2] (kg/gal)	CH_4 Emission Factor[3] (g/gal)	N_2O Emission Factor[3] (g/gal)	CO_2 Emission Factor[4] (lb/hr)	CH_4 Emission Factor[4] (lb/hr)	N_2O Emission Factor[4] (lb/hr)	CO_2 (metric tons/yr)	CH_4 (metric tons/yr)	N_2O (metric tons/yr)	CO_2e[5] (metric tons/yr)
Vegetation Management	Annual	Bucket Truck	Diesel Fuel	1	16	400	10.21	0.92	0.56	190.57	1.72E-02	1.05E-02	1.38	1.25E-04	7.59E-05	1.41
Vegetation Management	Annual	Chipper	Motor Gasoline	1	16	72	8.78	3.02	1.50	25.81	8.88E-03	4.41E-03	0.19	6.44E-05	3.20E-05	0.20
Vegetation Management	Annual	Skid steer mower	Diesel Fuel	1	8	110	10.21	0.67	0.49	45.86	3.01E-03	2.20E-03	0.17	1.09E-05	7.99E-06	0.17
Inspection	Annual	Pickup Truck	Motor Gasoline	1	4	150	8.78	2.86	1.48	53.78	1.75E-02	9.06E-03	0.10	3.18E-05	1.64E-05	0.10
TOTAL		--		--	--	--				--	--		**1.83**	**2.32E-04**	**1.32E-04**	**1.88**

[1] Activity, frequency, equipment type, number of units, estimated horsepower, and operating time provided electronically by ITC Midwest LLC. on 03/13/2025 and 03/26/2025.

[2] CO_2 emissions calculated using the EPA CCCL emission factors for mobile combustion, Table 2: Mobile Combustion CO_2, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Fuel Type	CO2 Emission Factor (kg/gal)
Diesel Fuel	10.21
Motor Gasoline	8.78

[3] CH_4 and N_2O emissions calculated using the EPA CCCL emission factors for construction/mining equipment, Table 5: Mobile Combustion CH_4 and N_2O for Non-Road Vehicles, 2025. https://www.epa.gov/system/files/documents/2025-01/ghg-emission-factors-hub-2025.pdf

Vehicle Type	Fuel Type	CH4 Emission Factor	N2O Emission Factor
Lawn and Garden Equipment	Diesel	0.67	0.49
Lawn and Garden Equipment	Gasoline (4 stroke)	3.02	1.50
Agricultural Equipment	Diesel Off-Road Trucks	0.92	0.56
Construction/Mining Equipment	Gasoline Off-Road	2.86	1.48

[4] Emission factors converted to lb/hr using conversion rates of 53.993 hp-hr/gal for diesel, and 47.246 hp-hr/gal for gasoline.

[5] CO_2e calculated by equation A-1 of 40 CFR 98.2, which states the total CO_2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions.

Table 8. Operation Land Use Change GHG Emissions

Temporary Land Use Change[1]	Area of Land Change[1] (acres)	2022 Net CO_2 Flux for Converted Land Type[2][3] (M metric tons CO_2e)	2022 Total US Land Use Change to Settlement[4] (thousands of hectares)	CO_2e Emission Factor (metric tons CO_2e/acre)	CO_2e[5] (metric tons)
Cropland to Settlement	11.76	2.9	1,228	0.96	2.67
Settlement remaining Settlement	0.08	15.4	43,748	0.14	2.69E-03
TOTAL	**11.84**	**-**	**-**	**-**	**2.67**

[1] Estimated from development area delineation files and NLCD land cover estimates. Assuming project "Right-of-Way" as the construction development area.

[2] Table 6-136: Net CO2 Flux from Soil, Dead Organic Matter and Biomass Carbon Stock Changes
for Land Converted to Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[3] Table 6-119: Net CO2 Flux from Soil C Stock Changes in Settlements Remaining Settlements, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.

[4] Table 6-5: Land Use and Land-Use Change for the U.S. Managed Land Base for All 50 States, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 - 2022. https://www.epa.gov/system/files/documents/2024-04/us-ghg-inventory-2024-main-text_04-18-2024.pdf

[5] The switching station will be located within an 11.8-acre area, with final expected dimensions of 375 feet by 325 feet (2.8-acre) per the route permit application.

