Environmental Assessment
Pilot Knob to Burnsville 115 kV Rebuild and Upgrade Project

The Human and Environmental Impacts of
Constructing and Operating the Pilot Knob to Burnsville 115 kV Rebuild and Upgrade Project

PUC Docket No. ET2/ TL-23-410
August 2024

COMMERCE DEPARTMENT

Project Contacts

Responsible Government Unit

Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

Commission Representative

Trevor Culbertson
(651) 201-2203
trevor.culbertson@state.mn.us

Preparer

Minnesota Department of Commerce
85 Seventh Place East, Suite 200
Saint Paul, MN 55101-2198

Commerce Representative

Erika Wilder
(651) 539-1009
erika.wilder@state.mn.us

Project Applicant

Great River Energy
12300 Elm Creek Boulevard
Maple Grove, MN 55369-5000

Project Representative

Mark Strohfus
(763) 445-5210
MStrohfus@GREnergy.com

Sources

Much of the information used to prepare this environmental assessment comes from the route permit application. Additional sources include additional information provided by Great River Energy, information from relevant environmental review documents for similar projects, site visits, and publicly available data.

Project Mailing List

To place your name on the project mailing list contact docketing.puc@state.mn.us or 651-201-2254 and provide the docket number (23-410), your name, email address, and mailing address. Please indicate how you would like to receive notices—by email or US mail.

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Abstract

Under the Power Plant Siting Act, a route permit from the Minnesota Public Utilities Commission (Commission) is required to construct a high voltage transmission line (HVTL). Great River Energy (Applicant or GRE) filed an application with the Commission for a route permit to rebuild and upgrade approximately 9 miles of an existing 69 kilovolt (kV) transmission line to 115 kV to ensure that GRE can maintain system reliability, prepare for future load growth, and preserve existing loops serving the Deerwood and River Hills substations. GRE is a not-for-profit wholesale electric power cooperative providing electricity and related services to approximately 1.7 million people through its 27 member-owner cooperatives and customers. This includes Dakota Electric Association, the distribution cooperative serving the area in which the project would be located.

GRE submitted a route permit application on November 17, 2023. The application was filed pursuant to the alternative review process defined in Minnesota Statute 216E.04 and Minnesota Rules 7850.2800–3900. On January 17, 2024, the Commission issued an order accepting the route permit application as substantially complete.

Department of Commerce (Commerce), staff is responsible for conducting environmental review for route permit applications submitted to the Commission. EERA held scoping meetings on February 20 and February 21, 2024, and has prepared this Environmental Assessment (EA) for the proposed GRE Pilot Knob to Burnsville 115 kV Rebuild and Upgrade Project. This EA addresses the issues required in Minnesota Rules 7850.3700, subpart 4, and those identified in the EA Scoping Decision issued on May 1, 2024.

Following release of this EA, a public hearing will be held. The hearing will be presided over by an administrative law judge (ALJ) from the Minnesota Office of Administrative Hearings. Upon completion of the environmental review and hearing process, the ALJ will provide a summary report to the Commission for its final permit decision. A decision on the route permit for the project is anticipated in Winter of 2024.

For additional information, or if you have questions, contact Commerce staff: Erika Wilder (651-539-1009 or erika.wilder@state.mn.us) or Commission staff: Trevor Culbertson (651-201-2203 or trevor.culbertson@state.mn.us).

Additional documents and information, including the route permit application, can be found on eDockets by searching “23” for year and “410” at: https://www.edockets.state.mn.us/EFiling/search.jsp or the Department of Commerce Energy Environmental Review and Analysis (EERA) webpage https://apps.commerce.state.mn.us/web/project/15299

Introduction

Great River Energy (GRE) is proposing to construct approximately 9 miles of rebuild and upgrade of existing 69 kilovolt (kV) transmission line to 115 kV high voltage transmission line (HVTL).

Under the Power Plant Siting Act, the Minnesota Public Utilities Commission (Commission) is charged with making sure that large electric power facilities are sited in a manner that minimizes adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and fulfillment of electric energy needs in an orderly and timely fashion.[1] For HVTLs, the Commission fulfills this charge through their route permitting process. In the route permitting process:

- Proposers of HVTLs file a route permit application with the Commission;
- The Commission conducts a review of human and environmental impacts with assistance from the Minnesota Department of Commerce (Commerce) Energy Environmental Review and Analysis (EERA). For this project, EERA staff has prepared an environmental assessment;
- A public hearing is conducted by the Office of Administrative Hearings; and
- The Commission then makes a route permit decision. The permit specifies the route for the project and appropriate mitigation measures.

This environmental assessment (EA) provides information on the human and environmental impacts of the proposed project to the public and decision makers. This EA only studies the proposed project. No alternative routes were proposed for study during the scoping period and EERA did not identify any reasonable alternatives to GRE's proposed route. Because there are no route alternatives, the primary permitting decision before the Commission focuses on the conditions in the route permit to mitigate impacts of the project.

Summary of Impacts

GRE provided a proposed route for the project in their application to the Commission. The proposed route largely follows existing rights-of-way (ROW). Construction and operation of the project would impact human and environmental resources in the project area. Most of the impacts would be short-term and are common to any large construction project, such as noise, dust, and soil disturbance. These impacts can be mitigated through standard and site-specific construction practices. Long-term permanent (operational) impacts, such as aesthetics or avian fatalities, cannot be avoided, but can be minimized by routing choices. The project would not impact future development in the area.

The standard mitigation measures included in the Commission's route permit address many impacts of the project. A draft route permit is included in **Appendix C**. The draft route permit contains project-specific mitigation measures that would further reduce the HVTL's impact including measures for:

- Proximity to Radio Antennas
- Adherence to Minnesota Department of Transportation Requirements
- Minimize Effects to Existing Wells
- Wildlife-friendly Erosion Control
- Dust Control

[1] Minnesota Statutes (Minn. Stat.) 216E.02, Subdivision (Subd.) 1

- Facility Lighting
- Vegetation Management Plan
- Protection of Bats
- Protections for Blanding's Turtle
- Protection of Nesting Birds Proximity to Radio Antennas

Document Organization

This EA is organized as follows:

- Section 1 provides a brief overview of the proposed project.
- Section 2 provides information about the state-level regulatory framework.
- Section 3 provides information about other permits and approvals that may be required for the project.
- Section 4 provides description of the design, engineering, and construction of the proposed project.
- Section 5 identifies the potential impacts to human and natural resources and identifies measures to avoid, minimize, or mitigate adverse impacts.
- Section 6 discusses cumulative impacts and unavoidable impacts.

1 SECTION ONE: Project Overview

This section provides information about the proposed project, who would own and construct the project, including a description of the route, rights-of-way requirements, estimated cost, and timeline.

1.1 Project Proposer

The project is proposed by Great River Energy, a not-for-profit wholesale electric power cooperative based in Maple Grove, Minnesota, that provides electricity and energy services for approximately 1.7 million people through its 27 member-owner cooperatives and customers. The project would be located in an area served by the Dakota Electric Association.[2] GRE would own the 8.75-mile 115 kV transmission line from the Pilot Knob Substation to its connection point with the Burnsville Substation, inclusive of the Pilot Knob and Burnsville substations.

1.2 Project Purpose

The project proposed by GRE is needed to:

- Maintain transmission system reliability;
- Prepare for future load growth; and
- Preserve the existing looping system allowing the Deerwood and River Hills substations to serve customers in both directions along the transmission line.

The Deerwood and River Hills substations provide service to Dakota Electric Association's electric cooperative members. The new equipment would meet modern design standards and provide the ability to operate the line at a higher voltage.[3]

1.3 Proposed Project

GRE is proposing to rebuild and upgrade three portions of approximately 9 miles of existing 69 kV transmission lines with structures and conductor capable of operating at 115 kV, located in the cities of Eagan, Burnsville, and Apple Valley, in Dakota County, Minnesota, as provided in **Table 1, Location of the Project**. The project includes the following segments of existing 69 kV transmission to be rebuilt and upgraded:[4]

- Approximately 2.1 miles between the existing Pilot Knob and Deerwood substations;
- Approximately 3.2 miles between the existing Deerwood and River Hills substations; and
- Approximately 3.4 miles between the existing River Hills and Burnsville substations.

Additionally, the existing Burnsville Substation would be upgraded and modified as part of the project.

[2] GRE's Application for a Route Permit to the Minnesota Public Utilities Commission (Application): Docket No: ET2/TL-23-410, Document Nos 202311-200563-02 through 202311-200563-09 and 202311-200564-01 through 202311-200564-04.

[3] Ibid.

[4] GRE refers to the segments internally and in parts of their Application as DA-PLX, DA-PD (Pilot Knob to Deerwood); DA-DE, DA-RE (Deerwood to River Hills); and DA-BR (River Hills to Burnsville).

Table 1 Location of the Project

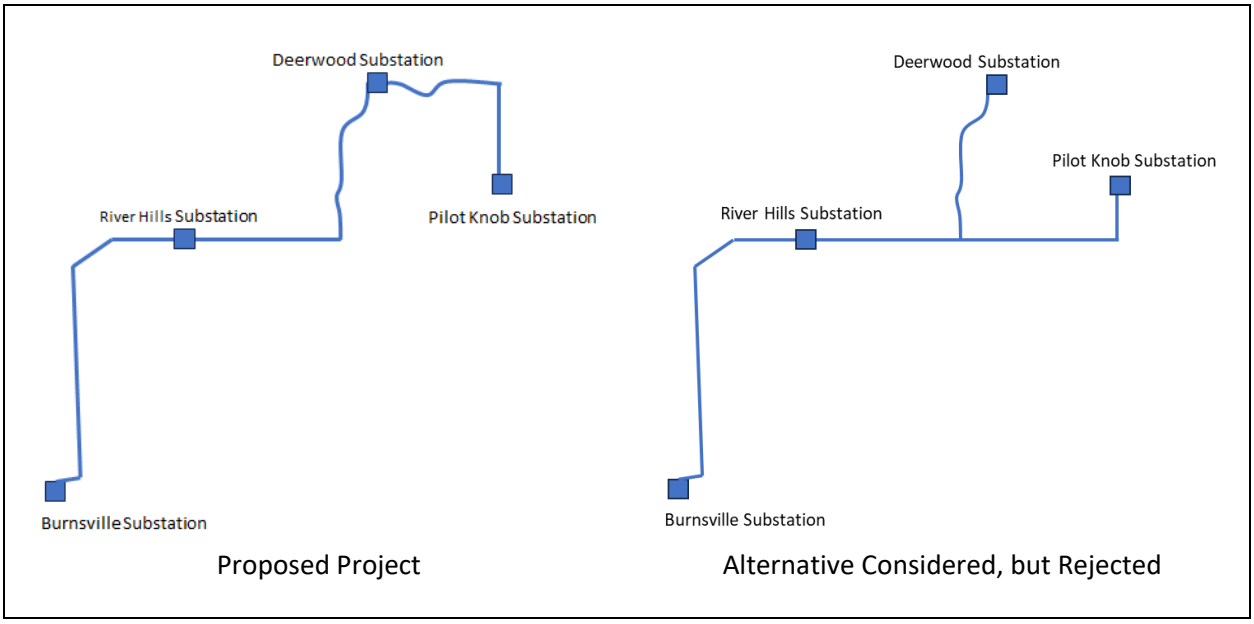
City Name	Township	Range	Sections
City of Eagan	27N	23W	20, 21, 22, 27, 28, 29, 30, 31, 32
City of Burnsville	27N	24W	25, 35, 36
City of Burnsville	115N	20W	17, 20
City of Apple Valley	115N	20W	20

1.4 Alternatives Considered by GRE

GRE identified one other transmission route alternative connecting the Pilot Knob, Deerwood, River Hills, and Burnsville substations and maintain reliability. This alternative rebuild scenario, shown on **Graphic 1**, was evaluated, and rejected for the following reasons:

- Lower reliability: The power supply to the Deerwood Substation would be solely dependent on one transmission line, resulting in lower system reliability.
- Local plans for road widening: Dakota County approached GRE about widening Cliff Road west of Pilot Knob Road. A widening of this road requires the existing line to be placed further into the parcels. However, if the proposed project is built, this segment of transmission line would be decommissioned, and eliminate the need to further impact parcels when moving the transmission line.
- Additional tree clearing and surface water impacts: The existing 69 kV ROW is adjacent to East Thomas and Thomas Lake (Minnesota public waters) and three residential parks: Thomas Lake Park, Clearwater Park, and Well Site Park. Rebuilding and upgrading to a 115 kV transmission line through this area could potentially result in additional tree clearing, wetland impacts, impacts to Minnesota Department of Natural Resources (MDNR)-managed public waters, and recreational impacts, when compared to the proposed route.
- Cultural Resources: A literature review of this route identified two historic structures located adjacent to the existing route, which could be potentially impacted by tree clearing, and associated viewshed impacts to the sites.

GRE selected the proposed route because it minimizes overall impacts.



Graphic 1 Transmission Route Alternatives Considered

1.5 Route Widths and Rights-of-Way

GRE currently has an approximately 70-foot-wide ROW associated with the existing 69 kV transmission line (typically 35 feet on each side of the transmission centerline); where the transmission line follows roads, approximately 30 feet of the ROW overlaps road ROW and approximately 40 feet overlaps private or public property. GRE intends to utilize the existing ROW; however, it is necessary to obtain renewed or amended easements, or new easements where additional space or rights are needed to accommodate the project.

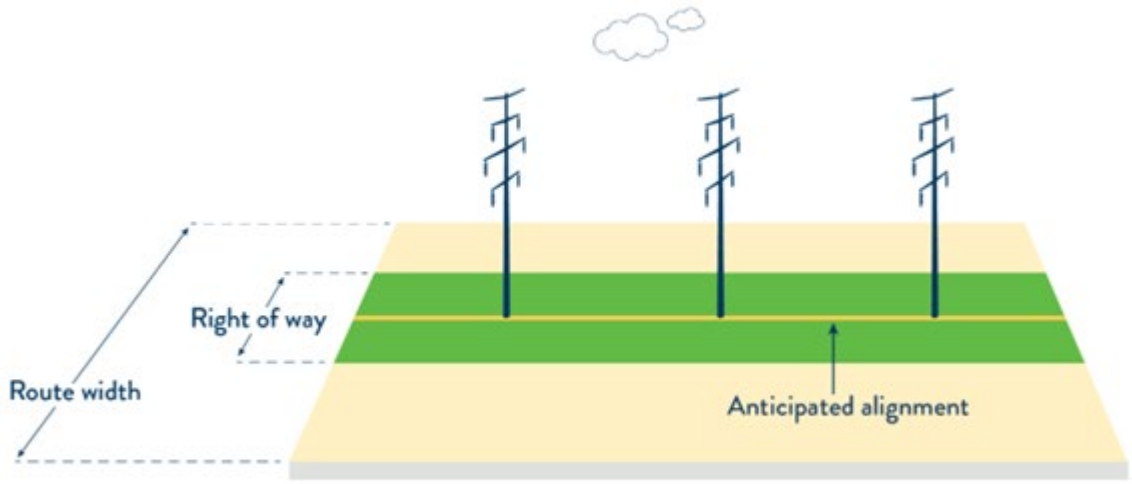
New ROW and easements would be required for the rerouted section along Blackhawk Road and its intersection with Interstate 35E (I-35E). The impacted parcels are currently owned by Dakota County and the Minnesota Department of Transportation (MnDOT). GRE representatives will work directly with landowning agencies to negotiate the necessary easement amendments or new easements.

GRE is requesting the following route widths for the project:

1. The entire 5.4-acre parcel where the Pilot Knob Substation is located.
2. A 400-foot-wide route for approximately 1 mile along Pilot Knob Road to the intersection with Deerwood Drive.
3. A 200-foot-wide route along Deerwood Drive and Blackhawk Road to the I-35E crossing.
4. The entire 2-acre parcel where Deerwood Substation is located.
5. An approximately 500-foot-wide route along the proposed 1,250-foot minor reroute north of Blackhawk Road at the I-35E crossing.
6. A 200-foot-wide route for approximately 1,800 feet along the Blackhawk Road to the intersection at Cliff Road.
7. A 400-foot-wide route for approximately 2.2 miles along Cliff Road to the intersection at State Highway 13.

8. The entire 0.5-acre parcel where the River Hills Substation is located.
9. A 500-foot-wide route for approximately 2,000 feet along State Highway 13.
10. A 400-foot-wide route for 2 miles along County Highway 11.
11. A 200-foot-wide route for approximately 1,000 feet along I-35E to the Burnsville Substation.
12. The entire 5.4-acre parcel where the Burnsville Substation is located to accommodate the substation upgrades and different potential connection points into the substation.

The concepts of alignment, rights-of-way, and route width are shown on **Graphic 2**. The rights-of-way and the route width requested by GRE are shown on **Figure 1, Requested Route Width** in **Appendix A**.



Graphic 2 Route Width and Transmission Alignment

1.6 Transmission Line

The upgraded transmission line includes new structures and wires. The majority of the new 115 kV transmission line would consist of single circuit, horizontal post, or braced post monopole wood structures.[5] Details on structure types are discussed in **Section Four, Engineering, Operational Design, and Construction**.

1.7 Substation Upgrades

The work at the Burnsville Substation would include relocating the point at which the existing transmission line connects to the substation by approximately 450 feet. During the time during which the system is operating at 69 kV, the connection point would remain in the current location on the eastern half of the north side of Burnsville Substation. In the future, when the project is energized at 115 kV, the connection would be transferred to the new location built as part of this project at the western half of the north side of the substation, where the 115 kV electrical equipment is presently located.