Appendix H

Agricultural Impact Mitigation Plan

FORKS 161 kV SWITCHING STATION AND FORKS-ROST 161 kV TRANSMISSION LINE PROJECT

ITC Midwest LLC

Agricultural Impact Mitigation Plan

Docket Number

ET6675/TL-24-232

Prepared by:

merjent

September 2024

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DEFINITIONS

Agricultural Land	Land that is actively managed for cropland, hayland, or pasture, and land in government set-aside programs.
Certifying Agent	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Cropland	Land actively managed for growing row crops, small grains, or hay.
Decertified or Decertification	Loss of Organic Certification.
Easement	The agreement(s) and/or interest in privately owned Agricultural Land held by ITC Midwest by virtue of which it has the right to construct, operate and maintain the transmission line together with such other rights and obligations as may be set forth in such agreement.
Final Clean-up	Transmission line activity that occurs after the power line has been constructed. Final Clean-up activities may include: removal of construction debris, de-compaction of soil as required, installation of permanent erosion control structures, final grading, and restoration of fences and required reseeding. Once Final Clean-up is finished, Landowner will be contacted to settle all damage issues and will be provided a form to sign acknowledging final construction settlement.
Inspector	Full-time on-site inspector retained by ITC Midwest to verify compliance with requirements of this AIMP during construction of the transmission line. The Inspector will have demonstrated experience with transmission line construction on Agricultural Land.
ITC Midwest	ITC Midwest LLC, a Michigan limited liability company. May also include agents and contractors of ITC Midwest, where appropriate.
Landowner	Person(s), or their representatives, holding legal title to Agricultural Land on the transmission line route from whom ITC Midwest is seeking, or has obtained, a temporary or permanent Easement. “Landowner” includes Tenant, if any.
Non-Agricultural Land	Any land that is not “Agricultural Land” as defined above.
Prohibited Substance	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.600 through 7 CFR 205.605 using the criteria provided in 7 USC 6517 and 7 USC 6518.
Project	Proposed 161 kilovolt transmission line from new Forks Switching Station to new Rost Substation in Jackson County, Minnesota
Proposed Route	“Route” means the location of a high voltage transmission line between two end points. The route may have a variable width of up to 1.25 miles. (Minnesota Statute 216E.01)
Right-of-Way	The Agricultural Land included in permanent and temporary Easements which ITC Midwest acquires for the purpose of constructing, operating and maintaining the transmission line. Also “ROW.”
Subsoil	Soil that is not Topsoil and located immediately below Topsoil.

Tenant	Any person(s) lawfully renting or sharing land for agricultural production which makes up the “Right-of-Way” as defined in this AIMP.
Tile	Artificial subsurface drainage system.
Topsoil	The uppermost horizon (layer) of the soil, typically with the darkest color and highest content of organic matter.

1.0 INTRODUCTION

ITC Midwest LLC (ITC Midwest) developed this Agricultural Impact Mitigation Plan (AIMP) with the Minnesota Department of Agriculture (MDA) in compliance with Minnesota Statutes Section 216E.10, subdivision 3(b). The AIMP identifies measures ITC Midwest will take during construction of its Forks 161 kilovolt (kV) Switching Station and Forks-Rost 161 kV Transmission Line Project (Project) to avoid, minimize, mitigate, repair, or provide compensation for impacts on Agricultural Land.

The Project will include the construction of the new Forks Switching Station southwest of the City of Lakefield, Minnesota, and a new approximately 8.5 mile long 161 kV high voltage transmission line from the new Forks Switching Station to the new Rost Substation to be permitted separately and constructed by Great River Energy, east of the City of Worthington, Minnesota. The AIMP and its provisions will be implemented during construction and restoration activities that ITC Midwest undertakes for the Project prior to filing notice of completion of construction with the Minnesota Public Utilities Commission (Commission).

ITC Midwest has asked the Commission to approve a Proposed Route with a width of 1,500 feet (750 feet on either side of the proposed transmission centerline). At a minimum, the Project will have a Right-of-Way (ROW) that is 100 feet wide (typically 50 feet on each side of the transmission centerline).

Capitalized words and other defined terms have the meanings given to them in this AIMP. Use of “Landowner” in this AIMP may be construed to read “Landowner and/or Tenant.”

This AIMP and its construction standards and policies apply only to construction activities occurring on privately-owned Agricultural Land. If agricultural drain Tiles are encountered, whether on Non-Agricultural Land or Agricultural Land, ITC Midwest will implement construction standards relating to the repair of Tile on Agricultural Lands discussed further in this AIMP.

No organic farms have been identified along or adjacent to the Proposed Route. If that changes prior to construction of the Project, portions of this AIMP will be updated to identify standards and policies as they apply to Organic Agricultural Land, and those portions of the AIMP will apply only to the types of lands defined in the National Organic Program Rules (7 C.F.R. Parts 205.100; 205.101, and 205.202).

Construction standards and policies identified in this AIMP can be modified through terms in an easement or other agreement between ITC Midwest and the Landowner, as appropriate. In such cases, the Easement or other agreement will control.

2.0 GENERALLY

ITC Midwest will negotiate in good faith with each Landowner to secure an agreement containing the conditions or provisions necessary to implement the provisions of this AIMP. The mitigative actions set forth in this AIMP are subject to negotiation and approval or change by Landowner so long as such changes are negotiated with and acceptable to ITC Midwest. Mitigative actions will be executed by qualified contractors retained by ITC Midwest, unless otherwise specified or agreed upon by the Landowner. ITC Midwest and the Landowner may agree that certain activities will be performed by Landowner. ITC Midwest maintains a damage claim policy outlining

compensation policies for damage to property, including but not limited to crop damages, and will provide a copy of this policy to the Landowner during Easement acquisition negotiations.