[5] Application, p. 4-3

New and upgraded equipment is also planned for Burnsville Substation as described further in **Section 4.1.2, Substation Upgrades**. GRE is working with the City of Burnsville to acquire some land to enable an expansion of the substation to the north and east as well as potentially using their property for staging construction vehicles and equipment. The substation expansion would also necessitate the temporary use of MnDOT ROW for construction activities.[6]

Both the Deerwood and River Hills substations are owned by Dakota Electric Association, and no modifications are anticipated at these substations at this time, other than to connect the upgraded and rebuilt transmission line to the substations.

1.8 Project Timeline and Cost

Construction of the project would be phased to reduce extended outages on the distribution system, and take approximately 24 months over a 27 month period; construction is anticipated to begin in January of 2026 and completed in Spring of 2028. GRE estimates the total cost of the project to be approximately $ 32.8 million.[7] The construction phasing and project costs are shown in **Table 2** and **Table 3**, respectively. All capital costs for the project would be borne by GRE.

Table 2 Anticipated Construction Schedule

	2026				2027				2028			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Deerwood Substation to Pilot Knob Road												
Double circuit line on Pilot Knob Road												
Deerwood Substation to River Hills Substation												
River Hills Substation to Burnsville Substation												

Table 3 Estimated Construction Costs ($ Million)

Project Phase	Transmission Line	Switches	Substation	Total
Planning and State Permitting	$ 1.5	$ <0.1	$ <0.1	$ 1.6
Land Acquisition/ Permits	$ 8.4	$ <0.1	$ <0.1	$ 8.4
Design	$ 0.1	$ 0.4	$ <0.1	$ 1.6
Procurement	$ 5.7	$ 0.6	$ 0.5	$ 6.8
Construction	$ 11.1	$ 0.7	$ 0.3	$ 12.2
Close Out	$ 2.1	$ <0.1	$ <0.1	$ 2.2
Total	**$ 30**	**$ 1.8**	**$ 1.0**	**$ 32.8**

[6] GRE, Correspondence with Commerce, July 10, 2024
[7] Application, pp. 3-4, 3-5.

The estimated annual cost of ROW maintenance and operation of GRE's transmission lines (69 kV to 500 kV) in Minnesota currently average about $ 2,000 per mile. Storm restoration, annual inspections, and ordinary replacement costs are included in these annual operating and maintenance costs.

2 SECTION TWO: State of Minnesota Regulatory Framework

Under the Power Plant Siting Act, the Commission is charged with making sure that large electric power facilities are sited in a manner that minimizes adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and fulfillment of electric energy needs in an orderly and timely fashion. For HVTLs like the one proposed by GRE, the Commission fulfills this charge through their route permitting process. In this process, proposers of projects file an application with the Commission, EERA assists the Commission by reviewing human and environmental impacts of the proposal and alternatives to the proposal, and an administrative law judge (ALJ) presides over a public hearing and compiles the record for the Commission. Finally, the Commission determines which route is most consistent with their charge and what permit conditions are needed to mitigate human and environmental impacts.

2.1 Route Permit Application

Project proposers must apply for (and receive) a route permit from the Commission before building an HVTL. This project meets the definition of an HVTL, defined as a "conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length."[8]

GRE filed a route permit application on November 17, 2024. The application was filed for review under the alternative review process, which allows applicants to present a single proposed route instead of presenting and analyzing multiple routes for the Commission's consideration.[9] GRE requested a route width varying between 200 feet and 500 feet, and provided a proposed alignment for the centerline of the transmission line.

On January 17, 2024, the Commission issued an order accepting the route permit application as substantially complete.[10] After an application is accepted, the permitting process, including environmental review, can move forward.

2.2 Environmental Review

The environmental review process ensures that the Commission and other stakeholders understand the human and environmental impacts of a proposed project before a permit is issued. EERA staff assist the Commission with environmental review by working with stakeholders to identify issues, analyzing impacts of the proposed project or its alternatives, and mitigation measures to minimize the impacts. This allows the Commission to make informed decisions that avoid or reduce impacts to people and the environment, while allowing for reliable and efficient delivery of electricity.

2.2.1 Scoping

Scoping is the process used to determine the topics analyzed in the EA. Scoping focuses on: (1) the most relevant issues and impacts needed for a route permit decision, and (2) identifying and analyzing potential alternatives. The scoping process includes public meetings and comment periods.[11]

[8] Minnesota Rules (Minn. R.) 7850.1000, Subchapter (Subp.) 9
[9] Minn. Stat. 216E.04 and Minn. R. 7850.2800–3900
[10] eDockets Document No. 20241-202249-01
[11] Minn. R. 7850.3700, subp. 2

EERA and Commission staff jointly held scoping and public information meetings as noticed on February 9, 2024, to provide information about the permitting process and the project, answering questions, and gathering input on topics for study in the EA.[12] A remote access meeting was held on February 20, 2024, and an in-person meeting was held at the Diamondhead Education Center in Burnsville on February 21, 2024. The comment period was open from February 9 to March 6, 2024.

EERA provided a generic scope for the EA during the meetings, and issued a Scoping Summary Report on March 27, 2024.[13] The Commission accepted EERA's recommendation that the EA study GRE's proposed route as the sole routing alternative considered in the scoping decision. On May 1, 2024, a scoping decision for the EA was issued and is included in **Appendix B**.[14]

2.2.2 Scoping Comments

EERA received oral and written comments from three members of the public and four public agencies.

Comments from members of the public included:

- Steve Smith (radio station employee) expressed concern with project's potential interference with local radio station;[15]
- Clark Nordberg asked if construction activities along Pilot Knob Road would cause disruption to entries and exits to two Eastern Lutheran Church locations;[16] and
- Shannon Marcus (Border Foods Real Estate Development Assistant) asked if project would impact electrical service or access to the drive-thru at the Taco Bell store at 2000 Cliff Road in Eagan.[17]

Comments from public agencies included:

- Todd Bentley, Dakota County Rights-of-way Permits Manager: Requested clarification on tree clearing required for the project;[18]
- Stacy Kotch Egstad, Minnesota Department of Transportation (MnDOT):[19]
    - Noted that GRE and their contractors should familiarize themselves with both MnDOT's Utility Accommodation on Highway Right of Way Policy and Utility Accommodation and Coordination Manual; and
    - Noted GRE will need to coordinate with MnDOT when planning for oversized loads.
- Cynthia Warzecha, Minnesota Department of Natural Resources (MDNR) recommended:[20]
    - Protections for Blanding's turtle;
    - Minimizing tree removal;
    - Minimizing substation facility lighting impacts on wildlife;

[12] eDockets Document No. 20242-203258-01
[13] eDockets Document No. 20243-204675-01
[14] eDockets Document No. 20245-206259-01
[15] eDockets Document No. 20243-204045-02
[16] Ibid.
[17] eDockets Document No. 20243-204565-01
[18] eDockets Document No. 20243-204045-02
[19] eDockets Document No. 20243-204107-01
[20] eDockets Document No. 20243-204106-01

    - Utilizing non-chloride dust suppressants to control fugitive dust; and
    - The importance of using wildlife-friendly erosion control.
- Angela Torres/Sandi Dingle, Metropolitan Council: Advised there is a Metropolitan Council interceptor within the project area, and GRE needs to contact and coordinate with the Metropolitan Council Environmental Services to obtain an Encroachment Agreement before beginning construction.[21]

2.2.3 Project Alternatives

No route alternatives were proposed during scoping and EERA was not able to independently identify other alternatives for study that meet the project purpose as proposed by the Applicant. No alternative routes or segments are analyzed in this EA.

2.2.4 EA Preparation

EERA derived much of the information used in the preparation of this EA from documents prepared by GRE, including the Route Permit Application for the project. In addition to material provided by GRE, information from the comments received, relevant environmental review documents for similar projects, spatial data, and information gathered during EERA visits to the project area, were also used to prepare this document.

Consistent with the scoping decision, there are some issues that this EA does not address because they are beyond the scope of what is relevant to the Commission's decision-making. Specifically, this EA does not address:

- Any route, route segment, or alignment alternative not specifically identified for study in this scoping decision.
- Any system alternative (an alternative to the proposed transmission line project).
- Potential impacts of specific energy sources.
- The manner in which landowners are paid for transmission line right-of-way easements.

2.3 Public Hearing

A public hearing will be held after the EA is issued.[22] An administrative law judge from the Office of Administrative Hearings conducts the public hearing. The hearing is an opportunity for interested persons to comment on the project, the EA, and the upcoming Commission's permit decision. People can do this by attending the hearing and speaking, presenting evidence, asking questions, and making comments. Written and oral comments received during the hearing become part of the record in the proceeding. EERA staff will be available to respond to questions and comments about the EA. These questions and answers become part of the record, but staff does not revise or supplement the EA document.

After the public comment period is over, the ALJ provides a report and a recommendation to the Commission based on all of the information in the record.

[21] eDockets Document No. 20243-204563-01
[22] Minn. R. 7850.3800, Subp. 1

2.4 Route Permit Decision

Once the Commission has received the ALJ's report, they schedule a meeting to decide on issuing permit. When the Commission issues a route permit it draws on the record (application, comments, environmental review, and all other documents in the project docket) to approve a route, route width, and an anticipated alignment. Route permits also outline conditions specifying construction and operation standards and mitigation measures that must be taken to reduce project impacts. A draft route permit is included in **Appendix C**.

At the Commission meeting for permitting the project, the Commission will weigh human and environmental factors in its decision. The specific factors the Commission must weigh are specified in statute and rule and include the following.

Minnesota Statutes 216E.03 lists considerations that guide the study, evaluation, and designation of route permits. Minnesota Rule 7850.4100 lists the factors the commission must consider 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 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.

The Commission is also guided by the "state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric energy security through efficient, cost-effective power supply and electric transmission infrastructure."[23]

The Commission must make a final decision on the route permit within 60 days after receiving the ALJ report. A final decision must be made within six months after the Commission's determination the application is complete; however, this time limit may be extended for up to three months for just cause

[23] Minn. Stat. 216E.03, Subd. 7(a)

or upon agreement of the applicant. A decision by the Commission on a route permit application for the project is anticipated Winter of 2024.

The HVTL must be constructed within the Commission's designated route and along the anticipated alignment unless subsequent permissions are requested and approved by the Commission. "Any right-of-way modifications within the designated route [must be] located so as to have comparable overall impacts relative to the factors in Minnesota Rule 7850.4100 and shall be specifically identified and documented in and approved as part of the plan and profile."[24] Modifications to the anticipated alignment generally result from landowner requests or unforeseen conditions.

[24] Sample Route Permit, eDockets Document No. 20242-203174-01

3 SECTION THREE: Other Permits, Approvals, and Applicable Codes

A route permit from the Commission is the only state permit required for routing the project. The Commission's route permit supersedes local planning and zoning and binds state agencies. Thus, state agencies like MDNR and MnDOT are required to participate in the Commission's permitting process to aid the Commission's decision-making and to indicate routes that are not permittable.

After the Commission issues a route permit, however, various federal, state, and local permits may be required for activities related to the construction and operation of the project in the route that the Commission has authorized. All permits subsequent to the Commission's route permit, and necessary for the project (commonly referred to as "downstream permits"), must be obtained by a permittee. **Table 4** identifies potential permits that might be required in addition to the Commission's route permit.

Table 4 Permitting Authorities and Potential Permits

Federal	
US Army Corps of Engineers	Section 404 of the Federal Clean Water Act
US Fish and Wildlife Service	Threatened and Endangered Species Consultation
Federal Aviation Administration	Airport Obstruction Evaluation
State of Minnesota	
Department of Natural Resources	Endangered Species Consultation
	Temporary Construction Dewatering Permit
	Water Appropriation Permit
Department of Transportation	Oversize and/or Overweight Permit
	Utility Accommodation on Trunk Highway ROW
	Miscellaneous Work Permit for Trunk Highways
Pollution Control Agency	National Pollutant Discharge Elimination System Permit for Construction Stormwater Discharge
	Clean Water Act Section 401 Certification
Minnesota Department of Health	Wellhead Protection
State Historic Preservation Office	National Historic Preservation Act, Minnesota Field Archaeology Act, and Minnesota Historic Sites Act
Board of Water and Soil Resources, County, Cities	Wetland Conservation Act

Local	
Dakota County, Cities	Road Crossing/ Right-of-way Permits
	Road Closure/Lane Closure
	Overwidth Load Permits

3.1.1 Federal Permits

The United States Army Corps of Engineers (USACE) "regulates the discharge of dredged or fill material into waters of the United States, including wetlands." Dredged or fill material could impact water quality. A permit is required from USACE if the potential for significant adverse impacts exists.

A permit is required from the United States Fish and Wildlife Service (USFWS) for the incidental "taking" of any federally listed species. As a result, USFWS encourages project proposers to consult with the agency to determine if a project has the potential to impact federally listed threatened and endangered species. Additionally, consultation can lead to the identification of mitigation measures for potential impacts associated with the project.

The Federal Aviation Administration (FAA) ensures the safety of air navigation and the efficient utilization of navigable airspace by aircraft. The FFA requires that anyone building a structure near an airport submits FAA Form 7460, at which point the FAA initiates an Obstruction Evaluation / Airport Airspace Analysis process, and determines if additional safety measures are required, such as marker balls or beacon lights.

3.1.2 State Permits

Potential impacts to state lands and waters, as well as fish and wildlife resources are regulated by MDNR. Utilities are required to obtain a License to Cross State Lands and Waters. Projects affecting the course, current, or cross-section of lakes, wetlands, and streams that are public waters may require a Public Waters Work Permit. Not unlike the USFWS, MDNR encourages project proposers to consult with the agency to determine if a project has the potential to impact state-listed threatened or endangered species. Consultation can lead to the identification of mitigation measures for potential impacts associated with the project, depending on the potential for the project to affect natural resources under their jurisdiction.

A permit from MnDOT is required for construction, placement, or maintenance of utility lines adjacent or across trunk highway rights-of-way. MnDOT requires these permits to ensure that use and occupancy of the right-of-way does not interfere with the free and safe flow of traffic, among other reasons.

The Minnesota Pollution Control Agency (MPCA) regulates generation, handling, and storage of hazardous wastes, regulation of pollutants. Construction projects that disturb one or more acres of land require a general National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater Permit from the MPCA. GRE anticipates its ground disturbance to be under an acre, and the project would not require coverage under the construction stormwater permit.[25]

[25] Application, p. 7-35

A Clean Water Act Section 401 Water Quality Certification from MPCA may also be required. Section 401 of the Clean Water Act requires that persons conducting activities that may result in a discharge of a pollutant into waters of the United States obtain certification from relevant States that the discharge complies the applicable water quality standards.

The Minnesota Department of Health (MDH) protects, maintains, and improves the health of all Minnesotans, and assures the water and food are safe to drink and eat. It also assures the proper construction of new wells and borings, and the proper sealing of unused wells and borings.

Minnesota's State Historic Preservation Office (SHPO) is charged with preserving and protecting the state's historic resources. Project proposers consult with SHPO and state agencies to identify historic resources to avoid and minimize impacts to these resources.

The 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.

3.1.3 Local Permits

Commission route permits preempt local zoning, building, and land use rules, regulations, or ordinances promulgated by regional, county, local, and special purpose government; however, coordination with local governments may be required for the issues listed below:

- Public Lands: Coordination would be required to occupy county or city lands such as park lands and other properties owned by these entities.
- Overwidth Load: Coordination may be required to move over-width or heavy loads on county or city roads.
- Road Crossing and Right-of-Way: Coordination may be required to cross or occupy county or city road rights-of-way.
- Road or Lane Closure: Coordination may be required to close a street or lane to accommodate construction.

3.1.4 Applicable Codes

In addition to these downstream permits, all transmission lines, regardless of route location, must meet requirements of the National Electrical Safety Code (NESC) for HVTLs. NESC standards are designed to safeguard human health "from hazards arising from the installation, operation, or maintenance of … overhead and underground electric supply and communication lines." They also ensure that the transmission line and all associated structures are built from materials that withstand the operational stresses placed upon them over the expected lifespan of the equipment, provided routine operational maintenance is performed.

Route permits issued by the Commission require permittees to 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.

4 SECTION FOUR: Project Engineering, Construction, and Operation

Construction begins after a route permit is issued and all the necessary downstream permits have been obtained. The project must be constructed according to the design and construction procedures outlined in the route permit application, applying any mitigation that is required by permit. This section summarizes the engineering and construction of the proposed project details in the route permit application and subsequent correspondence with GRE, as noted.

4.1 Engineering and Design

The proposed project is an upgrade and rebuild of an existing 69 kV transmission line to a transmission line capable of operating at 115 kV in the future. The following sections provide an overview of design considerations and typical equipment utilized in a voltage upgrade like the proposed project. Specific type and sizing of structures and equipment would be determined after a route permit is issued and detailed engineering design is initiated.