Unless otherwise specified in this AIMP or in an easement or other agreement negotiated between ITC Midwest and Landowner, construction standards and policies or mitigative actions will be implemented within 90 days after completion of Final Clean-up activities on Agricultural Land. Weather conditions or other circumstances identified by mutual agreement between Landowner and ITC Midwest may delay implementation of mitigative actions after Final Clean-up. Where practicable, ITC Midwest may make temporary repairs. These temporary repairs may be made to minimize additional property damage or interference with the Landowner's access to the subject Agricultural Land.

ITC Midwest or its contractors will implement the construction standards and policies or mitigative actions identified within this AIMP so long as such activities do not conflict with any applicable Federal or State rules, regulations, permits, licenses, approvals, or conditions obtained by ITC Midwest for the Project. Should any activity within this AIMP be determined to be unenforceable due to Federal or State rules, regulations, permits, licenses, approvals, or conditions, ITC Midwest will inform the Landowner and will identify a reasonable alternative activity.

Prior to ROW preparation for, or construction of, the Project, ITC Midwest will make a good faith effort to provide each Landowner with contact information, including a phone number and address, that can be used to contact ITC Midwest regarding any impacts to Agricultural Land or other construction-related concerns or questions. ITC Midwest will provide updated information to the Landowner within a reasonable time of any change to ITC Midwest contacts.

3.0 CONSTRUCTION STANDARDS

3.1 MITIGATIVE ACTIONS

ITC Midwest will reasonably restore and/or compensate the Landowner, as appropriate, for damages caused by ITC Midwest as a result of Project construction, and as outlined in this plan. ITC Midwest will decide whether to restore land and/or compensate the Landowner after a discussion with the Landowner.

3.2 ADVANCE NOTICE OF ACCESS

ITC Midwest will make good faith efforts to provide notice to the Landowner in advance of the commencement of construction activities on Agricultural Land. Notice may include personal contact, email, letter, or telephone contact.

3.3 ITC MIDWEST AGRICULTURAL INSPECTOR

ITC Midwest's Agricultural Inspector will:

1. Be a full-time member of ITC Midwest's inspection team.

2. Be responsible for verifying ITC Midwest's compliance with the provisions of this AIMP during construction.

3. Work collaboratively with other members of ITC Midwest's construction team and land agents in achieving compliance with this AIMP.

4. Observe construction activities on Agricultural Land on a regular basis.

5. Have the authority to stop construction activities that are determined to be out of compliance with the provisions of this AIMP.

6. Document instances of noncompliance and work with construction personnel to identify and implement appropriate corrective actions as needed.

7. Provide construction personnel with training on provisions of this AIMP before construction begins.

8. Provide construction personnel with field training on specific topics as needed.

3.4 POLE PLACEMENT AND TEMPORARY ACCESS ROUTES

During the design of the Project, ITC Midwest's engineering, land, and permitting staff will seek input from Landowner, as practicable, to identify pole placement locations and to address issues that arise regarding poles. Prior to construction, the land agents will review the staked pole locations with the Landowner when requested to do so by the Landowner.

ITC Midwest will discuss the location of temporary access routes to be used for construction purposes with the Landowner.

A. Temporary access routes will be designed so as to not impede proper drainage and will be built to mitigate soil erosion on or near the temporary access routes.

B. After Final Clean-up, temporary access routes may be left intact through mutual agreement of the Landowner and ITC Midwest unless otherwise restricted by Federal, State, or local regulations.

C. If a temporary access route is to be removed, the Agricultural Land upon which the temporary access route is constructed will be returned to its previous use and restored to reasonably equivalent condition as existed prior to construction.

3.5 SWITCHING STATION CONSTRUCTION

The Project will require construction of the new Forks Switching Station. During construction, ITC Midwest will segregate Topsoil that must be removed for groundwork. At ITC Midwest's sole discretion, excess Topsoil may be made available to a Landowner who wishes to use this Topsoil on their property in an upland location. If the Topsoil is made available to a Landowner in other areas of the Project, it will be provided "as is" and the Landowner, not ITC Midwest, will be responsible for verifying that the quality of the Topsoil meets the Landowner's farming requirements. The Landowner is solely responsible for obtaining any required local, state, or federal permits or permissions that may be necessary for the placement of Topsoil on his or her property.

3.6 AGRICULTURAL TILE

ITC Midwest will contact an affected Landowner for their knowledge of Tile locations prior to installation of the transmission line. ITC Midwest will attempt to identify Tile if the Landowner does not know if Tile is located at the proposed pole location. Tile that is damaged, cut, or removed as a result of ITC Midwest's location efforts will be promptly repaired. The repair will be reported to the Inspector.

If Tile is damaged by Project construction, the Tile will be repaired with materials of the same quality as that which was damaged. If Tiles on or adjacent to the transmission line construction area are adversely affected by construction, ITC Midwest will take such actions as are necessary to restore the Tile function, including the relocation, reconfiguration, and replacement of the existing Tile. ITC Midwest will correct Tile repairs, as needed, after completion of the transmission line construction, provided the repairs were made by ITC Midwest or their agents or designees.

The affected Landowner may elect to negotiate a fair settlement with ITC Midwest for the Landowner to undertake the responsibility for repair, relocation, reconfiguration, or replacement of damaged Tile. In the event the Landowner chooses to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged Tile, ITC Midwest will have no further liability for the identified damaged Tile.

The following standards and policies apply to the Tile repairs completed by ITC Midwest:

1. Tiles will be repaired with materials of the same or reasonably comparable quality as that which were damaged.

2. If water is flowing through a damaged Tile, temporary repairs will be promptly installed and maintained until such time that permanent repairs can be made.

3. Before completing permanent Tile repairs in an area where a Landowner or ITC Midwest has identified a potential concern arising from Project construction, Tiles will be examined within the work area to check for Tile that might have been damaged by construction equipment. If Tiles are found to be damaged, they will be repaired so they operate as well after construction as before construction began.

4. ITC Midwest will make efforts to complete permanent Tile repairs within a reasonable timeframe after Final Clean-up, taking into account weather and soil conditions.

5. Following completion of Final Clean-up and damage settlement, ITC Midwest will be responsible for correcting and repairing Tile breaks, or other damages to Tile systems that are discovered on the Right-of-Way to the extent that such breaks are the result of Project construction. These damages are usually discovered after the first significant rain event. ITC Midwest will provide the Landowner with contact information should Tile damage issues be identified after Final Clean-up. ITC Midwest will not be responsible for Tile repairs performed by the Landowner.

ITC Midwest will be responsible for installing additional Tile or other drainage measures, including adding Topsoil, as necessary to properly drain wet areas along the Right-of-Way (ROW) caused by the construction of the Project.

3.7 TOPSOIL SEGREGATION

In order to protect and preserve the Topsoil during Project construction, ITC Midwest will separate the Topsoil from the other subsoil materials when all earthmoving activities, excavation, or trenching are taking place. There may be limited situations where excavated subsoil will be temporarily stored on adjacent, undisturbed Topsoil. In these situations, subsoil will be returned to the excavation with as little disturbance of the underlying Topsoil as practicable. During the excavation backfill process, the subsoil will be backfilled into the excavations first and compacted as necessary, followed by Topsoil replaced to the approximate locations from which it was removed.

3.8 SOIL COMPACTION/RUTTING

Compaction will be alleviated as practicable on cropland traversed by construction equipment. ITC Midwest will work with the Landowner to alleviate compaction during suitable weather conditions in a mutually agreeable manner.

ITC Midwest will repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by electric line construction. If, by mutual agreement, the Landowner repairs such damage, ITC Midwest will reimburse the Landowner for the reasonable cost of labor and the use of equipment to repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by electric line construction. ITC Midwest will make such payments within a reasonable period of time following final clean up and after receiving a statement substantiating the Landowner’s repair costs.

After Final Clean-up, ITC Midwest will pay for the reasonable cost of repairs to the Landowner's equipment if the equipment is damaged during repair of compaction, ruts, erosion, and/or washing of soil by materials or debris ITC Midwest left on the ROW during construction.

3.9 EXCESS SOIL AND ROCKS

Excess soil and rock will be removed from the site unless otherwise requested by the Landowner. After Final Clean-up and restoration of Agricultural Lands, ITC Midwest will make good faith efforts to obtain written acknowledgement of completion of such activities from the Landowner.

3.10 CONSTRUCTION DEBRIS

ITC Midwest will remove construction-related debris and material that is not an integral part of the transmission line from the Landowner's property at ITC Midwest's cost. Such material may include excess construction materials or litter generated by the construction crews.

3.11 PROCEDURES FOR DETERMINATION OF DAMAGES AND COMPENSATION

ITC Midwest will maintain a procedure for processing Landowner claims for construction-related damages, including but not limited to crop damages. The procedure is intended to standardize and minimize Landowner concerns regarding the recovery of damages, to provide a degree of

certainty and predictability for Landowner and ITC Midwest, and to foster good relationships among ITC Midwest and Landowner over the long term. A copy of the procedure will be provided to Landowner during easement acquisition negotiations.

Damage claim negotiations between ITC Midwest and any affected Landowner will be voluntary in nature. ITC Midwest will offer to compensate Landowners according to the terms of ITC Midwest's damage claim policy in effect at the time the easement is executed and recorded. The compensation offered is only an offer to settle, and the offer shall not be introduced in any proceeding brought by the Landowner to establish the amount of damages ITC Midwest must pay.