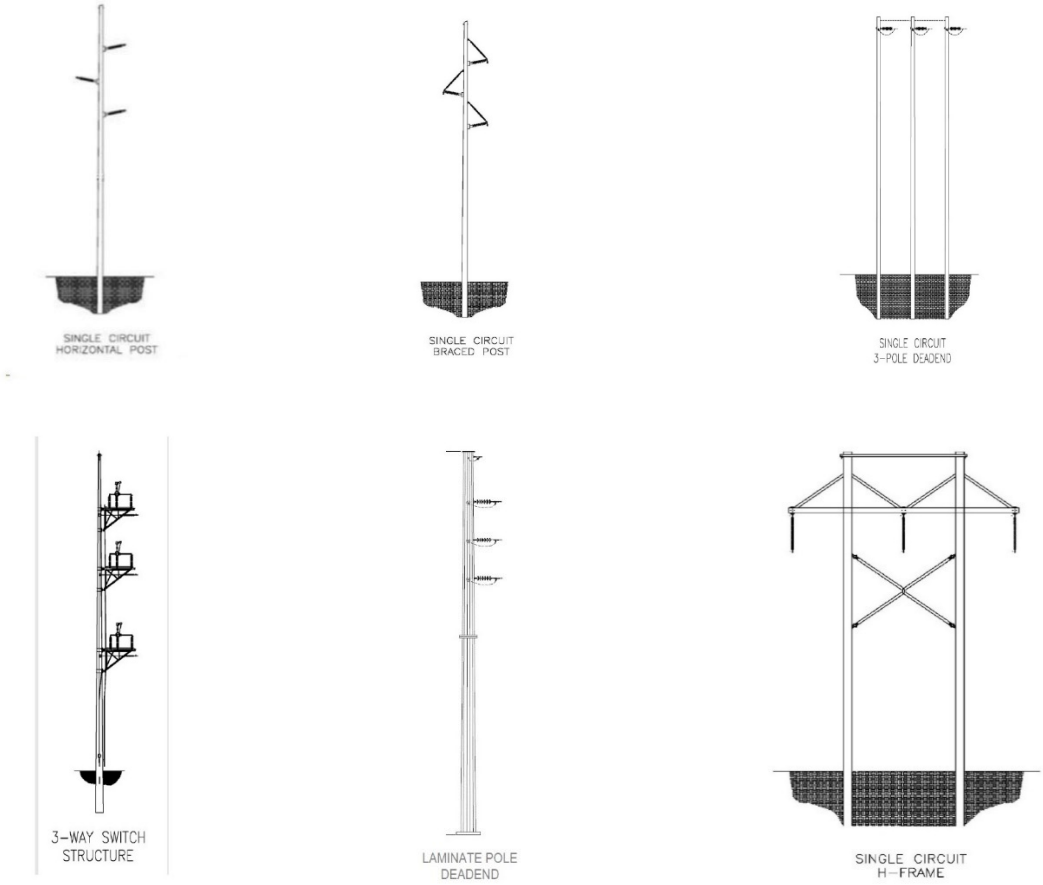
4.1.1 Transmission Structures and Equipment

The majority of the new 115 kV transmission line would consist of single circuit, horizontal post, or braced post direct-imbedded monopole steel structures spaced approximately 300 to 400 feet apart. Transmission structures would typically range in height from 65 to 100 feet above ground, depending upon the terrain and environmental constraints. Other types of structures would be used as necessary. Multi-pole (e.g., 3-pole dead-end) or H-frame structures are designed in a horizontal configuration, which maintains the transmission line conductors parallel to the ground. Horizontal configuration is sometimes desirable where the proposed transmission line crosses under other existing high voltage transmission lines. The horizontal configuration allows the transmission line to be as low as possible at the crossing point, while still maintaining the required clearances set by the National Electrical Safety Code.

A dead-end structure is used to change direction or wire tension on a transmission line. Dead-end structures are also used as a “storm structure” 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 can be wood, wood laminate, direct steel embedded, or steel on concrete foundation structures, and can have a larger cross section than the typical structures. A summary of structure types and characteristics is presented in **Table 5** below. These structure types are shown in **Graphic 3, Transmission Structure Types**.

Table 5 Typical Structure Types and Dimensions

Structure Type	Material	Approximate Height Above Ground (feet)	Structure Base Diameter (inches)	Span Between Distances (feet)
Monopole with horizontal post or braced post	Wood, steel, or ductile iron	65 - 100	22 - 40 (direct embed); 60 - 82 (concrete foundation)	300 - 400
H-Frame	Wood, steel, or ductile iron	65 - 100	22 - 40	350 - 800
Three-pole	Wood, steel, or ductile iron	65 - 100	22 - 40	350 – 800



Graphic 3 Transmission Structure Types[26]

[26] Source for images: GRE Application, page 4-2 for structure drawings; please note these drawings do not show bundled conductor proposed by the project. The visual simulation shows bundled conductor; however, a 161 kV transmission line is shown in the simulation, and as such, the transmission equipment for GRE's proposed project would have shorter insulators and the conductor phases would be closer together (image source: https://www.nytimes.com/2022/05/31/business/energy-environment/florida-power-light-electric-line.html).

Single circuit structures would have three phases of bundled conductor wires[27] and one shield wire. It is anticipated that the phase wires would be 795 thousand circular mil aluminum-clad steel supported (795 ACSS) or a conductor with similar capacity. The shield wire would be 0.528 optical ground wire. Under certain conditions, the shield wire may be buried between structures.

NESC sets minimum clearances of the conductors from structures adjacent to or within the ROW. NESC clearance requirements are summarized in **Table 6** below. In addition to the NESC requirements, GRE typically requires the blowout to remain within the ROW under a more extreme wind condition of 94 mph. The amount of blowout is dependent on a number of factors including the span length and conductor type. On a typical 115 kV transmission line with a 300-foot span, blowout is approximately five feet with 48 mph winds and approximately eight feet with 94 mph winds. The final line design evaluates blowout based on actual span distances and the type of conductor being used.

Table 6 NESC Clearance Requirements for 115 kV Transmission Conductor

Risk Case	Minimum Separation (feet)	
	No Wind	NESC 45 mph wind
From a lighting support, traffic signal support, or support structure for another line	9.1	8.6
From any other buildings, walls, projections, structures, bridges, etc.	11.6	8.6

Minimal to no guying is anticipated for the project. Guying provides additional support to keep the transmission pole in position. Guys are typically shorter (stub) poles or stakes that are installed with a cable or wire under tension and connected to the transmission pole. If guying becomes necessary, additional right-of-way is acquired as necessary to incorporate the guy wires and stub poles or stakes that would be located outside of the 70-foot right-of-way.

4.1.2 Substation Upgrades

In addition to shifting the rebuilt and upgraded 69 kV transmission to the west side of Burnsville Substation to facilitate operation of the system at 115 kV in the future, GRE is also proposing the removal of existing bus work, and installation of new bus work, new breakers, and new control equipment at the substation. These upgrades require an expansion of the substation's footprint by approximately 0.06 acre.

4.1.3 Design Options to Accommodate Future Expansion

Minnesota statutes and rules require the consideration of the potential for a project to accommodate future improvements to the transmission system. GRE has proposed the project to maintain reliability requirements in the area, and to have the ability to operate the system at 115 kV when electric loads increase.

[27] GRE requested bundled conductor be added to the project description and analyzed in the EA (Communication, GRE to Commerce, June 18, 2024)

4.2 Construction

All construction would be completed in accordance with state, NESC, and GRE construction standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, erection of structures, and stringing of transmission line conductors. Construction would not begin until all the necessary approvals and land rights have been obtained, and final design is complete. GRE anticipates construction to begin in 2026.

4.2.1 Right-of-Way Preparation

After land rights have been secured and prior to any construction activities starting, landowners would be notified of the project schedule and other related construction activities. In addition to permanent easements necessary for the construction of the line, agreements may be obtained from certain landowners for temporary construction or staging areas for storage of poles, vehicles, or other related items.

Transmission line construction activities would begin by survey staking of the transmission line centerline and pole locations, followed by removal of trees and other vegetation from the ROW. The width of the ROW would be cleared of vegetation for construction to ensure safe and reliable access and construction. All materials resulting from clearing operations would either be stacked outside of the ROW for use by the property owner, removed and disposed of otherwise as agreed to with the property owner during easement negotiations, or in accordance with agency requirements.

4.2.2 Structure Installation

The second phase of construction would involve structure installation and stringing of conductor wire. During this phase, existing underground utilities are identified along the route through the required Gopher State One Call process.

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 vehicle or installation equipment cannot safely access or perform construction operations properly near the structure, minor grading of the immediate terrain may be necessary. The new structures would generally be installed five to ten feet from the existing structures.

The majority of the proposed structures would be directly imbedded steel poles, which would be installed by augering a hole approximately 10 to 20 feet deep and three to five feet in diameter for each pole. After a direct embedded pole is set into the hole, the void space would be backfilled with crushed rock. In some cases, soil conditions warrant the use of a galvanized steel culvert to be installed vertically in the boring with the structure set inside, and backfilled like a direct-imbed pole. Any excess soil from the excavation would be spread and leveled near the structure in uplands, or removed from the site if requested by the property owner or regulatory agency.

For poles with concrete foundations, borings are typically five to eight feet in diameter and 15 to 45 feet deep with one foot exposed above the existing ground level. Concrete trucks would be used to bring the concrete in from a local concrete batch plant, and after the concrete cures, the pole would be bolted to the foundation.

4.2.3 Conductor and Shield Wire Stringing

After a number of structures have been erected, conductor and shield wire would be attached to the structures. GRE would establish stringing setup areas within the permanent ROW or temporary ROW as negotiated with the landowner. These stringing setup areas would be located at dead-end structures and occupy approximately 15,000 square feet for linear segments of the line and approximately 30,000 square feet for angled segment of the line.

The existing transmission conductor and shield wire would be transferred from the existing 69 kV structures to the new 115 kV structures, and the existing conductor would be used to pull the new conductor through the new structures, to be attached to the insulators at their designated positions. As needed, temporary guard or clearance structures would be installed over existing distribution or communication lines, streets, roads, highways, or other obstructions. The guard structures ensure that conductor would not obstruct traffic or contact existing energized conductors or other cables. The guard structures are temporary, and would be removed after use.

All necessary transmission outages are coordinated in accordance with Midcontinent Independent System Operator (MISO) requirements and procedures that are established and followed by all MISO members to meet personnel safety and NESC transmission grid reliability requirements. Coordination involves well-defined outage scheduling procedures, allow for study affirmation, and ultimately, approval of the submitted outage. Once approved, detailed switching orders are developed and shared with all parties involved using well-defined processes to ensure safety of personnel performing the work. While distribution systems are not subject to MISO requirements, GRE would also coordinate outages with Dakota Electric Association.

4.2.4 Removal of the 69 kV Structures

Existing 69 kV structures would be removed by first removing existing equipment from the structures and then pulling the existing poles from the ground using a crane. Sometimes, it is necessary for some soil to be excavated from around the base of the structure. The holes are then backfilled with clean fill.

4.2.5 Substation Upgrade Construction

At Burnsville Substation, the removal of existing bus work, installation of new bus work, new breakers, and new control equipment would require cranes, flatbed trucks, demolition of existing foundations, excavation and installation of new foundations, and installation of new equipment.

Other than removal of the existing transmission line and connecting the upgraded transmission line to the existing buses at Pilot Knob, Deerwood, and River Hills substations, no additional construction would take place at these substations as part of this project.

4.2.6 Restoration

Following construction, areas used for construction would be restored to their original condition, to the extent possible. Restoration activities include removing and disposing of debris, and reseeding areas disturbed by construction activities with vegetation similar to that which was removed, using a seed mixture certified as free of noxious or invasive weeds. In cases where soil compaction has occurred, the construction crew or a restoration contractor can use various methods to alleviate compaction, or another method as negotiated with the landowner.

GRE would contact landowners to determine if the restoration measures have been to their satisfaction, and if any other damage may have occurred. If damage has occurred to crops, fences, or property, GRE would 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.

4.2.7 Construction Personnel and Equipment

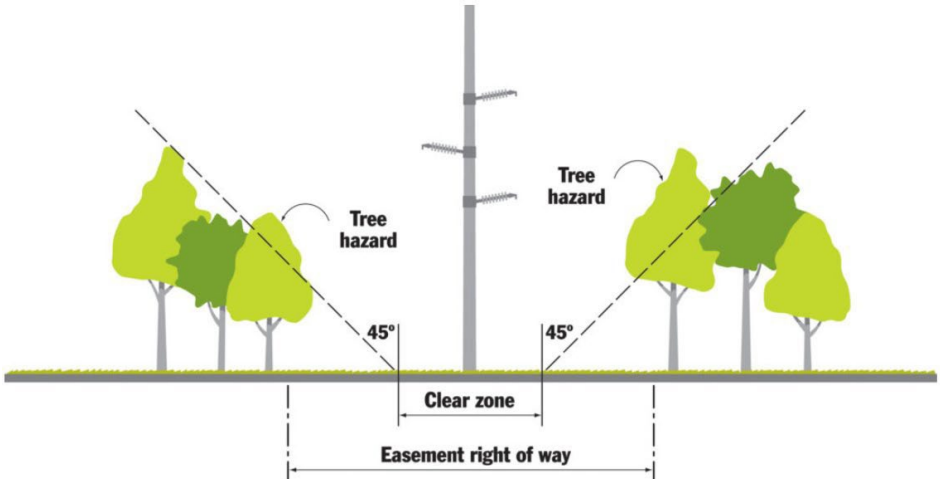
GRE anticipates 15 to 25 daily contract workers would be utilized during construction of the project. GRE would also have a construction supervisor onsite throughout the construction phase.

Construction equipment for project construction would include boom trucks, skid steers, cranes, backhoes, and assorted small vehicles.

4.3 Operation and Maintenance

GRE would periodically perform inspections, maintain equipment, and repair damage to the transmission line. Regular maintenance and inspections would be performed over the life of the facility to ensure a reliable system. Annual inspections would be done by foot, snowmobile, All-Terrain Vehicle, pickup truck, or by aerial means. These inspections are limited to the acquired ROW and areas where obstructions or terrain require access outside of the transmission line ROW, but within the terms of the easement. If property damage occurs during inspection, maintenance, or repair, GRE would restore damage, or the landowner would be provided reasonable compensation for the damage to the property.

The ROW would be managed to remove vegetation that interferes with the operation and maintenance of the transmission line. GRE would use an integrated vegetation management plan that incorporates a wire / border zone practice for ROW clearing and maintenance, as shown on **Graphic 4, Vegetation Clearing**. As a general practice, low-growing brush, or tree species are allowable at the outer limits (e.g., the “border zone”) of the easement area. Taller tree species that endanger the safe and reliable operation of the transmission facility would be removed. In developed areas and to the extent practical, existing low-growing vegetation that does 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 (e.g., the “wire zone” or “clear zone”) would be cleared of all shrubs and trees to ensure maintenance trucks can access the line and no vegetation interferes with the safe operation of the transmission line.



Graphic 4 Vegetation Clearing

The NESC states that "vegetation that may damage ungrounded supply conductors should be pruned or removed." Trees beyond the easement area that are in danger of falling into the energized transmission line, could grow into the wire zone or are otherwise deemed to be a hazard to the safe operation of the line (e.g., "danger trees") may be removed or trimmed to eliminate the hazard as shown in **Graphic 4**. Danger trees generally are those that are dead, diseased, weak, or leaning towards the energized conductor. Tree trimming may be possible to minimize tree removal, and would be based on negotiations with individual landowners.

GRE's vegetation management practice generally provides for the inspection of 115 kV transmission corridor every two years to determine if clearing is required. ROW clearing practices include a combination of mechanical and hand clearing, along with herbicide application (where allowed), to remove or control vegetation growth.

5 SECTION FIVE: Affected Environment, Potential Impacts, and Mitigation

Section 5 describes the environmental setting, affected resources, potential impacts, and mitigation.

Construction and operation of the project would impact human and environmental resources in the project area. Some impacts would be short term and like those of any large construction project (e.g., noise, dust, soil disturbance). These impacts are independent of the route selected for the project. However, they can be mitigated by measures common to most construction projects, for example, the use of erosion control blankets or watering for dust control.

Other impacts would exist for the life of the project, such as aesthetic impacts. 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 where it is located and its design. Long-term impacts can be mitigated through prudent selection of the route and design of the project.

Impacts vary based on duration, size, intensity, and location. This context is used to determine an overall resource impact level using qualitative descriptors. These descriptors ensure a common understanding among readers and allow for comparison of resource impacts between alternatives.

> **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 or rare and unique resources.
>
> **Direct**: Direct impacts are caused by the project and occur at the same time and place.
>
> **Indirect**: An indirect impact is caused by the project but is further removed in distance or occurs later in time.

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 particular 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.

Potential impacts to human and environmental resources are analyzed within specific geographic areas called regions of influence (ROIs). Impacts to resources may extend beyond these distances but are expected to diminish quickly. ROIs vary between resources. **Table 7** summarizes the ROIs used in this EA.

Table 7 Regions of Influence for Human and Environmental Resources

Resource Category	Resource Type	Region of Influence
Human Settlement	Displacement, Land Use and Zoning	Route Width
	Aesthetics, Noise, Property Values, Electronic Interference, Hazardous Materials	Project Vicinity*
	Cultural Values, Recreation, Public Services	Project Area+
	Socioeconomics, Environmental Justice	County
Public Health and Safety	Electric and Magnetic Fields, Stray Voltage, Induced Voltage, Worker and Public Safety	Route Width
Land-Based Economies	Agriculture, Forestry, Mining	Route Width
	Tourism	Project Area
Archaeological and Historic Resources	—	Project Area
Natural Environment	Geology and Groundwater, Soils, Vegetation	Route Width
	Air Quality, Water Resources, Wildlife, Rare and Unique Resources	Project Vicinity
	Greenhouse Gases, Climate Change	State

Notes:

* Project Vicinity is the area within 1,600 feet of the route width.

+ Project Area is the area within one mile of the route width.

This section describes the existing resources that may be impacted by the project, assesses potential project impacts, and identifies measures that to mitigate project impacts. The effect of HVTLs on the human and natural environment are well documented, and the general impacts and mitigation are well understood. Where relevant, this EA draws on the existing body of work.

The level of detail in the analysis in this section focuses on decisions about potential mitigation. Therefore, where a quantitative data analysis is relevant to the selection of appropriate mitigation, impact numbers are presented. However, where a more qualitative discussion of the nature and magnitude of impacts is sufficient to inform decisions regarding mitigation, detailed data analysis has not been included.