3.12 NOXIOUS WEED CONTROL

When requested, ITC Midwest will work with neighboring Landowners to determine adequate noxious weed control measures on lands owned by ITC Midwest for the Forks Switching Station. The intent of such noxious weed control measures is to prevent the spread of noxious weeds onto adjacent Agricultural Land. Any noxious weed control spraying will be in accordance with State of Minnesota regulations.

3.13 SOIL CONSERVATION PRACTICES

Soil conservation practices such as terraces and grassed waterways that are damaged by the transmission line's construction will be restored to their pre-construction condition as near as possible. ITC Midwest will attempt to work with the Landowner to identify and document the pre-construction conditions of these features.

3.14 IRRIGATION

The Proposed Route does not intersect an operational spray irrigation system. If an irrigation system is installed across or adjacent to the Proposed Route prior to Project construction, ITC Midwest will work with the Landowner to establish an acceptable amount of time the irrigation system may be out of service.

Appendix I

USFWS IPaC Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
Phone: (952) 858-0793

In Reply Refer To: 03/18/2025 01:16:12 UTC
Project Code: 2025-0070247
Project Name: Forks-Rost EA

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

This response has been generated by the Information, Planning, and Conservation (IPaC) system to provide information on natural resources that could be affected by your project. The U.S. Fish and Wildlife Service (Service) provides this response under the authority of the Endangered Species Act of 1973 (16 U.S.C. 1531-1543), the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d), the Migratory Bird Treaty Act (16 U.S.C. 703-712), and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

Threatened and Endangered Species
The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and may be affected by your proposed project. The species list fulfills the requirement for obtaining a Technical Assistance Letter from the U.S. Fish and Wildlife Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

Consultation Technical Assistance
Please refer to refer to our Section 7 website for guidance and technical assistance, including step-by-step instructions for making effects determinations for each species that might be present and for specific guidance on the following types of projects: projects in developed areas, HUD, CDBG, EDA, USDA Rural Development projects, pipelines, buried utilities, telecommunications, and requests for a Conditional Letter of Map Revision (CLOMR) from FEMA.

We recommend running the project (if it qualifies) through our **Minnesota-Wisconsin Federal Endangered Species Determination Key (Minnesota-Wisconsin ("D-key"))**. A demonstration video showing how-to access and use the determination key is available. Please note that the Minnesota-Wisconsin D-key is the third option of 3 available d-keys. D-keys are tools to help Federal agencies and other project proponents determine if their proposed action has the potential to adversely affect federally listed species and designated critical habitat. The Minnesota-Wisconsin D-key includes a structured set of questions that assists a project proponent in determining whether a proposed project qualifies for a certain predetermined consultation outcome for all federally listed species found in Minnesota and Wisconsin (except for the northern long-eared bat- see below), which includes determinations of “no effect” or “may affect, not likely to adversely affect." In each case, the Service has compiled and analyzed the best available information on the species’ biology and the impacts of certain activities to support these determinations.

If your completed d-key output letter shows a "No Effect" (NE) determination for all listed species, print your IPaC output letter for your files to document your compliance with the Endangered Species Act.

For Federal projects with a “Not Likely to Adversely Affect” (NLAA) determination, our concurrence becomes valid if you do not hear otherwise from us after a 30-day review period, as indicated in your letter.

If your d-key output letter indicates additional coordination with the Minnesota-Wisconsin Ecological Services Field Office is necessary (i.e., you get a “May Affect” determination), you will be provided additional guidance on contacting the Service to continue ESA coordination outside of the key; ESA compliance cannot be concluded using the key for “May Affect” determinations unless otherwise indicated in your output letter.

Note: Once you obtain your official species list, you are not required to continue in IPaC with d-keys, although in most cases these tools should expedite your review. If you choose to make an effects determination on your own, you may do so. If the project is a Federal Action, you may want to review our section 7 step-by-step instructions before making your determinations.

Using the IPaC Official Species List to Make No Effect and May Affect Determinations for Listed Species

1. If IPaC returns a result of “There are no listed species found within the vicinity of the project,” then project proponents can conclude the proposed activities will have **no effect** on any federally listed species under Service jurisdiction. Concurrence from the Service is not required for **no effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.
2. If IPaC returns one or more federally listed, proposed, or candidate species as potentially present in the action area of the proposed project – other than bats (see below) – then project proponents must determine if proposed activities will have **no effect** on or **may affect** those species. For assistance in determining if suitable habitat for listed, candidate, or proposed species occurs within your project area or if species may be affected by project activities, you can obtain Life History Information for Listed and Candidate Species on our office website. If no impacts will occur to a species on the IPaC species list (e.g., there is no habitat present in the project area), the appropriate determination is **no effect**. No further consultation or coordination is required. Attach this letter to the dated IPaC species list report for your records.

3. Should you determine that project activities **may affect** any federally listed, please contact our office for further coordination. Letters with requests for consultation or correspondence about your project should include the Consultation Tracking Number in the header. Electronic submission is preferred.

Northern Long-Eared Bats
Northern long-eared bats occur throughout Minnesota and Wisconsin and the information below may help in determining if your project may affect these species.

Suitable summer habitat for northern long-eared bats consists of a wide variety of forested/wooded habitats where they roost, forage, and travel and may also include some adjacent and interspersed non-forested habitats such as emergent wetlands and adjacent edges of agricultural fields, old fields and pastures. This includes forests and woodlots containing potential roosts (i.e., live trees and/or snags ≥3 inches dbh for northern long-eared bat that have exfoliating bark, cracks, crevices, and/or hollows), as well as linear features such as fencerows, riparian forests, and other wooded corridors. These wooded areas may be dense or loose aggregates of trees with variable amounts of canopy closure. Individual trees may be considered suitable habitat when they exhibit the characteristics of a potential roost tree and are located within 1,000 feet (305 meters) of forested/wooded habitat. Northern long-eared bats have also been observed roosting in human-made structures, such as buildings, barns, bridges, and bat houses; therefore, these structures should also be considered potential summer habitat and evaluated for use by bats. If your project will impact caves or mines or will involve clearing forest or woodland habitat containing suitable roosting habitat, northern long-eared bats could be affected. For bat activity dates, please review Appendix L in the Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines.

Examples of unsuitable habitat include:
- Individual trees that are greater than 1,000 feet from forested or wooded areas,
- Trees found in highly developed urban areas (e.g., street trees, downtown areas),
- A pure stand of less than 3-inch dbh trees that are not mixed with larger trees, and
- A monoculture stand of shrubby vegetation with no potential roost trees.

If IPaC returns a result that northern long-eared bats are potentially present in the action area of the proposed project, project proponents can conclude the proposed activities **may affect** this species **IF** one or more of the following activities are proposed:
- Clearing or disturbing suitable roosting habitat, as defined above, at any time of year,
- Any activity in or near the entrance to a cave or mine,
- Mining, deep excavation, or underground work within 0.25 miles of a cave or mine,
- Construction of one or more wind turbines, or
- Demolition or reconstruction of human-made structures that are known to be used by bats based on observations of roosting bats, bats emerging at dusk, or guano deposits or stains.

If none of the above activities are proposed, project proponents can conclude the proposed activities will have **no effect** on the northern long-eared bat. Concurrence from the Service is not required for **No Effect** determinations. No further consultation or coordination is required. Attach this letter to the dated IPaC

species list report for your records.

If any of the above activities are proposed, and the northern long-eared bat appears on the user's species list, the federal project user will be directed to either the northern long-eared bat and tricolored bat range-wide D-key or the Federal Highways Administration, Federal Railways Administration, and Federal Transit Administration Indiana bat/Northern long-eared bat D-key, depending on the type of project and federal agency involvement. Similar to the Minnesota-Wisconsin D-key, these d-keys helps to determine if prohibited take might occur and, if not, will generate an automated verification letter. Additional information about available tools can be found on the Service's northern long-eared bat website.

Whooping Crane
Whooping crane is designated as a non-essential experimental population in Wisconsin and consultation under Section 7(a)(2) of the Endangered Species Act is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, then you are not required to consult. For additional information on this designation and consultation requirements, please review "Establishment of a Nonessential Experimental Population of Whooping Cranes in the Eastern United States."

Other Trust Resources and Activities
Bald and Golden Eagles - Although the bald eagle has been removed from the endangered species list, this species and the golden eagle are protected by the Bald and Golden Eagle Act and the Migratory Bird Treaty Act. It is the responsibility of the project proponent to survey the area for any migratory bird nests. If there is an eagle nest on-site while work is on-going, eagles may be disturbed. We recommend avoiding and minimizing disturbance to eagles whenever practicable. If you cannot avoid eagle disturbance, you may seek a permit. A nest take permit is always required for removal, relocation, or obstruction of an eagle nest. For communication and wind energy projects, please refer to additional guidelines below.

Migratory Birds - The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Service. The Service has the responsibility under the MBTA to proactively prevent the mortality of migratory birds whenever possible and we encourage implementation of recommendations that minimize potential impacts to migratory birds. Such measures include clearing forested habitat outside the nesting season (generally March 1 to August 31) or conducting nest surveys prior to clearing to avoid injury to eggs or nestlings.

Communication Towers - Construction of new communications towers (including radio, television, cellular, and microwave) creates a potentially significant impact on migratory birds, especially some 350 species of night-migrating birds. However, the Service has developed voluntary guidelines for minimizing impacts.