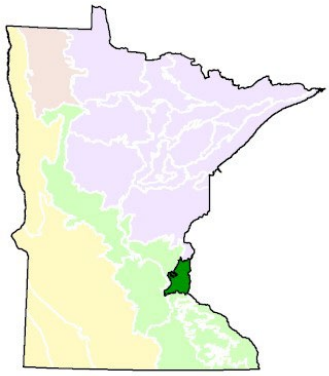
Because there is only one route under consideration, the Commission's permitting decision centers on avoiding and minimizing impacts consistent with state goals to conserve resources, to minimize environmental impacts, and to minimize human settlement and other land use conflicts.

Finally, where other planned projects would have overlapping impacts on the resources affected by the proposed project, these cumulative effects have also been evaluated.

5.1 Environmental Setting

The project area is situated within a developed suburban setting, approximately 13 miles south of downtown Minneapolis. This area is within the St. Paul-Baldwin Plains and Moraines Subsection of the Eastern Broadleaf Physiographic Province as shown on **Graphic 5, Physiographic Province**.[28] The landscape was formed by glaciers and water, as the glacial lakes associated with the last glacial advance contributed large volumes of meltwater to area rivers that cut deep valleys into the sediment and bedrock. The project generally follows the shape of the Minnesota River, approximately 1 to 2 miles northwest of the project. Surface topography is gently rolling, accommodating ponds, lakes, and short streams.

Soils on the glacial moraines are mixed (clay loams, loams, sandy loams, and loamy sands); the outwash plains have more sandy materials. Prior to Euro-American settlement, vegetation in this region was predominantly oak and aspen savanna, but areas of tallgrass prairie and maple-basswood forest were common. The Eastern Broadleaf Physiographic Province coincides roughly with the part of Minnesota where precipitation approximately equals evapotranspiration; within the province, many forest species reach their western range limits and several prairie species reach their eastern range limits. Precipitation in the area is approximately 32 inches per year.[29]



Graphic 5 Physiographic Province

Residences are prominent in the project area, with a population density ranging from approximately 2,000 to 6,000 persons per square mile;[30] land use is dominated by residential and commercial development.

[28] https://www.dnr.state.mn.us/ecs/222/index.html
[29] https://arcgis.dnr.state.mn.us/ewr/climatetrends/
[30] https://maps.geo.census.gov/ddmv/map.html

The project crosses I-35E four times, parallels State Highway 13 for less than a half mile, and crosses State Highway 77. At the Dakota County road level, the project parallels County Highway 31 for 1 mile, crosses County Highway 30 twice, and parallels County Highways 32 and 11 for approximately 2 miles each roadway. **Figure 1, Requested Route Width**, shows these roadways in relation to the project.

There are several existing transmission lines in the area. A 345 kV transmission line runs east-west south of the Pilot Knob Substation, and is crossed by the project near the I-35E crossing between Deerwood and River Hills substations. There are several 115 kV and 69 kV transmission lines connected to Pilot Knob and Burnsville substations. There are three 69 kV transmission lines connected to Pilot Knob Substation, and three 115 kV and two 69 kV transmission lines connected to Burnsville Substation.

5.2 Human Settlement

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 the project area, displace homes or businesses, introduce new noise sources, lower property values, be incompatible with local zoning, or interfere with electronic communications.

Impacts to human settlements resulting from the project are anticipated to range from minimal to potentially significant. Impacts to human settlements can be minimized by prudent routing (e.g., by choosing routes and alignments that avoid residences, businesses, and other places where people congregate). Impacts could also be mitigated by limiting the aesthetic impacts of the structures themselves and by the use of structures which are, to the extent possible, compatible with human settlements and activities.

5.2.1 Aesthetics

Aesthetic and visual resources include the physical features of a landscape such as land, water, vegetation, and structures. Determining the relative scenic value or visual importance of these features is a complex process that depends on what individuals perceive as being aesthetically appealing. Viewers' perceptions are based on their psychological connection to the viewing area and their physical relationship to the view, including distance to the structures, perspective, and duration of the view. Landscapes which are, for the average person, harmonious in form and use are generally perceived as having greater aesthetic value. Infrastructure which is not compatible with a landscape or negatively impacts existing features of a landscape could negatively affect the aesthetics of an area.

Northern Dakota County is heavily developed, with land in the area predominantly used for housing and commercial uses. Landscapes are largely manicured, with some interspersed natural areas.

5.2.1.1 Impacts

Design standards for a 115 kV line require taller structures than for 69 kV lines, and the new poles are expected to be 10 to 20 feet taller than existing poles. The rebuild of the existing line would occupy the same alignment in most places, but the poles would be larger and taller, have larger insulators attached to the poles, and the conductor more prominent. The number of structures within 200 feet of the alignment is presented in **Table 8**.

Table 8 Structures within 200 Feet of the Alignment

Building Type	0 - 50 feet	50 - 100 feet	100 - 150 feet	150 - 200 feet	Total
Home	15	51	70	9	**145**
Business	5	9	14	6	**34**
Outbuilding	2	7	8	44	**61**
Total	**22**	**67**	**92**	**59**	**240**

Source: Application, p. 7-3

In addition, the tree clearing and trimming associated with construction and operation of the project may be perceived as a visual disruption. The visual impact of the project largely depends on the perceptions of observers, but overall impacts of the project would be substantially similar to present conditions.

5.2.1.2 Mitigation

Although minor, aesthetic impacts cannot be fully avoided. GRE is committed to working with landowners on pole placement and alignment adjustments. Efforts to mitigate visual impacts include:[31]

- Location of structures, ROW, and other disturbed areas will be determined by considering input from landowners to minimize visual impacts.
- Care shall be used to preserve the natural landscape. Construction and operation shall be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings in the vicinity of the work.
- Landowners may be compensated for the removal of trees and vegetation based on easement negotiations.
- Structures will be placed at the maximum feasible distance from trail and water crossings, within limits of structure design and applicable regulations.

5.2.2 Cultural Values

Cultural values can be described as shared community beliefs or attitudes, among a given area or population that define what is collectively important and worthwhile to the group. Major infrastructure projects can be inconsistent with the cultural values of an area, resulting in a deterioration of a community's shared sense of itself.

The City of Eagan hosts several community events throughout the year including the historic Holz Farm, Winter Art Sale, Big Rig Rally, Bow Wow-a-Rama, Food Truck Festival, Halloween Trail Walk, and Craft and Gift shows.[32] The City of Burnsville holds several events throughout the year, including the International Festival, live music at Buck Hill, Canterbury Park Racetrack, and the Burnsville Festival & Fire Muster.[33] Apple Valley hosts several annual community events including Freedom Days, Mid-Winter

[31] Application, p. 7-3
[32] https://www.exploreminnesota.com/profile/enjoy-eagan/2068
[33] https://burnsvillemn.com/

Fest, Fall Clean-up Day, Night to Unite and Music in Kelley Park.[34] The Minnesota Zoo is located within the City of Apple Valley.

5.2.2.1 Impacts

Construction and operation of the project is not likely to impact cultural values in the project area. There may be local disruptions along roadways during construction, but any adverse effects would be of short duration and specific to the project area. No mitigation is proposed.

5.2.3 Displacement

Displacement is the need to remove structures (e.g., homes, businesses) to facilitate the construction and operation of the project.

5.2.3.1 Impacts

No residences or businesses are anticipated to be permanently displaced by the project. The transmission line would be designed in compliance with local, state, NESC, and GRE's internal standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings (including residences), strength of materials, and ROW widths.

During scoping, comments raised by the public included the potential for disruption to entrances and exists at local churches and businesses, as well as outages of electrical service during construction. **Section 5.2.10, Public Services and Infrastructure**, analyzes impacts to public roads and electrical service. Lane closures on roadways required during construction would be coordinated with the local jurisdictions; and if private driveway use is needed, GRE would coordinate with the property owner. Additionally, GRE would coordinate electrical service outages with Dakota Electric Association to avoid or minimize disruptions to service in the area. As a result, impacts to ingress and egress from private driveways and from disruptions of area businesses would be minimal.

5.2.3.2 Mitigation

Impacts to area businesses and churches would be minimized by:

- GRE's coordination of roadway lane closure with local jurisdictions;
- GRE's coordination with landowners regarding private driveway use during construction, if needed; and
- GRE's coordination with Dakota Electric Association for electrical service outages.

5.2.4 Electronic Interference

This section summarizes the potential impacts of the project on electronic communications and communication devices, including radios, televisions, and microwave communications.

Electronic interference refers to an electronic signal disturbance that impairs the proper functioning of an electronic device. High voltage transmission lines can interfere with electronic communications (radios, two-way radios, TV, and microwave communication) in two ways. First, corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that communication signals are transmitted. This noise is not sound, but rather electromagnetic signals that

[34] https://www.ci.apple-valley.mn.us/286/Annual-Events

can cause interference with the reception of communications depending on the frequency and strength of the signal. Second, transmission structures can physically block communication signals through a "shadowing" effect. GPS is typically not affected by transmission lines.

5.2.4.1 Impacts

Impacts from corona "noise" primarily occur in the radio frequency range. Radio interference from transmission lines is most relevant for AM signals. It typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way to either side of the transmission line.

During scoping, Steve Smith expressed concern with the project's interference with antennas associated with AM 980 KKMS on the south side of Cliff Road. GRE has subsequently been in discussions with the radio station regarding clearance requirements from the antennas and the potential for radio interference from the transmission line. GRE confirmed with its construction contractor they have the ability to adequately ground their construction equipment while working near the antennas, and both parties have agreed to conduct a joint radio interference study during final engineering, when the locations and height of the transmission equipment along Cliff Road is known. Induced voltage issues associated with operating the transmission line itself are analyzed in **Section 5.3.3, Induced Voltage**.

For FM radio, FM radio receivers usually do not pick up interference from transmission lines because corona-generated noise currents are quite small in the FM broadcast frequency band. Additionally, FM radio systems have inherent interference rejection properties that make them virtually immune to corona-noise type disturbances. There would be no impact to FM radio receivers resulting from the project.

5.2.4.2 Mitigation

Route permits from the Commission contain Standard Condition 5.4.3, Interference with Communication Devices, that states:

> 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 Commerce or Commission staff.

The draft Route Permit (**Appendix C**) also includes Special Condition 6.1, Proximity to Radio Antennas, that states:

> The Permittee shall conduct technical studies to determine the effects of rebuilding and upgrading the transmission line in proximity to the AM 980 KKMS antennas. The study shall be based on final engineering of the transmission structure components' location in space, identify radio signal interference, determine the ability for the antennas to induce a voltage on the transmission line, and propose mitigation for any interference or induced voltage. At least 30 days prior to commencing construction within one-half-mile of the AM 908 KKMS antennas, the Permittee shall submit a compliance filing summarizing the results of the technical studies conducted, its coordination with AM 908 KKMS, and any mitigation incorporated by the

Permittee. Construction in proximity to the AM 908 KKMS antennas shall not be authorized until the special condition has been met.

5.2.5 Land Use and Zoning

Land use planning and zoning are tools used to manage land resources in a way that encourages orderly development and protects the resources and uses that are valued by people living in an area. If transmission lines are routed in areas where they are incompatible with existing or planned land uses, it can restrict land use, landowners and communities from using their land resources in ways they prefer, or affect the efficient, organized use, and development of land.

Though the Commission's route permit supersedes local planning and zoning (see **Section 2: State of Minnesota Regulatory Framework**), the Commission is charged with minimizing land use conflicts when making a route permit decision.[35]

5.2.5.1 Impacts

Impacts to land use are expected to be minimal. The area where the project is located presently has a 69 kV transmission line, and the area consists of residential areas, planned development, and pockets of businesses, public facilities, and city parks. Land cover along the transmission line route is predominantly developed.

Zoning within the project area includes:

- City of Eagan: Public facility, residential, park, planned development, neighborhood business, limited business, and community shopping center. There are two overlay districts: Shoreland, and Cliff Road Commons Special Area.
- City of Burnsville: Residential, mixed use, gateway district, gateway industrial, general business, and conservancy. The project also crosses a shoreland overlay buffer in Burnsville.
- City of Apple Valley: Planned development.

Because the project replaces an existing 69 kV line, the effects of the project on local zoning would be minimal, and no mitigation is proposed.

5.2.6 Noise

Noise is defined as unwanted and objectionable sound. Sound levels are usually measured and expressed in decibels (dB), which are logarithmic units that can be used to conveniently compare wide ranges of sound intensities. The A-weighted decibel (dBA) scale of frequency sensitivity accounts for the sensitivity of the human ear, which is less sensitive to low frequencies, and correlates well with human perceptions of the annoying aspects of noise.

Because the decibel scale is logarithmic, a 70 dBA sound level is approximately twice as loud as a 60 dBA sound level, and four times as loud as a 50 dBA sound level. A noise level change of 3 dBA is considered the lowest perceptible level of change to human hearing. A 5 dBA change in noise level is considered clearly noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness, while a 20 dBA change is considered a dramatic change in loudness.

[35] Minn. Stat. 216E.03 Subd. 7(a)

The Minnesota Pollution Control Agency 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 or [NAC]). MPCA noise standards are provided in **Table 9**. These standards are expressed as a range of permissible dBA over the course of an hour. "L_{10}" is the noise level may be exceeded 10 percent of the time, or six minutes per hour, while "L_{50}" may be exceeded 50 percent of the time, or 30 minutes per hour. Standards vary between daytime and nighttime hours.

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. In wilderness areas, ambient 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 or 60 dBA. Levels around 75 dBA are more common in busy urban areas, and levels up to 85 dBA occur near major freeways and airports. Although people often accept higher levels associated with noisy urban residential and residential commercial zones, high noise levels are considered adverse to public health. Comparative noise levels are shown on **Graphic 6, Comparative Noise Levels**.

Table 9 Noise Area Classifications and Noise Standards

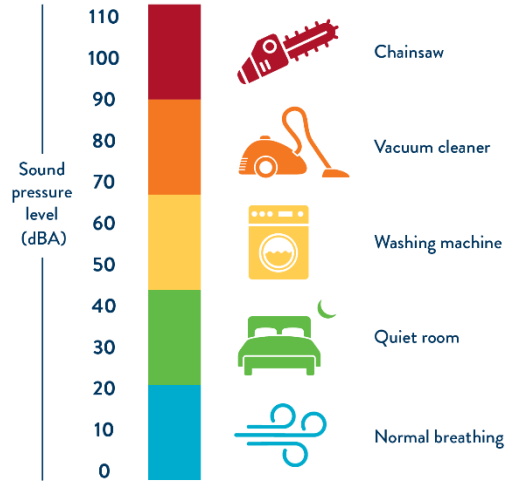
Noise Area Classification	Short Description of Use*	Daytime (7:00 a.m. to 10:00 p.m.)		Nighttime (10:00 p.m. to 7:00 a.m.)	
		L_{10}	L_{50}	L_{10}	L_{50}
1	Residential housing, religious activities, camping and picnicking areas, health services, hotels, educational services	65	60	55	50
2	Retail, business and government services, recreational activities, transit passenger terminals	70	65	70	65
3	Manufacturing, fairgrounds and amusement parks, agricultural and forestry activities	80	75	80	75
4[+]	Undeveloped and unused land	--	--	--	--

Notes:
All numerical standards are presented in dBA
* Full description can be found at https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf
[+] There is no noise standard for NAC 4

5.2.6.1 Impacts

Receptors in the project vicinity include residences, businesses, and churches. Potential noise impacts from the project can be grouped into three categories: construction noise, transmission line noise, and substation noise.

Construction noise is generally expected to occur during daytime hours; however, occasionally, there may be construction outside of those hours or on a weekend if needed to accommodate customer schedules, line outages, or if the construction schedule has been significantly impacted due to delays or other factors. GRE would work with applicable stakeholders in the event construction becomes necessary outside of these hours. Construction activities would be performed with standard heavy equipment such as backhoes, cranes, boom trucks, and assorted small vehicles. Construction equipment noise levels are typically less than 85 dBA at 50 feet when equipment is operating at full load, as shown in **Table 10, Construction Equipment Noise**. Heavy equipment would also be equipped, as required by local ordinances, with sound attenuation devices, such as mufflers, to minimize the daytime noise levels.[36]



Graphic 6 Comparative Noise Levels

Table 10 Construction Equipment Noise

Construction Equipment Description	Noise Level at 50 feet (dBA)
Auger Drill Rig	84
Backhoe	78
Chain Saw	84
Concrete Pump Truck	81
Crane	81
Excavator	81
Flat Bed Truck	74
Man Lift	75
Paver	77
Pickup Truck	75

Source: https://www.fhwa.dot.gov/Environment/noise/construction_noise/handbook/handbook09.cfm
Actual Measured Lmax @ 50 feet (dBA, slow) (Samples Averaged)

At the Burnsville Substation, GRE is proposing to expand the existing substation footprint by approximately 0.06 acre, remove existing bus work, and install new bus work, breakers, and control equipment, and reconfigure the 115 kV transmission entering/exiting the substation. Burnsville Substation is adjacent to the I-35E freeway, and noise impacts to nearby receptors are not anticipated.

[36] Application, p. 7-6

Operational noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually perceivable. As such, noticeable operational noise impacts are not anticipated. Proper design and construction of the transmission line in accordance with industry standards ensures noise impacts do not exceed applicable limits.

Corona is the physical manifestation of energy loss and can transform discharge energy into very small amounts of sound, radio noise, heat, and chemical reactions in the surrounding atmosphere. Transmission lines can generate a small amount of corona activity where a small electrical discharge caused by the localized electric fields near energized components and conductors ionizes the surrounding air molecules. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops can affect a conductor's corona performance.