Transmission Lines - Migratory birds, especially large species with long wingspans, heavy bodies, and poor maneuverability can also collide with power lines. In addition, mortality can occur when birds, particularly hawks, eagles, kites, falcons, and owls, attempt to perch on uninsulated or unguarded power poles. To minimize these risks, please refer to guidelines developed by the Avian Power Line Interaction Committee and the Service. Implementation of these measures is especially important along sections of lines adjacent to wetlands or other areas that support large numbers of raptors and migratory birds.

Wind Energy - To minimize impacts to migratory birds and bats, wind energy projects should follow the Service's Wind Energy Guidelines. In addition, please refer to the Service's Eagle Conservation Plan Guidance, which provides guidance for conserving bald and golden eagles in the course of siting, constructing, and operating wind energy facilities.

State Department of Natural Resources Coordination
While it is not required for your Federal section 7 consultation, please note that additional state endangered or threatened species may also have the potential to be impacted. **Please contact the Minnesota or Wisconsin Department of Natural Resources for information on state listed species that may be present in your proposed project area.**

Minnesota
Minnesota Department of Natural Resources - Endangered Resources Review Homepage
Email: Review.NHIS@state.mn.us

Wisconsin
Wisconsin Department of Natural Resources - Endangered Resources Review Homepage
Email: DNRERReview@wi.gov

We appreciate your concern for threatened and endangered species. Please feel free to contact our office with questions or for additional information.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Minnesota-Wisconsin Ecological Services Field Office
3815 American Blvd East
Bloomington, MN 55425-1659
(952) 858-0793

PROJECT SUMMARY

Project Code: 2025-0070247
Project Name: Forks-Rost EA
Project Type: Distribution Line - New Construction - Above Ground
Project Description: Construction of a 161 kilovolt (kV) transmission line.
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@43.615133650000004,-95.3552643744611,14z

Counties: Jackson County, Minnesota

ENDANGERED SPECIES ACT SPECIES

There is a total of 6 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Northern Long-eared Bat *Myotis septentrionalis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9045	Endangered
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened
Suckley's Cuckoo Bumble Bee *Bombus suckleyi* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10885	Proposed Endangered

FLOWERING PLANTS

NAME	STATUS
Prairie Bush-clover *Lespedeza leptostachya* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4458	Threatened
Western Prairie Fringed Orchid *Platanthera praeclara* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1669	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act [2] and the Migratory Bird Treaty Act (MBTA) [1]. Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate avoidance and minimization measures, as described in the various links on this page.

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1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Bald and Golden Eagles are protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). Any person or organization who plans or conducts activities that may result in impacts to Bald or Golden Eagles, or their nests, should follow appropriate regulations and implement required avoidance and minimization measures, as described in the various links on this page.

The data in this location indicates that no eagles have been observed in this area. This does not mean eagles are not present in your project area, especially if the area is difficult to survey. Please review the 'Steps to Take When No Results Are Returned' section of the Supplemental Information on Migratory Birds and Eagles document to determine if your project is in a poorly surveyed area. If it is, you may need to rely on other resources to determine if eagles may be present (e.g. your local FWS field office, state surveys, your own surveys).

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats, should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

MIGRATORY BIRDS

The Migratory Bird Treaty Act (MBTA) [1] prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the

Department of Interior U.S. Fish and Wildlife Service (Service). The incidental take of migratory birds is the injury or death of birds that results from, but is not the purpose, of an activity. The Service interprets the MBTA to prohibit incidental take.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the "Probability of Presence Summary" below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bobolink *Dolichonyx oryzivorus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Franklin's Gull *Leucophaeus pipixcan* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10567	Breeds May 1 to Jul 31
Lesser Yellowlegs *Tringa flavipes* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Northern Harrier *Circus hudsonius* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8350	Breeds Apr 1 to Sep 15
Pectoral Sandpiper *Calidris melanotos* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

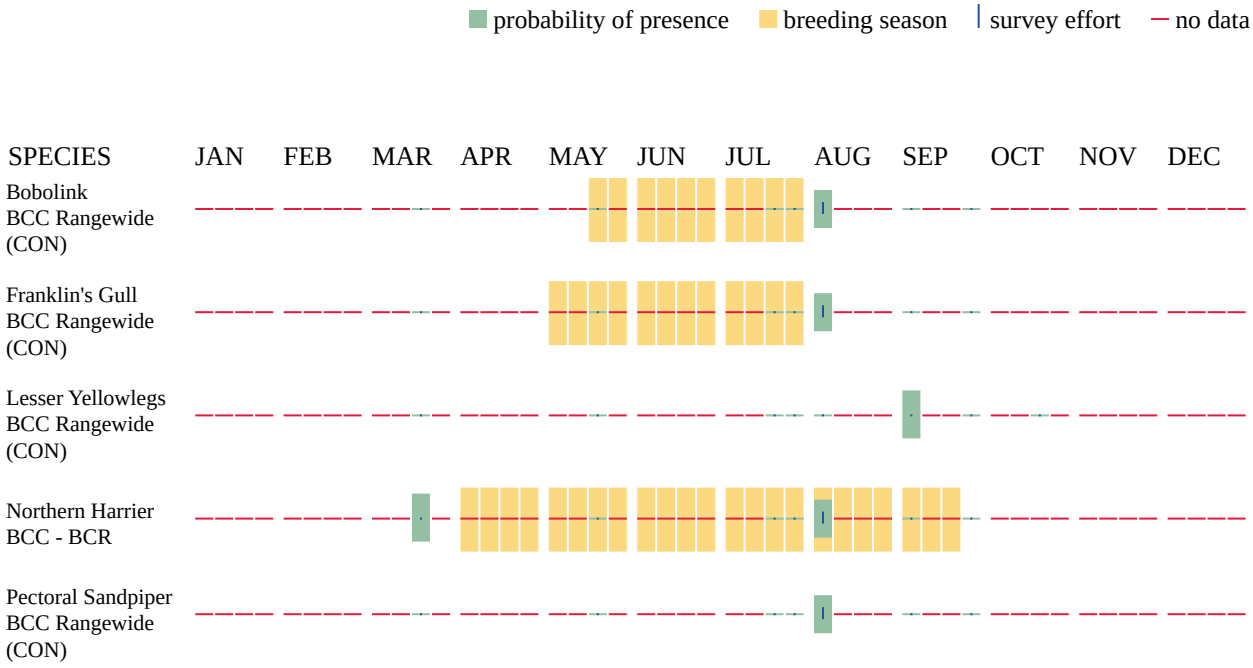
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide avoidance and minimization measures for birds
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

RIVERINE

- R5UBFx
- R4SBC
- R2UBH

FRESHWATER EMERGENT WETLAND

- PEM1A

IPAC USER CONTACT INFORMATION

Agency: Private Entity
Name: Alison McClear
Address: 3005 Boardwalk Drive, Suite100
City: Ann Arbor
State: MI
Zip: 48108
Email amcclear@barr.com
Phone: 7349224474

CERTIFICATE OF SERVICE

I, Sharon Ferguson, hereby certify that I have this day, served copies of the following document on the attached list of persons by electronic filing, certified mail, e-mail, or by depositing a true and correct copy thereof properly enveloped with postage paid in the United States Mail at St. Paul, Minnesota.

Minnesota Department of Commerce
Environmental Assessment

Docket No. ET6675/TL-24-232

Dated this **30th** day of **April 2025**

/s/Sharon Ferguson

#	First Name	Last Name	Email	Organization	Agency	Address	Delivery Method	Alternate Delivery Method	View Trade Secret	Service List Name
1	Katherine	Arnold	katherine.arnold@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
2	Generic	Commerce Attorneys	commerce.attorneys@ag.state.mn.us		Office of the Attorney General - Department of Commerce	445 Minnesota Street Suite 1400 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
3	Bret	Eknes	bret.eknes@state.mn.us		Public Utilities Commission	Suite 350 121 7th Place East St. Paul MN, 55101-2147 United States	Electronic Service		No	24-232Official CC Service List
4	Sharon	Ferguson	sharon.ferguson@state.mn.us		Department of Commerce	85 7th Place E Ste 280 Saint Paul MN, 55101-2198 United States	Electronic Service		No	24-232Official CC Service List
5	Valerie	Herring	vherring@taftlaw.com	Taft Stettinius & Hollister LLP		2200 IDS Center 80 S. Eighth Street Minneapolis MN, 55402 United States	Electronic Service		No	24-232Official CC Service List
6	Raymond	Kirsch	raymond.kirsch@state.mn.us		Department of Commerce	85 7th Place E Ste 500 St. Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
7	James	Mortenson	james.mortenson@state.mn.us		Office of Administrative Hearings	PO BOX 64620 St. Paul MN, 55164-0620 United States	Electronic Service		Yes	24-232Official CC Service List
8	Generic Notice	Residential Utilities Division	residential.utilities@ag.state.mn.us		Office of the Attorney General - Residential Utilities Division	1400 BRM Tower 445 Minnesota St St. Paul MN, 55101-2131 United States	Electronic Service		No	24-232Official CC Service List
9	Mark	Rothfork	mrothfork@itctransco.com	ITC Midwest LLC		100 East Grand Ave, Suite 360 Des Moines IA, 50309 United States	Electronic Service		No	24-232Official CC Service List
10	Will	Seuffert	will.seuffert@state.mn.us		Public Utilities Commission	121 7th Pl E Ste 350 Saint Paul MN, 55101 United States	Electronic Service		No	24-232Official CC Service List
11	Janet	Shaddix Elling	jshaddix@janetshaddix.com	Shaddix & Associates		7400 Lyndale Avenue South Suite 190 Richfield MN, 55423 United States	Electronic Service		Yes	24-232Official CC Service List