Noise emissions from a transmission line occur during certain weather conditions. In foggy, damp, or rainy weather, energized conductor can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain.

Corona-induced audible noise and radio and television interference are typically not a concern for power lines with operating voltages below 161 kV, because the electric field intensity is too low to produce significant corona. The project's ultimate operating voltage would be 115 kV. A discussion of the potential effects from electric fields can be found in **Section 5.3.1, Electric and Magnetic Fields**.

Impacts from noise would be temporary in nature during construction, and minimal during operation.

5.2.6.2 Mitigation

Standard language in Commission route permits requires permittees to adhere to MPCA noise standards which protect against impacts human health and welfare.

Mitigation implemented during construction can include:

- Schedule construction to occur during daytime hours;
- If construction is required outside daytime hours, work with applicable stakeholders to minimize impacts; and
- Utilize sound attenuation devices such as mufflers on heavy equipment to minimize the daytime noise levels, as required by local ordinances.

Operational noise from the transmission line is not anticipated to contribute to exceedances of the MPCA's noise standards, therefore, no mitigation is proposed.

5.2.7 Recreation

Recreation includes outdoor leisure activities done for enjoyment, amusement, and pleasure. From hiking, to boating, and nature watching to hunting, transmission lines are a concern for recreation because they can (1) alter recreational resources in a way that diminishes their use or (2) alter the visual

setting in a way that changes the experience and reduces the user's enjoyment, amusement, or pleasure. Both types of impacts tend to occur where the transmission line is located immediately adjacent to the recreational resource.

Northern Dakota County has numerous year-round recreational opportunities such as trails for hiking, biking, and cross-country skiing, lakes and rivers for swimming, boating, and fishing. Existing recreational resources in the project area, including trails, rivers, lakes, fishing sites, and parks are shown on **Figure 2, Recreation in the Project Area**.

5.2.7.1 Impacts

Parks crossed by the transmission line include Highline Trail and Carnelian Park within the City of Eagan, and Terrace Oaks West in the City of Burnsville. Along the majority of the route, there are bike trails, largely associated with bike lanes within roadways, and trails that intersect the transmission line alignment. Bike trails along the transmission line route may need to be temporarily closed while construction takes place in the immediate area. GRE would work with the cities of Eagan and Burnsville to ensure public safety, coordinate temporary closures or reroutes, and notify the public. Impacts to trails during construction would be temporary, localized, and low.

During operation, the 115 kV infrastructure would not preclude recreational activities or appreciably diminish the use or experience at these locations. GRE's existing 69 kV system is presently located along the city parks and bike trails described above. Minimal additional tree clearing or trimming may be required within the existing ROW, and would have minimal and temporary effect to recreational opportunities.

5.2.7.2 Mitigation

GRE may need to temporarily close or reroute access to bike trails along the alignment during construction activities. Great River Energy will work with the cities of Eagan and Burnsville to ensure public safety, coordinate temporary closures or reroutes, and notify the public.[37]

5.2.8 Socioeconomics and Environmental Justice

Socioeconomic factors provide an indication of how economic activity affects and is shaped by social processes. Socioeconomic measures tell us how societies progress, stagnate, or regress because of their local or regional economy, or the global economy.

Environmental justice is the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The goal of this "fair treatment" is not to shift risks among populations, but to identify potential disproportionately high and adverse effects, and identify alternatives that may mitigate these impacts.

Population in Dakota County has increased over the past decade, ranking it as the 10th fastest growing in Minnesota from 2010 to 2022; and has the 3rd largest economy of the 87 counties in the state. Industries with the highest percentage of jobs in the County are retail trade, health care and social assistance, and manufacturing. The construction industry ranked 7th. [38]

[37] Application, p. 7-29

[38] https://mn.gov/deed/assets/021224_dakota_tcm1045-407440.pdf

5.2.8.1 Impacts

Table 11 presents population and economic information gathered from the US Census Bureau 2021 American Community Survey 5-year Estimates about Minnesota, Dakota County, and the 12 census tracts underlying the route width. The full dataset can be found in **Appendix D, Socioeconomics and Environmental Justice Data**.

Table 11 Population, Demographics, and Economic Information in the Project Area

US Census Metric	Minnesota	Dakota County	Project Census Tracts (Aggregated)[39]
Total Population	5,527,358	418,201	49,878
Total Nonwhite Population (%)	23	25	28
Persons at or below 200 percent poverty level (%)	22	14	19
Limited English Speaking Households (%)	2.3	2.9	3.5
Unemployment Rate (%)	2.2	3.1	4.9
Vacant Housing Units (%)	6.6	3.1	3.0
Median Household Income (in 2022 Inflation Adjusted US Dollars)	82,338	97,501	102,969

Minn. Statutes § 216B.1691, Subd. 1(e) defines an environmental justice area in Minnesota as an area in Minnesota that, based on the most recent data published by the United States Census Bureau, meets one or more of the following criteria:

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

Dakota County is not an environmental justice area in the state of Minnesota, nor are the areas of the aggregated census tracts underlying the route width.[40]

Approximately 15 to 25 workers would be required for construction of the transmission line and the work at the Burnsville Substation. GRE expects construction of the project to take approximately two years. There would be minor short-term positive economic impacts as a result of construction activity and an influx of contractor employees during construction of the project. GRE would use contractors for all construction activities. Local businesses would likely experience short-term positive economic impacts through the use of the hotels, restaurants and other services used by contractors during

[39] Census tracts underlying the route width are: 607.14, 607.16, 607.29, 607.31, 607.33, 607.35, 607.38, 607.43, 607.47, 607.50, 607.54, and 608.06.

[40] One census tract (607.43) could be considered an environmental justice area due to its population being greater than 40 percent nonwhite, but the project does not disproportionately affect this tract.

construction. In addition, construction materials may be purchased from local vendors. There would be no permanent positions created as a result of the project.

5.2.8.2 Mitigation

Because impacts to socioeconomics would be generally short-term and beneficial, no mitigation is proposed.

5.2.9 Property Values

One of the primary socioeconomic concerns of those residing near existing or proposed transmission lines is impacts to property values. There are two primary concerns raised regarding the potential impact of a nearby high-voltage transmission line on property value:

- Concern or fear of possible health effects from electric or magnetic fields: While no conclusive evidence of the effects of EMF on health exists, it is recognized that people's concerns about this issue can influence their decisions related to purchase of property.
- The potential noise and visual distinction of the transmission line: The visual profile of transmission lines structures and wires may decrease the perceived aesthetic quality of property. The transmission facility would not generate noise above the state noise standards and is not considered an issue.

In 2010, a literature review examined 17 studies on the relationship between transmission lines and property values. The reviewers concluded that the studies indicate small or no effects on the sale price of properties due to the presence of transmission lines.[41]

5.2.9.1 Impacts

Direct impacts to property values from rebuilding and upgrading the existing 69 kV transmission line to operate at 115 kV are not anticipated. While impacts to property values could occur, any potential impact would be difficult to attribute to the project. No mitigation is proposed.

5.2.10 Public Services and Infrastructure

Public services and infrastructure include the systems that supply essential amenities like public water supplies, electricity, gas, internet, and transportation by road, rail, and air. Construction activities can cause temporary disturbances to public services and emergency response through traffic restrictions or utility outages.

Roadways in northern Dakota County vary from interstate highways to multilane suburban arterials to improved two-land roads with curb and gutter. The cities of Eagan, Burnsville, and Apple Valley provide police, fire, water, and sewer services in their respective cities. Ambulance services are provided by the fire department or private ambulance services.

The Allied Radio Matrix for Emergency Response (ARMER) currently serves as the primary communications tool for the majority of state, county and local public safety entities in Minnesota. The ARMER radio system operates by line of sight, communicating with other ARMER towers. For the system

[41] The Effects of Transmission Lines on Property Values: A Literature Review, Journal of Real Estate Literature, 2010: http://www.real-analytics.com/Transmission%20Lines%20Lit%20Review.pdf

to operate effectively, multiple towers are needed to produce a solid blanket of coverage. The system can be interrupted if tall objects are proposed within the line-of-sight, typically for structures greater than 150 feet tall. There are no ARMER towers within one mile of the project.[42]

There are two airports or airstrips within 5 miles of the project: the Minneapolis-St Paul International Airport, approximately 3.5 miles north of the project; and Crystal Lake, 2.5 miles southwest of the project, has a seaplane base.

5.2.10.1 Impacts

The project would cross an existing Xcel Energy 345 kV transmission line. Three natural gas pipelines are crossed four times by the project.[43] GRE would design the new transmission line to meet or exceed required clearances from other utilities, and no structure locations would be placed on existing utilities. Because the majority of the project would follow the existing 69 kV transmission and road ROW, impacts to existing utilities are anticipated to be minimal.

During scoping, a comment was received from Shannon Marcus regarding electrical service outages that may occur during construction of the project. Electrical service in the area is provided by Dakota Electric Association through its distribution system, and GRE would coordinate the electrical service outages for its system with Dakota Electric Association in order to minimize service impact to customers.

In addition, representatives from Metropolitan Council commented during scoping to be advised there is a sanitary sewer interceptor near the intersection of Cliff Road and Highway 13. If GRE needs to access the area where Metropolitan Council has rights, coordination with Metropolitan Council Environmental Services would be required to obtain an Encroachment Agreement prior to starting construction.

Construction of the transmission line would be primarily within transmission line ROW. Stringing the conductor and shield wire across roads can be accomplished with minimal traffic impacts. Temporary structures may be installed inside or outside of road ROW to ensure pulling lines, shield wire, or conductor has sufficient clearance over roads. All necessary provisions would be made to conform to safety requirements for maintaining the flow of public traffic during construction.

MnDOT provided comments during scoping regarding impacts to its system during construction and operation, and are included in **Appendix E, Correspondence Related to Minnesota Department of Transportation Facilities**. GRE will need to coordinate with MnDOT for use of its right-of-way for transmission structures and overhead wires, protection of environmental resources within the right-of-way, and when planning for oversized loads on the State Highway System. Special Condition 6.2 of the draft Route Permit (**Appendix C**) incorporates these requirements.

Outside the State Highway System on county and local roads, GRE or its contractors would plan and execute delivery of heavy equipment in coordination with the appropriate road authorities and in a manner that would avoid traffic congestion and reduce likelihood of dangerous situations along local roadways. To ensure that any short-term and infrequent traffic impacts are minimized, GRE would

[42] https://dps.mn.gov/divisions/ecn/programs/armer/Documents/Armer%20Site%20Map/ARMER%20Site%20Map%202018-01-01.pdf

[43] Application, Figure 1-1.

coordinate with all affected road authorities and, to the extent practicable, schedule large material and equipment deliveries to avoid periods when traffic volumes are high.[44]

Transmission structures or the cranes used to install the structures have the potential to affect operations at Minneapolis-St Paul International Airport, located approximately 3.5 miles away at the closest point. To ensure the safety of air navigation and the efficient utilization of navigable airspace by aircraft, owners of structures penetrating airspace near airports are required to file notice (FAA Form 7460-1, Notice of Proposed Construction or Alteration) with the FAA. During final engineering of the pole locations and heights, GRE will file notice with the FAA to determine if the potential for an airport obstruction exists. The FAA will determine if additional safety equipment or measures are needed.

Although it is not anticipated that construction activities would result in the blockage of any roadways that could be used in the case of an emergency, GRE would coordinate with local authorities regarding appropriate procedures, signage, and traffic management for lane or road closure. As a result, impacts to emergency response during construction would be minimal.

5.2.10.2 Mitigation

GRE can mitigate the effects of the project to public services and infrastructure by taking the following actions:

- Coordinating electrical service outages with Dakota Electric Association to minimize service impact to customers;
- If there are potential conflicts with the sewer interceptor near the intersection of Cliff Rd and Highway 13, coordinating with Metropolitan Council Environmental Services to obtain an Encroachment Agreement prior to the start of construction;
- Coordination with road authorities for transporting oversize loads;
- Scheduling equipment deliveries to avoid peak traffic;
- Submitting final pole locations and heights to the FAA using Form 7460-1, Notice of Proposed Construction or Alteration, for their analysis of airspace obstruction; and
- Coordinating lane or road closures with local jurisdiction and emergency services.

In addition, Special Condition 6.2 has been included in the draft Route Permit (**Appendix C**) to mitigate effects to the State Highway System that could potentially result from the project. This condition requires that GRE:

- Understand and follow MnDOT's policies, manuals, and guidance documents;
- Maintain MnDOT clearance requirements and clear zones;
- Accommodate active transportation and pedestrian facilities;
- Give MnDOT specialists opportunity to participate in pre-construction meetings related to MnDOT facilities; and
- Coordinate with MnDOT for transportation of oversize loads.

[44] Application, p. 7-16

Implementation of Special Condition 6.2 would reduce project impacts to the State Highway System.

5.2.11 Hazardous Materials

Construction projects typically use hazardous materials for equipment fueling, degreasers, solvents, and lubricants. Hazardous materials, if not properly handled, have the potential to contaminate surface or groundwater, primarily during construction, when several pieces of equipment are in daily use.

5.2.11.1 Impacts

Typical construction activities like those proposed for the project utilize hazardous materials such as fuels, hydraulic oil, lubricants, and cleaning solvents. These materials have the potential to spill or leak from equipment; however, the low volume of hazardous materials that would be used during construction make it unlikely that soil or groundwater would be significantly affected by construction activities. The most likely incidents involving these hazardous materials are associated with minor spills or drips from vehicles or equipment. Impacts from such incidents would be avoided by thoroughly cleaning up minor spills as soon as they occur, and cleanup materials disposed of through a facility licensed to handle the waste.

There is a potential for existing contaminated soil or groundwater to be encountered during drilling to install the new transmission poles. A desktop review of MPCA's What's in My Neighborhood within the project vicinity yielded one site open under MPCA's jurisdiction with the potential to affect construction activities; however, the site has delineated the extent of soil and groundwater contamination, and it does not intersect the proposed transmission ROW. There is a potential that legacy sites in the area may have land use covenants requiring coordination with MPCA prior to disturbing soil. GRE would access information in these covenants during its upgrades to land use rights prior to constructing the project. As a result, the potential to encounter unanticipated contaminated soil or groundwater during construction is low. Other factors associated with encountering groundwater or the protection of groundwater are analyzed in **Section 5.6.4, Geology and Groundwater**.

5.2.11.2 Mitigation

The Commission's Route Permit includes Standard Condition 5.3.19, Pollution and Hazardous Wastes, to reduce the potential for the project to pollute the environment through the Permittee taking the following actions:

- Taking appropriate precautions and complying with laws applicable to the generation, storage, transportation, clean up, and disposal of all wastes generated during construction and restoration.

Although a stormwater pollution prevention plan may not be required for the project, GRE could mitigate potential effects due to the use and handling of hazardous materials by incorporating hazardous material best management practices typically found in stormwater permit documents into its construction plans, such as:

- Providing designated locations and employing protective measures for storage of hazardous materials during construction;
- Establishing on-site notification protocol and response for encountering contaminated soil or groundwater; and

- Establishing spill and cleanup requirements for any incidental spills or other potential releases of hazardous materials.

5.3 Public Health and Safety

Impacts to human health and safety are assessed by looking at three main issues: electric and magnetic fields (EMF), stray voltage, and induced voltage.

The extent to which a project may raise concerns regarding EMF is correlated with the voltage class of the line and how close the route is to human settlement areas. The sections that follow evaluate how the project may impact human health and safety and how these impacts may be mitigated.

5.3.1 Electric and Magnetic Fields

Electric and magnetic fields (EMF) are invisible forces that result from the presence of electricity. EMF occurs naturally and is caused by weather or the geomagnetic field. Human-made EMF is caused by all electrical devices and is found wherever people use electricity. Both electric field and magnetic field strength decrease rapidly as the distance from the source increases.

Electric fields are created by the electric charge (i.e., voltage) on a conductor, and are easily shielded or weakened by most objects and materials, such as trees and buildings. There is a potential for interference with implantable electromechanical medical devices, such as pacemakers, because a high level electric field strength may interfere with a pacemaker's ability to sense normal electrical activity in the heart, causing temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker returns to its normal operation when the person moves away from the source of the interference. Modern "bipolar" cardiac devices are much less susceptible to interactions with electric fields. Manufacturers these types of devices have indicated that electric fields below 6 kilovolts per meter (kV/m)[45] are unlikely to cause interactions affecting operation of most of their devices. In the case of transmission lines, electric field strength is well below the levels that cause such interference.

Magnetic fields are created by the electrical current (i.e., amps) moving through a conductor. Unlike electric fields, magnetic fields are not easily shielded or weakened by objects or materials. Concerns have been raised about the potential for adverse health effects due to EMF exposure. Studies in the 1970s found a statistical correlation between childhood leukemia and EMF exposure. After several decades of study, a cause-and-effect relationship has not been established between EMF and health effects.

5.3.1.1 Impacts

There are no federal regulations regarding allowable electric or magnetic fields produced by transmission lines in the United States. In Minnesota, the Commission has adopted a prudent avoidance approach in routing transmission lines. This means avoiding highly populated areas in routing when possible and maximizing the distance from homes (by placing the line across the road instead of in a front yard, for example). Since EMF levels drop off quickly to background levels with increasing distance from the centerline of a transmission line, these avoidance strategies minimize human exposure to EMF created by the transmission line.

In addition to prudent avoidance, the Commission has adopted a maximum electric field under transmission lines in Minnesota to 8.0 kV/m. **Appendix F, Electric and Magnetic Field Estimates**, presents the strengths of the electric fields modeled for the project. The highest modeled electric field

[45] 8.0 kV/m is the Commission's standard for electric fields.

levels associated with the project are anticipated to range from 0.25 to 2.37 kV/m directly under the centerline, well below the Commission's limits.

The Commission has not adopted a standard for magnetic fields. Magnetic field levels associated with some common electric appliances are provided in **Table 12**. Magnetic field strengths for the project are summarized in **Appendix F, Electric and Magnetic Field Estimates,** for power flow at peak loading and at average loading. The maximum magnetic field under expected peak demand conditions is expected to range between 23.45 and 44.9 milligauss (mG) directly under the line. Magnetic field strengths at the edge of ROW during average loading conditions is expected to range from 10 to 22 mG. Because the actual power flow on a transmission line could potentially vary throughout the day depending on electric demand, the actual magnetic field level could also vary widely from hour to hour.

Table 12 Magnetic Fields from Common Electric Appliances (mG) and Distance from Source

Appliance	6 inches	1 foot	2 feet
Hair Dryer	300	1	--
Electric Shaver	100	20	--
Can Opener	600	150	20
Electric Stove	30	8	2
Television	NA	7	2
Portable Heater	100	20	4
Vacuum Cleaner	300	60	10
Copy Machine	90	20	7
Computer	14	5	2

Source: Application, p. 7-21

Impacts to public health and safety resulting from EMF are not expected.

5.3.1.2 Mitigation

Electric and magnetic field strengths can be lowered through implementation of appropriate design measures and techniques, such as:

- Cancellation: The arrangement of transmission line conductors and shield wires to lower electric and magnetic field levels; and
- Distance: Increasing the distance between the transmission line and other conductors or conductive objects. Electric and magnetic field levels decrease rapidly with distance.

5.3.2 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" is a condition that can occur on the electric service entrances to structures from distribution

lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings.

Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses and residences. Transmission lines can, however, induce a current on a distribution circuit that is parallel and immediately under the transmission line. If a landowner has stray voltage concerns on their property, GRE suggests they contact their electric service provider to discuss the situation with technical staff, including the possibility of an on-site investigation. No impacts are expected, and no mitigation is proposed.

5.3.3 Induced Voltage

When an electric field reaches a nearby conductive object, such as a vehicle or a metal fence, it can induce a voltage on the object. The magnitude of this voltage is dependent on many factors, including the object's capacitance, shape, size, orientation and location, resistance with respect to ground, and the weather conditions. If the object is insulated or semi-insulated from the ground and a person touches it, a small current could pass through the person's body to the ground. This might be accompanied by a spark discharge and mild shock, like what occurs when a person walks across a carpet and touches an object or person.

Most shocks from induced current are more of a nuisance than a danger. To ensure the safety of persons in proximity to a transmission line, the NESC requires that any discharge be less than 5 milliamps (mA). In addition, the Commission's electric field limit of 8.0 kV/m is designed to prevent serious hazard from shocks due to induced voltage under transmission lines. Route permits issued by the Commission require that transmission lines be constructed and operated to meet NESC standards and the Commission's electric field limit.

5.3.3.1 Impacts

Impacts due to induced voltage are not anticipated to occur as a result of the operation of the new transmission line. The new transmission line may induce a voltage on insulated metal objects near the transmission line ROW; however, the Commission requires that transmission lines be constructed and operated to meet NESC standards as well as the Commission's own electric field limit of 8.0 kV/m, reducing these impacts. No mitigation is proposed.

5.4 Land-Based Economies

High voltage transmission lines can impact land-based economies such as mining, forestry and agriculture. The extent to which a project may impact these sectors is closely correlated with how much the project would impact lands earmarked and used by these industries.

5.4.1 Agriculture

Transmission lines can affect agriculture by removing land from agricultural production and by impeding the use of certain larger equipment for the cultivation of crops. Although land in northern Dakota County had previously been agricultural use, today it is primarily used for residential and commercial purposes. There would be no impact to agriculture from the project, and no mitigation is proposed.

5.4.2 Tourism

Transmission lines can impact tourism if they affect the overall experiences of visitors, either through aesthetic impacts, noise, traffic, or other effects to the tourist industry. **Aesthetics, noise, and traffic** are discussed in **Sections 5.2.1, 5.2.6, and 5.2.10,** respectively.

Eagan promotes activities for tourists such as sporting events, shopping, dining, and accommodations. Participating hotels offer free shuttles to area destinations such as the Mall of America, Twin Cities Premium Outlets, and Minneapolis-St Paul Airport.[46] Burnsville offers attractions such as outdoor activities at Buck Hill, and performing arts at the Ames Center.[47] In addition, the Minnesota Zoo is located in Apple Valley approximately one mile southeast of the project. Approximately 1.3 million people visit the zoo annually.[48]

5.4.2.1 Impacts

Project activities avoid areas that would be considered local tourist destinations, and the project would not preclude tourism activities, or appreciably diminish experiences at tourist destinations. The project would have minimal impacts on tourism activities and nearby tourist destinations; as such, no mitigation is proposed.

5.4.3 Forestry

The 1995 Sustainable Forest Resources Act (MN Statutes Chapter 89A) established the Minnesota Forest Resources Council, which now consists of 17 people representing a range of forest resource interests. The council facilitates the development and implementation of site-level and landscape-level forest management programs, and advises the governor and federal, state, county, and local governments on sustainable forest resource policies and practices. There are no management plans or reports of forestry resources covering the Twin Cities metro area.[49] As a result, construction and operation of the project would not affect forestry resources.

[46] https://www.exploreminnesota.com/profile/enjoy-eagan/2068
[47] https://burnsvillemn.com/
[48] https://mnzoo.org/
[49] https://mn.gov/frc/

5.4.4 Mining

The project is located in an area mapped having many limestone crushed stone quarries,[50] but there is no mining occurring within the route width. No impacts to mining are anticipated, and no mitigation is proposed.

[50] https://files.dnr.state.mn.us/lands_minerals/mpes_projects/minnesota_mine_sites_and_advanced_minerals_projects_january2016.pdf

5.5 Archeological and Historic Resources

Cultural resources, including archaeological and historic artifacts and features, contribute to the record of human occupation and alteration of the landscape. Archaeological resources include historic and prehistoric artifacts, structural ruins, or earthworks, and are often partially or completely below ground. Historic resources include extant structures, such as buildings and bridges, as well as districts and landscapes. Traditional cultural properties are also considered historic or cultural resources that reflect cultural or religious importance. Reports and correspondence relating to archeological and historic resources are provided in **Appendix G, Reports and Correspondence relating to Archeological and Historic Resources**.

The Cities of Eagan, Burnsville and Apple Valley are the ancestral home to the Mdewankanton band of the Dakota. Specifically, the Black Dog Native American village, named for Chief Black Dog, was located on the shores of the Minnesota River on the northern portions of the present-day cities of Eagan and Burnsville. This community is believed to have moved to this area from the Mille Lacs area around 1750.[51]

Maps from 1870 show the Minnesota River and associated floodplains and wetlands, and Fort Snelling. Aerial photographs from 1940 show the presence of established roads and farmsteads in the area; subsequent historic and modern aerial photographs show that the landscape being heavily developed, and roads and infrastructure expanded extensively since the 1940s.

Blackhawk Lake, approximately one-quarter mile from the project, is mapped as supporting wild rice stands.[52] In addition to attracting many wild birds, especially waterfowl and red-winged blackbirds, wild rice (manoomin) is sacred to the Ojibwe people who live in the Great Lakes region.

5.5.1.1 Impacts

Merjent, Inc., conducted a Phase IA Literature Review within one-half mile on each side of the proposed transmission line alignment. Cultural resources site information (archaeological sites and historic structures) and previous survey files from the SHPO were reviewed, as well as archaeological site files on the Office of the State Architect (OSA) Portal, General Land Office (GLO) maps, and available historical aerial photography were accessed online through the OSA Portal.

GRE requested feedback on the project from the 11 federally recognized tribes with geography within Minnesota and the Minnesota Indian Affairs Council (MIAC) in letters sent in August 2023. GRE received responses from the Shakopee Mdewakanton Sioux Community Tribal Historic Preservation Officer (THPO), requesting:

- GRE provide notification of the project to all the Minnesota Dakota THPOs and the MIAC;
- Complete a desktop study through the OSA web portal or SHPO to identify recorded archeological sites; if any sites are identified directly in the path of the project to choose an alternative route by consulting with tribes;
- Monitor ground disturbing activities in areas determined to be sensitive to tribes; and
- Have an Unanticipated Discovery Plan in place for the project.

[51] Application, p. 7-12

[52] https://mnatlas.org/resources/wild-rice-mn-dnr/

GRE responded that the project notification was provided to all 11 Minnesota THPOs and MIAC, provided a copy of the Phase IA Literature Review; and in October 2023, provided a copy of the Unanticipated Discoveries Plan. Reports and correspondence relating to archeological and historic resources for the project is provided in **Appendix G**.

The archeological and historic properties identified within one-half mile of the alignment and their status in the National Registry of Historic Places (NRHP) are summarized in **Table 13**.

Table 13 Archeological and Historic Properties Identified Within One-half Mile of the Alignment

Site Number/Name	Site Type	Location (Township/Range/ Section)	NRHP Status
DK-BVC-001/ Connelly Farmhouse (razed)	Farmstead	T27N R24W S26	Unevaluated
DK-BVC-002/ Kennelly Farmstead (razed)	Farmstead	T27N R24W S25	Unevaluated
DK-BVC-006	Single Dwelling	T27N R24W S36	Unevaluated
DK-EGC-017/ Eagan Town Hall (moved)	Governmental	T27N R23W S22	Unevaluated
XX-ROD-028/TH 36 (including TH 77)	Road-related	T27N R23W S18 and 19	Unevaluated
St John's Cemetery	Cemetery	T115N R20W S15	Protected under Minn. Stat § 307.08
Christ Lutheran Cemetery	Cemetery	T27N R12W S29	Protected under Minn. Stat § 307.08

According to the OSA and SHPO files, there are no archaeological sites recorded within a half-mile of the proposed alignment. The historic resources listed in **Table 11** and the potential impacts from the project are discussed below.

Five historic buildings and structures are located within one-half mile of the proposed alignment. All of these resources are presently considered unevaluated for the NRHP. The project crosses the historic Cedar Ave / State Highway 77 at its intersection with Cliff Road / County Highway 32. The work in this area would consist of structure replacement along the same alignment as the existing transmission line, and the replacement line would not result in an appreciable change to viewshed, and likely would not impact its eligibility for inclusion in the NRHP.

The Eagan Town Hall was formerly located less than a half mile from the existing transmission line, but it has since been moved approximately 0.65 mile north of the project. Because it is no longer at its original location, it is possible that it is now not eligible for inclusion in the NRHP per criteria consideration B (36 CFR 60.4). Two sites (DK-BVC-001/ Connelly Farmhouse and DK-BVC-002/ Kennelly Farmstead) have

been razed and are no longer extant. Because these sites have been razed, they are no longer eligible for inclusion in the NRHP per criteria consideration B (36 CFR 60.4).

The remaining potentially historic building is a single dwelling located 250 feet east of the project approximately 2 miles north of the Burnsville Substation in the City of Burnsville. This site does not appear to be visible from the ROW due to a wooded area and modern apartment complex. Due to these physical barriers, construction activities would not impact this site. Additionally, because the project is rebuilding and upgrading an existing transmission line, there would not be an appreciable change to viewshed and the eligibility of the site would not be impacted.

Two historic cemeteries were identified within a half-mile of the proposed alignment, both near the intersection of Blackhawk Road and Diffley Road, approximately 0.75 and 2.5 miles from the Deerwood and River Hills substations, respectively, in the City of Eagan. One cemetery, St. John's Cemetery, is potentially affected by the project. At this location, the replacement line would generally follow the alignment of the existing line; therefore, a pole may be located immediately northeast of St. John's Cemetery. Some tree clearing would likely be required within the cemetery boundaries. Given the close proximity to the cemetery, Merjent recommended a qualified archaeologist monitor construction activity at this pole location in its August 8, 2023, letter to the SHPO.

The Christ Lutheran Cemetery is located at the intersection of Diffley Road and Beaver Dam Road, approximately 0.2 miles west of Blackhawk Road. Aerial images show a cemetery plot immediately south of Christ Lutheran Church, bordered by trees on the east, south, and west. Several roads, buildings, and a small lake would provide a buffer between the project and the cemetery, limiting direct impacts to the cemetery.

This literature review and Merjent's evaluation of the possible effects of the project on archaeological and historic properties in the search area and proposed mitigation was provided to the Minnesota SHPO in a letter dated August 8, 2023. The SHPO response to the letter was received on September 25, 2023, indicating that there are no known properties at this time listed in the National or State Registers of Historic Places and no known or suspected archaeological properties in the area that would be affected by the project.

5.5.1.2 Mitigation

Standard condition Section 5.3.15 in the draft Route Permit (**Appendix C**) applies to protection of archeological and historic resources. It requires the Permittee to:

- Avoid impacts to archeological and historic resources where possible and to mitigate impacts where avoidance is not possible.
- 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 previously unidentified archaeological sites are found during construction, to stop construction and contact SHPO and the State Archaeologist to determine how best to proceed.
- If human remains are discovered, to stop ground disturbing activity and notify local law enforcement.

Additionally, GRE has indicated it will be implementing two mitigation measures as part of this project:[53]

- A qualified archaeologist will monitor construction activity at the pole location northeast of St. John's Cemetery; and
- Implement an Unanticipated Discoveries Plan.

[53] Application, p. 7-33

5.6 Natural Resources

Impacts to the natural environment are assessed by looking at a variety of resources including air quality, geology and soils, water resources, flora, fauna, and rare and unique resources. Impacts of a transmission line project on these resources are associated with construction directly across or through a resource area. For example, water resource impacts primarily occur where the route requires a wetland or waterbody crossing. In some cases, however, routing in close proximity, even without a crossing, can affect natural resources. Wildlife near the construction area, for example, may be disturbed by noise from construction equipment.

The project would primarily be located within existing ROW. The sections that follow evaluate how the project may impact natural resources and how these impacts may be mitigated.

5.6.1 Air Quality

Air quality is a measure of how pollution-free the ambient air is and how healthy it is for humans, other animals, and plants. Emissions of air pollutants during construction and operation of new infrastructure can cause concern about degradation of air quality. Overall air quality in Minnesota has improved over the last 20 years, but current levels of air pollution still contribute to health impacts.[54]

There are three air quality monitoring stations in northern Dakota County: Lakeville (approximately 4 miles to the south); Apple Valley (approximately 1.5 miles to the south); and Eagan (approximately 3 miles to the northeast). These stations, in various capacities, monitor for:

- Carbon monoxide (CO): a common combustion byproduct;
- Lead: common sources include metals processing facilities;
- Nitrogen dioxide (NO2): a common combustion byproduct;
- Particulate matter less than 2.5 microns (PM2.5): typically result from chemical reactions from pollutants emitted from power plants, industry, and automobiles; and
- Total Suspended Particles (TSP).[55]

Appendix H provides air quality monitoring results from the air quality monitoring sites in northern Dakota County. For the past three reported years, CO concentrations have been more than 90 percent below the standard, both lead and NO2 concentrations have been more than 60 percent below the standard, and particulate matter concentrations have been more than 40 percent below the standard.

5.6.1.1 Impacts

Impacts on air quality from construction and operation of the project would be low and primarily limited to the period of construction. During construction, air emissions would occur from the operation of construction equipment, vehicular traffic, and soil disturbance. Construction activities would be performed with standard heavy equipment such as cranes, boom trucks, and assorted small vehicles. Emissions from these vehicles and activities would not substantially affect the concentrations of air quality constituents being monitored in northern Dakota County. During operation, the annual

[54] The State of Minnesota's Air Quality, January 2023 Report to the Legislature, https://www.pca.state.mn.us/sites/default/files/lraq1sy23.pdf.

[55] https://www.epa.gov/environmental-topics/air-topics

inspections, maintenance, and emergency repair of the transmission line also would not substantially add to air quality pollutant concentrations in the region.

When necessary, dust from construction activities would be controlled using standard construction practices such as watering of exposed surfaces, covering of disturbed areas, reduced speed limits, and the use of chemical dust suppressants. Dust suppressants containing chloride can be damaging to wildlife, as discussed in **Section 5.6.8, Wildlife**.

5.6.1.2 Mitigation

Impacts to air quality can be mitigated by the following measures:

- Exhaust emissions can be minimized by keeping vehicles and equipment in good working order, and not running equipment unless necessary.
- Reduced speed on unpaved roads.
- Minimize tracking of soil onto paved roads by the use of matting at access points; and sweeping streets if soil is tracked onto paved roads.

Additional requirements regarding the use of dust suppressants can be found in Special Condition 6.5, Dust Control, discussed in **Section 5.6.8, Wildlife**.

5.6.2 Greenhouse Gases

Greenhouse gases (GHGs) are gaseous emissions that trap heat in the atmosphere and contribute to climate change. These emissions occur from natural processes and human activities. The most common GHGs emitted from human activities include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N_2O). Greenhouse gas emissions are typically reported in carbon dioxide equivalents (CO2e) to account for the variation of global warming potential (GWP) of different gases to produce warming effects. As an example, CH4 is 27 times more potent than CO2 as a greenhouse gas, and N_2O is 273 times more potent than CO2 as a greenhouse gas.[56]

In 2007, Minnesota passed the Next Generation Energy Act, which set statutory goals to reduce GHG emissions by 80 percent between 2005 and 2050.[57] Minnesota's GHG emissions declined 23 percent between 2005 and 2020.[58]

5.6.2.1 Impacts

Construction of the project would result in GHG emissions from the combustion of diesel and gasoline in heavy construction equipment, delivery vehicles, and worker passenger vehicles. Construction activities are expected to produce a total of 1,140 tons CO2e.[59] GHG emissions from construction vehicles would be minimized by keeping construction equipment in good working order. Upon completion of the construction activities, emissions from heavy equipment, delivery vehicles, and construction personnel would cease.

[56] https://www.epa.gov/ghgemissions/understanding-global-warming-potentials
[57] Minn. Stat. § 216H.02
[58] https://www.pca.state.mn.us/sites/default/files/lraq-2sy23.pdf
[59] Application, Appendix G

During the operational stage, transmission lines would be regularly inspected, maintained, and possibly undergo emergency repair. These activities would generate a minor amount of GHG emissions. It is estimated approximately 1.7 tons per year (tpy) CO2e would be generated during operation.

Sulfur hexafluoride (SF6), a GHG with a global warming potential 23,500 times that of CO2, is used at the substations associated with the project, and would continue to be used when the 69 kV system is energized at 115 kV. SF6 is a gas used in high voltage circuit breakers to extinguish arcs formed when the circuit breaker opens. Small releases occur as part of regular breaker operation and maintenance. Companies purchasing more than 10,000 metric tons CO2e of any one high GWP gas annually must report purchases of all high GWP chemicals to the MPCA.[60]

Currently, there are no Minnesota-specific thresholds of significance for determining impacts of GHG emissions from an individual project on global climate change. In the absence of such a threshold, state regulations establish 100,000 tpy as the threshold to prepare an Environmental Assessment Worksheet to aid in determining if potential significant environmental effects might exist. Projects with GHG emissions below 100,000 tpy likely do not have the potential to result in significant GHG emissions. The project would have minimal effect to GHG emissions in Minnesota, and as such, no mitigation is proposed.

5.6.3 Climate Change

Climate change refers to long-term shifts in temperatures and weather patterns. Such shifts can be natural, due to changes in the sun's activity or large volcanic eruptions. But since the 1800s, human activities have been the main driver of climate change, primarily due to the burning of fossil fuels like coal, oil and gas.[61]

The MDNR publishes historical climate data from the years 1895 to 2024.[62] This data shows that the average temperature of Dakota County, Minnesota has been increasing at a rate of 0.17 °F per decade to reach an annual average temperature of 47.97 °F in 2023. Similarly, the annual precipitation in Dakota County has increased at a rate of 0.36 inches per decade since records have been kept; in 2023, there was 31.98 inches of precipitation.

The frequency and intensity of heavy rainfall is increasing across the state. The MDNR climate office has defined mega-rain events as rainfalls of more than 6 inches over 1,000 square miles in 24 hours or less.[63] Sixteen mega-rain events have been recorded in the past 50 years. Of these, 11 events have occurred in the past 25 years. Over the next 30 years, Dakota County is predicted to have moderate risk of flooding.[64] For the present water year, Dakota County is experiencing a period of moderate drought.[65]

Since 2014, average wind speed at the Minneapolis St Paul International Airport weather station has decreased by 0.4 miles per hour. Over the same time period, the maximum peak wind gust speed has also decreased by 1.4 miles per hour.[66]

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[60] https://www.pca.state.mn.us/business-with-us/high-global-warming-potential-greenhouse-gases
[61] https://www.un.org/en/climatechange/what-is-climate-change
[62] https://arcgis.dnr.state.mn.us/ewr/climatetrends/
[63] https://www.dnr.state.mn.us/climate/summaries_and_publications/mega_rain_events.html
[64] https://riskfactor.com/county/dakota-county-mn/27037_fsid/flood
[65] https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?fips_27037
[66] https://www.ncei.noaa.gov/

5.6.3.1 Impacts

A warming climate is expected to cause increased flooding, storms, and heat wave events. These events, especially an increased number and intensity of storms, could increase risks to the project, e.g., high winds or flooding could impact the transmission components. Heavy rainfall events could also lead to increased soil erosion. The project is a rebuild and upgrade to an existing transmission line, and would increase electrical service reliability in the area. GRE is assessing risks to the reliable operation of its entire transmission system from the potential impacts of climate change, and is working on opportunities to mitigate those risks; the project components would be designed to withstand identified climate change-related event risks.[67] No mitigation is proposed.

5.6.4 Geology and Groundwater

Geology is the study of the structure, evolution and dynamics of the Earth and its natural mineral and energy resources. Geology is important for the exploration of minerals, understanding the stability of the subsurface, evaluating water resources, and the remediation of environmental hazards. Geological and hydrological systems often determine land use choices and is a factor in siting infrastructure.

The surface topography in the project area was heavily influenced by the most recent glaciation. The region is topographically lower in comparison to other areas in Minnesota, and it is dominated by a large moraine and areas of outwash plain deposits. Topography is rolling to hummocky on the moraine (steep, short complex slopes) and level to rolling on the outwash. Glacial drift is generally less than 100 feet thick within the region. Ordovician- and Devonian-age dolomite (and some limestone, sandstone, and shale) is locally exposed in some stream valleys in the region.[68]

Groundwater is water that exists beneath the land surface. Groundwater is the source of about 37 percent of the water that county and city water departments supply to households and businesses. It also provides drinking water for more than 90 percent of the rural population who do not get their water delivered to them from a county or city water department or private water company.[69] Minnesota is divided into six groundwater provinces based on bedrock and glacial geology. The project is located in Province 1 (East-central), which is characterized by buried sand aquifers. The upper unconsolidated aquifers are underlain by sedimentary bedrock with good aquifer properties.[70]

Groundwater resources are protected by the Safe Drinking Water Act through US Environmental Protection Agency (USEPA)-designated sole source aquifers (SSA), and through the local identification and administration of Wellhead Protection Areas (WHPAs). The USEPA defines a SSA or principal source aquifer area as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer, where contamination of the aquifer could create a significant hazard to public health, and where there are no alternative water sources that could reasonably be expected to replace the water supplied by the aquifer. There are currently no USEPA-designated SSAs in the project area. [71]

WHPAs for public and community water-supply wells are delineated based on a zone of capture for 10-year groundwater time-of-travel to the well and are available through a database and mapping layer

[67] Application, p. 7-27
[68] https://www.dnr.state.mn.us/ecs/index.html
[69] https://www.usgs.gov/faqs/what-groundwater.
[70] https://www.dnr.state.mn.us/waters/groundwater_section/mapping/provinces.html
[71] https://www.epa.gov/dwssa

maintained by Minnesota Department of Health. There are two wellhead protection areas underlying the project's route width: Eagan South (from Pilot Knob Substation north 0.85 miles to Deerwood Drive); and Burnsville (from County Highway 13 south 2.2 miles to Burnsville Substation). [72] Potential contaminant sources being monitored near the public water supply wells include the following:

- Sanitary sewer components, such as sewage sumps, buried sewer lines, sewage seepage pits, and sewage holding tanks;
- Direct sources, such as scrap yards, floor drains, grates, troughs, petroleum storage tanks, surface water and flooding potential, and swimming pools;
- Stormwater infrastructure, such as storm water drain pipe, storm water basins, gravel pockets, and french drains; and
- Wells, such as monitoring wells and extraction wells.

5.6.4.1 Impacts

Impacts associated with geology and groundwater are typically associated with unstable rock formations, dewatering during construction, improper installation or abandonment of wells, or the introduction of a source of pollutants to an area identified for the protection of groundwater.

GRE anticipates direct-embedded transmission poles would be installed by augering a hole typically 10 to 20 feet deep and three to five feet in diameter for each pole. Concrete foundations may be required for large angles, long spans, or interstate highway crossings. Where used, concrete foundations are typically five to eight feet in diameter and 15 to 45 feet deep with one foot exposed above the existing ground level, and the pole mounted on top.

Eighty-five percent of the route width is mapped as having depth to groundwater at less than 20 feet. [73] If dewatering is necessary above 10,000 gallons per day or 1 million gallons per year, GRE would be required to obtain a Water Appropriation Permit from MDNR. [74] If displaced groundwater rises to the surface during pole or foundation installation, GRE would collect the groundwater and dispose of it through a licensed facility. [75] No groundwater is anticipated to be discharged during construction to a storm drain or to surface water without a permit.

The Minnesota Department of Health provided comments on August 29, 2023, to GRE during their initial outreach period for the project, and is included in **Appendix I, Correspondence related to Wellhead Protection**. To mitigate the potential impacts associated with introducing groundwater contamination in the event of a spill, or the potential for the project to limit owners' access to their wells in order to properly maintain and seal wells, MDH proposed mitigation measures regarding staging of equipment, emergency response plans, preparing a contact list of well owners for notification in case of a spill, and maintaining clearance from existing wells to allow owners to access the wells with a drill rig without special equipment or de-energizing the line. These measures have been included as Special Condition 6.3 in the draft Route Permit (**Appendix C**).

[72] https://gisdata.mn.gov/dataset/water-wellhead-protection-areas
[73] https://mnatlas.org/resources/water-table-depth/
[74] MDNR may also have additional requirements due to the project's proximity to calcareous fens. See Section 5.6.9, Rare and Unique Resources.
[75] Communication, July 3, 2024, GRE to Department of Commerce

Implementation of the mitigation measures listed below would reduce the project's potential adverse effects to geology and groundwater.

5.6.4.2 Mitigation

To reduce the project's effects to geology and groundwater, **Special Condition 6.3** has been included in the draft Route Permit (**Appendix C**) and is summarized as follows:

- Project staging shall occur 200 feet from city wells;
- Follow the Emergency Response Plans for the cities of Burnsville and Eagan in case of a spill;
- Prepare a contact list of well owners for wells located within 200 feet of the transmission line and provide to MDH for notification in the event of a spill or release of hazardous substance; and
- Locate the transmission lines a sufficient distance from existing wells to allow safe and legal access for maintenance, service, or sealing with a drill rig, or provide accommodation to well owners. This accommodation could include relocation of the well to provide similar chemistry and supply to the owner, and properly abandoning the impacted well.

Additional measures to reduce the project's potential to introduce contamination into the soil and groundwater can be found in **Section 5.2.11, Hazardous Materials**, and additional measures to reduce the project's effects to surface water can be found in **Section 5.6.6, Surface Water Resources**.

5.6.5 Soils

Soil is a mix of living and non-living material. Soil health is defined as "the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans." Healthy soil provides a multitude of benefits: clean air and water, bountiful crops and forests, productive grazing lands, diverse wildlife, and beautiful landscapes. Soil performs five essential functions:

- Regulating water
- Sustaining plant and animal life
- Filtering and buffering potential pollutants
- Nutrient cycling
- Providing physical stability and support

The soil in northern Dakota County was glacially-formed, primarily consisting of loams and sands, and prior to European settlement, it supported oak and aspen savanna, tallgrass prairie, and maple-basswood forest. Much of the surface soil in the project area has been modified, developed upon, graded, and landscaped.

5.6.5.1 Impacts

Potential impacts of construction are compaction or rutting of soil associated with construction equipment, and exposing disturbed soils to wind and water erosion. Ground disturbance and soil exposure would be primarily limited to the pole locations, at which activities would typically consist of augering a hole 10 to 20 feet deep and three to five feet in diameter for each pole. Soil not re-used would be thin spread in the construction area, or hauled off-site.

Erosion and sediment control methods would be utilized to minimize runoff during construction. Such best management practices may include but are not limited to the installation of sediment barriers (e.g., straw bales, bio-logs), filter socks, mulch, upslope diversions, and slope breakers. Soils in the construction areas would be decompacted, if necessary, and revegetated as soon as possible to minimize erosion. GRE prepared a draft Vegetation Management Plan for this project,[76] and it will be reviewed for consistency with the approved Route Permit prior to construction. Standard conditions in the draft Route Permit (**Appendix C**) includes provisions for erosion and sediment control, and for vegetation management. Some erosion and sediment control products can be damaging to wildlife. The potential for these effects to occur are analyzed in **Section 5.6.8, Wildlife**.

Implementation of these measures would reduce impacts to soil resulting from construction of the project.

5.6.5.2 Mitigation

The implementation of two standard conditions in the draft Route Permit (**Appendix C**) would reduce the potential impacts to soils; these conditions are summarized below:

Section 5.3.8, Soil Erosion and Sediment Control

- Implement erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency Construction Stormwater Program;
- Obtain a National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit from the Minnesota Pollution Control Agency when required, and implement the conditions therein;
- Protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, and stabilizing slopes;
- Grade contours as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that facilitate re-vegetation and prevent erosion; and
- Return all areas disturbed during construction to pre-construction conditions.

Section 5.3.10, Vegetation Management

- Minimize the number of trees to be removed; and
- Preserve windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings.

Additional measures related to the potential for sediment and erosion control products to negatively affect wildlife can be found in **Section 5.6.8, Wildlife**.

[76] Application, Appendix I

5.6.6 Surface Water Resources

Surface water resources include surface water bodies, water courses, and wetlands that supply water for drinking, irrigation and industrial uses, provide wildlife habitat, and serve as swimming and fishing resources for people. The extent of surface water resources (their amount and distribution) and their condition (physical, chemical, and biological attributes) are critical to ecosystems, human uses, and the overall function and sustainability of the hydrologic cycle. Calcareous fens, a particularly rare type of wetland, is discussed in **Section 5.6.9, Rare and Unique Resources**. The potential for soil and groundwater to enter surface water bodies is analyzed in **Section 5.6.4, Geology and Groundwater**, and **Section 5.6.5, Soils**.

The project is situated within the Lower Minnesota River and Vermillion River watersheds. Prior to European settlement, tall grass and wet prairies stretched across the western watershed while the eastern portions supported an immense 'Big Woods' of oak, maple, basswood and hickory rose from the landscape. Today, few features in the present landscape have remained unaltered by past agriculture and more recent urban development. Intensive wetland drainage and plowing of native prairies and forestlands gave rise to the western and southern regions agricultural economies. The Twin Cities metropolitan area continues to move further into the watersheds as greater demand for housing and development results from a growing population. Remaining natural features in the project area are primarily limited to protected areas that provide habitat to wildlife.[77]

Surface water from the project area primarily drains toward Carlson Lake (northeast of Pilot Knob Substation), Blackhawk Lake (northern portion of Pilot Knob-Deerwood segment), and Alimagnet Lake (south of Burnsville Substation). These drainage basins have been identified by the State of Minnesota as being impaired waters, meaning the water quality does not meet the standards needed for its designated use. Impairments and designated uses are presented in **Table 14**.[78]

Table 14 Waterbody Impairments and Designated Uses

Waterbody	Designated Use	Impairment
Carlson Lake	Aquatic recreation	Nutrients
Blackhawk Lake	Aquatic consumption	Mercury in fish tissue
Alimagnet Lake	Aquatic recreation	Nutrients

Adjacent to many waterbodies are riparian areas and wetlands. Protection of existing wetlands is important for flood control and filtering of stormwater runoff, and water quality remains a significant concern throughout the region.[79] Wetlands that are hydrologically connected to the nation's navigable rivers are federally protected under the Clean Water Act. In Minnesota, wetlands are also protected under the Wetland Conservation Act.

[77] https://www.pca.state.mn.us/sites/default/files/wq-ws3-07020012b.pdf; https://www.pca.state.mn.us/sites/default/files/wq-ws3-07040001b.pdf
[78] https://www.pca.state.mn.us/air-water-land-climate/minnesotas-impaired-waters-list
[79] https://files.dnr.state.mn.us/assistance/nrplanning/bigpicture/cwcs/profiles/st_paul_baldwin_plains.pdf

A floodplain is any area subject to flooding from any source, such as rivers, streams, and lakes.[80] Natural floodplains provide flood risk reduction benefits by slowing runoff and storing flood water. Floodplains not only play a vital role in spawning habitat and refuge for aquatic biota, but also for nutrient removal and energy dissipation for river stability.

5.6.6.1 Impacts

Impacts to surface water resources typically include pollutants entering wetlands and waterbodies from stormwater runoff containing chemicals released onto urban hardscape, used in landscaping, or an excess of sediment from soil erosion. Developing floodplains or siting infrastructure in floodplains can present problems if flooding occurs, damaging infrastructure, homes, and businesses.

At this time, GRE anticipates the project would disturb less than an acre of soil, and would not be required to obtain a National Pollutant Discharge Elimination System permit from the MPCA to discharge stormwater from construction areas. The disturbed area calculation would be based on final engineering of the project. However, erosion and sediment control requirements are included as standard conditions in the Commission's Route Permit, and implementation of these conditions would reduce the effects to surface water quality from ground disturbing activity during construction.

Some erosion and sediment control products have the potential to negatively affect surface water quality. Some hydro-mulch products contain small synthetic (plastic) fibers to aid in its matrix strength. These loose fibers could potentially re-suspend and make their way into waterways, and degrade water quality. Special Condition 6.4 has been added to the draft Route Permit (**Appendix C**) to address the potential for revegetation products to negatively affect water quality.

The project also has the potential to contribute pollutants to impaired waters. The Vegetation Management Plan (VMP) prepared for the project does not include the use of fertilizers or other sources of nutrients as part of vegetation establishment or management within the ROW.[81] However, GRE would be obtaining rights to utilize property for utility purposes only, and the underlying property owner may elect to use fertilizers on their property, independent of GRE's transmission line construction or operation, and may also request GRE use fertilizers during revegetation after construction. The small quantity of fertilizer potentially used is unlikely to affect water quality in the impaired waterbodies.

Wetlands

A jurisdictional delineation has not been conducted for the project; however, the MDNR has mapped 101 wetlands, 121 freshwater ponds, and two lakes within the project vicinity.[82] These are shown on **Figure 3, Surface Water Resources in Project Vicinity**. Focusing on the route width, 11 freshwater ponds and 13 wetlands have been mapped within the route width; these wetlands and waterbodies mapped within the route width are summarized in **Table 15**.

[80] https://floodsciencecenter.org/products/elected-officials-flood-risk-guide/introduction/.
[81] Application, Appendix I
[82] https://mnatlas.org/resources/wetlands-nwi-plant-community/

Table 15 Summary of Wetlands and Waterbodies Mapped within the Route Width

Classification	Wetland Type	Acres	Simplified Plant Community Classification
PUBHx	Freshwater Pond	4.3	Non-Vegetated Aquatic Community
PUBHx	Freshwater Pond	3.3	Non-Vegetated Aquatic Community
PUBHx	Freshwater Pond	2.1	Non-Vegetated Aquatic Community
PEM1F	Freshwater Emergent Wetland	1.2	Shallow Marsh
PUBH	Freshwater Pond	0.85	Non-Vegetated Aquatic Community
PFO1A	Freshwater Forested Wetland	0.64	Hardwood Wetland
PABH	Freshwater Pond	0.55	Shallow Open Water Community
PFO1A	Freshwater Forested Wetland	0.48	Hardwood Wetland
PUBHx	Freshwater Pond	0.46	Non-Vegetated Aquatic Community
PEM1C	Freshwater Emergent Wetland	0.42	Shallow Marsh
PEM1C	Freshwater Emergent Wetland	0.36	Shallow Marsh
PEM1C	Freshwater Emergent Wetland	0.30	Shallow Marsh
PABH	Freshwater Pond	0.26	Shallow Open Water Community
PEM1A	Freshwater Emergent Wetland	0.22	Seasonally Flooded/Saturated Emergent Wetland
PEM1C	Freshwater Emergent Wetland	0.20	Shallow Marsh
PEM1A	Freshwater Emergent Wetland	0.19	Seasonally Flooded/Saturated Emergent Wetland
PEM1A	Freshwater Emergent Wetland	0.17	Seasonally Flooded/Saturated Emergent Wetland
PEM1A	Freshwater Emergent Wetland	0.16	Seasonally Flooded/Saturated Emergent Wetland
PEM1C	Freshwater Emergent Wetland	0.14	Shallow Marsh
PUBF	Freshwater Pond	0.11	Non-Vegetated Aquatic Community
PUBHx	Freshwater Pond	0.10	Non-Vegetated Aquatic Community
PUBHx	Freshwater Pond	0.08	Non-Vegetated Aquatic Community
PUBHx	Freshwater Pond	0.06	Non-Vegetated Aquatic Community
PEM1C	Freshwater Emergent Wetland	0.06	Shallow Marsh

Wetlands would be impacted by the construction and operation of the project. GRE would manage the ROW to remove vegetation that interferes with the operation and maintenance of the transmission line. Existing trees would be removed throughout the entire ROW, including those within forested wetlands.

Therefore, these forested wetlands would undergo permanent conversion to a different wetland vegetation community type within the ROW. GRE would seek coverage under USACE's Utility Regional General Permit once design of the project is complete. GRE does not anticipate placing poles within wetlands or waterbodies at this time.

The footprint of the project crosses areas of minimal flood hazard; [83] as a result, the project would not impact flood planning or development in the area.

Implementation of the mitigation measures listed below would result in a lower impact to surface water resulting from construction and operation of the project.

5.6.6.2 Mitigation

Standard Condition 5.3.9 in the draft Route Permit (**Appendix C**) include requirements for minimizing impacts to wetlands, summarized as follows:

- Construction in wetland areas occur during frozen ground conditions to minimize impacts; if construction is not possible during winter, wooden or composite mats will be used to protect wetland vegetation; and
- Soil excavated from the wetlands and riparian areas be contained and managed in accordance with all applicable wetland permits.

5.6.7 Vegetation

Construction of transmission lines often requires the disturbance or removal of vegetation during construction. Additionally, vegetation may be impacted if invasive or non-native species are introduced to the ROW during construction or restoration, or by changes to habitat (e.g., soils, water flows) that adversely impact plant growth.

Northern Dakota County is largely developed with commercial and residential development. Vegetation typically associated with ornamental and manicured landscaping is predominant in the area. There are some stands of trees in undeveloped areas.

5.6.7.1 Impacts

Construction and operation of the project may cause short-term and long-term impacts on vegetation.

During construction, vegetation may be impacted if invasive or non-native species are introduced into the ROW during construction or restoration, or by changes in soil or stormwater runoff that adversely impacts plant growth. Standard conditions are included in the draft Route Permit (**Appendix C**) to reduce impacts associated with invasive species and noxious weeds.

Long-term impacts would primarily result from tree trimming and removal in the ROW. GRE anticipates approximately 9.5 acres of trees would be removed within the 70 foot ROW for the project. Maintenance of the ROW must meet electrical safety standards, therefore woody vegetation that is removed from the ROW is unlikely to be replaced. The draft Route Permit (**Appendix C**) includes a standard condition to minimize tree removal.

[83] https://mnatlas.org/resources/fema-dfirm-hazard-zones/

Compliance with the Route Permit would minimize short- and long-term impacts to vegetation resulting from the project.

5.6.7.2 Mitigation

The implementation of three standard conditions in the draft Route Permit (**Appendix C**) would reduce the potential impacts to vegetation, and are summarized below:

Section 5.3.10, Vegetation Management:

- Minimize the number of trees to be removed; and
- Leave existing low growing species in the ROW undisturbed

Section 5.3.12, Invasive Species:

- Employ best management practices to avoid introducing and spreading invasive species on areas disturbed by construction; and
- Develop an Invasive Species Prevention Plan.

Section 5.3.13, Noxious Weeds:

- Take all reasonable precautions against the spread of noxious weeds during all phases of construction; and
- Select site-appropriate seed and certified to be free of noxious weeds.

To integrate the standard conditions, and to consolidate feedback from interested state agencies regarding vegetation management into one document, a special condition has been included in the draft Route Permit for GRE to prepare a Vegetation Management Plan for the project. A draft VMP was included in GRE's application as Appendix I, and will be reviewed by the Vegetation Management Plan Working Group based on the permitted project and associated permit conditions.

- Section 6.7, Vegetation Management Plan: The Permittee shall develop a Vegetation Management Plan in coordination with the Vegetation Management Plan Working Group, incorporate requirements from MDNR and BWSR, provide a sequence for the management methods proposed, and for monitoring the growth of vegetation.

5.6.8 Wildlife

Impacts to wildlife can occur during construction and operation. Impacts on wildlife are assessed by evaluating the vegetation cover and habitat in the ROW. Impacts to sensitive wildlife habitat and known occurrences of sensitive wildlife species are analyzed in **Section 5.6.9, Rare and Unique Resources**.

Although the area has been substantially developed into commercial and residential use, land in northern Dakota County provides habitat for squirrels, rabbits, deer, coyotes, foxes, songbirds, raptors, and small mammals. Suitable roosting habitat for bats may be present within the forested areas. Limited wetlands and ponds may also provide habitat for aquatic species, such as turtles, fish, frogs, and toads.

5.6.8.1 Impacts

During construction, there is a potential for erosion and sediment control products to negatively affect wildlife. The MDNR recommends that erosion control blankets be limited to "bio-netting" or "natural netting" types to reduce the potential for entanglement with small animals, and specifically not products containing plastic mesh netting or other plastic components. Special Condition 6.4 has been added to the draft Route Permit to reduce impacts to wildlife resulting from the use of erosion and sediment control products during construction.

Ground disturbing activities, particularly during construction, have the potential to produce dust when disturbed soil particles become entrained in the atmosphere. Dust from construction activities can be controlled using standard construction practices such as watering of exposed surfaces, covering of disturbed areas, reduced speed limits, and the use of chemical dust suppressants. Dust suppressants containing chloride are persistent in the environment, and can accumulate to levels toxic to plants and wildlife. Special Condition 6.5 has been added to the draft Route Permit to prohibit the use of chloride-containing dust suppressants during construction and operation.

Animals depend on the daily cycle of light and dark for behaviors such as hunting, migrating, sleeping, and protection from predators. In addition to the undesirable effects of upward facing lighting, the hue of lights can also affect wildlife. LED lighting has become increasingly popular due to its efficiency and long lifespan. However, these bright lights tend to emit blue light, which can be harmful to birds, insects, and fish. The MDNR recommends that any projects using LED luminaries follow the MnDOT Approved Products for luminaries, which limits the uplight rating to zero. A nominal color temperature below 2700K is preferable for wildlife, and selecting products that have the lowest number for backlight and glare. Special Condition 6.6 has been added to the draft Route Permit to reduce impacts to wildlife resulting from lighting at the substations.

Additionally, during construction, there is a potential to displace wildlife from ROW clearing and the use of loud equipment. This wildlife is typical of those found in urban developed settings, and would be able to find similar habitat nearby, minimizing impacts resulting from construction. The presence of nesting birds is analyzed in **Section 5.6.9, Rare and Unique Resources**.

Raptors, waterfowl, and other bird species may be affected by the transmission line. Waterfowl are typically more susceptible to transmission line collision, particularly if the transmission line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas for the waterfowl. GRE would design and construct the transmission line in accordance with Avian Power Line Interaction Committee (APLIC) guidelines.[84]

5.6.8.2 Mitigation

Impacts to birds can be reduced by designing and constructing the transmission line in accordance with APLIC guidelines. Additional bird protections can be found in Special Condition 6.10, Protection of Nesting Birds, presented in **Section 5.6.9, Rare and Unique Resources.**

Special conditions have been included in the draft Route Permit to minimize impacts to wildlife:

[84] Application, p. 7-46

- Section 6.4, Wildlife-friendly Erosion Control: To protect plants and wildlife from chloride products that do not break down in the environment, the Permittee shall use erosion control blankets limited to "bio-netting" or "natural netting" types, and shall specifically not use products containing plastic mesh netting or other plastic components, including hydro-mulch products that may contain small synthetic (plastic) fibers to aid in its matrix strength.
- Section 6.5, Dust Control: The Permittee is prohibited from using dust control products containing calcium chloride or magnesium chloride during construction and operation.
- Section 6.6, Facility Lighting: To reduce harm to birds, insects, and other animals, the Permittee shall utilize downlit and shielded lighting. Lighting utilized shall minimize blue hue.

5.6.9 Rare and Unique Resources

Rare and unique resources include assemblages of species or habitat that are designated for special care and conservation by state and federal agencies because loss of habitat and small or shrinking population is cause for concern. Rare and unique resources at the federal level are typically evaluated and protected by the USFWS. Project applicants can access information about plants and wildlife protected by federal law through the Information for Planning and Consultation (IPaC) tool developed and maintained by the USFWS. In addition, the USFWS administers the National Wildlife Refuge System, a diverse network of lands and waters dedicated to conserving America's rich fish and wildlife heritage.[85]

At the state level, the evaluation and protection of Minnesota's rare and unique resources is overseen by the MDNR through the identification and evaluation of native plant communities, native prairie, plants, wildlife, and unique wetlands such as calcareous fens. Native prairie is defined as land that has never been plowed where native prairie vegetation originating from the site currently predominates or, if disturbed, is predominantly covered with native prairie vegetation that originated from the site.[86] Calcareous fens are rare groundwater-fed wetlands that are sensitive to changes in water quality and quantity. Information about rare and unique resources protected by the state can be found through (1) a review of Sites of Biodiversity Significance (SOBS) maps maintained by the Minnesota Biological Survey (MBS); and (2) requesting information from the Natural Heritage Information System (NHIS). Although these reviews do not represent a comprehensive survey, they provide information on the potential presence of rare and unique species and habitats.

5.6.9.1 Impacts

The project vicinity is largely developed with commercial and residential development, with some stands of trees, and wetlands and open water. This combination of altered and unaltered landscape has the potential to support rare and unique resources that may be adversely affected by the project.

GRE submitted a request to the USFWS IPaC website, as well as the MDNR's NHIS for documented occurrences of federally listed species, designated critical habitat, and state-listed species within a minimum 250 feet of the proposed centerline. The information returned from both agencies is provided in **Appendix J**, and summarized in **Table 16** below. Sites of Biodiversity Significance and calcareous fens are shown on **Figure 4, Sites of Biodiversity Significance and Calcareous Fens**.

[85] https://www.fws.gov/program/national-wildlife-refuge-system
[86] Minn. Stat. 84.02 Subd. 5

Table 16 Rare and Unique Resources in the Project Vicinity

Information Source	Species/Resource	Protection Classification	Potential for Project to Affect Resource
USFWS	Northern long-eared bat (*Myotis septentrionalis*)	Federal Endangered	Yes, see discussion below
USFWS	Rusty patched bumble bee (*Bombus affinis*)	Federal Endangered	Yes, see discussion below
USFWS	Higgins eye (pearlymussel) (*Lampsilis higginsii*)	Federal Endangered	No; habitat not present in Route Width
USFWS	Tricolored bat (*Perimyotis subflavus*)	Federal Proposed Endangered	Yes, see discussion below
USFWS	Monarch butterfly (*Danaus plexippus*)	Federal Candidate	Yes, see discussion below
MDNR	Blanding's turtle (*Emydoidea blandingii*)	State Threatened	Yes, see discussion below
MDNR	Edible valerian (*Valeriana edulis var. ciliate*)	State Threatened	No; habitat not present in Route Width
MDNR	Tuberous Indian-plantain (*Arnoglossum plantagineum*)	State Threatened	No; habitat not present in Route Width
MDNR	Small White Lady's-slipper (*Cypripedium candidum*)	State Special Concern	No; habitat not present in Route Width
MDNR	Trumpeter Swan (*Cygnus buccinator*)	State Special Concern	No; habitat not present in Route Width
MDNR	Bell's Vireo (*Vireo bellii*)	State Special Concern	Yes, see discussion below
MDNR	Rattlebox (*Crotalaria sagittalis*)	State Special Concern	No; habitat not present in Route Width
MDNR	Sites of Biodiversity Significance	Protection driven by resources present	Yes, see discussion below
MDNR	Native Prairie	Land easement or purchase	Native prairie identified are associated with SOBS above
MDNR	Native Plant Communities	Protection driven by resources present	Native Plant Communities identified are associated with SOBS above.
MDNR	Calcareous Fens	Federal and state protected wetland	Yes, see discussion below

According to GRE's review of the USFWS IPaC, there are two species that are listed as threatened or endangered under the federal Endangered Species Act (northern long-eared bat [NLEB] and rusty patched bumble bee); one species proposed for listing as endangered (tricolored bat); and one candidate species (monarch butterfly) that may be present within the route width. There was no designated critical habitat for protected species identified within the project vicinity. Similarly, for state-protected species, one species listed as threatened (Blanding's turtle) and one species of special concern (Bell's vireo) may be present within the route width.

Minnesota Valley National Wildlife Refuge is approximately one mile from the project. The tallgrass prairie, floodplain forests and wetlands found within the refuge provide exceptional opportunities to find iconic and rare species of plants, birds, insects and freshwater mussels. Bald eagles, wood ducks, river otters, prairie skinks, and white-tailed deer are also present at the refuge. Endangered and threatened species such as the northern long-eared bat, rusty-patched bumblebee and rare freshwater mussels benefit from the protected habitats found throughout the refuge.[87] This area or its management of resources would not be affected by project construction or operation.

Both the northern long-eared bat and tricolored bat hibernate in caves and mines. After spring emergence, bats migrate to summer roosting and foraging grounds. In summer, the NLEB is often associated with forested habitats, where they make use of tree roosts, especially near water sources. Tricolored bats generally roost singly, often in trees, but also roost in caves and mines. The project would require the removal of 9.5 acres of trees. During the wetlands permitting process (see **Section 5.6.6, Surface Water Resources**), the USACE will consult with the USFWS regarding the potential effects to protected plants and wildlife that could result from the permitted activities, and protective measures to avoid impacts to these species may be required. Additionally, the MDNR monitors northern long-eared bat occurrence in the state, and recommends tree removal take place outside the pup rearing season when females are forming maternity roosting colonies and the pups cannot yet fly. To minimize impact to bats, the MDNR recommended that tree removal be avoided from June 1 through August 15. This has been included as Special Condition 6.8 in the draft Route Permit.

Rusty patched bumble bees have been observed in a variety of habitats, including prairies, woodlands, marshes, agricultural landscapes, and residential parks and gardens. The rusty patched bumble bee requires areas that support sufficient food, including nectar and pollen from diverse and abundant flowers, as well as undisturbed nesting sites that are in proximity to those floral resources. Rusty patched bumble bee nests are typically 1 to 4 feet underground in abandoned rodent nests or other mammal burrows and occasionally at the soil surface or aboveground. Rusty patched bumble bee queens are thought to overwinter in upland forest and woodlands.[88] Determining mitigation measures to avoid impacts to the rusty patched bumble bees would require additional consultation with the USFWS based on activities, schedule, and disturbance estimates that would be developed during final engineering of the project. As described above for the bats, the USACE would consult with the USFWS during GRE's wetlands permitting process prior to construction, and additional protections for this species may be required.

Monarch butterflies in the Upper Midwest of the US can be found in fields, roadside areas, open areas, wet areas, and urban gardens. Milkweed and flowering plants are needed for monarch habitat. Adult

[87] https://www.fws.gov/refuge/minnesota-valley
[88] https://www.fws.gov/species/rusty-patched-bumble-bee-bombus-affinis

monarchs feed on the nectar of many flowers during breeding and migration, but they can only lay eggs on milkweed plants.[89] The monarch butterfly is a candidate species for protection, but does not have federal protective requirements. Impacts to monarch butterflies would be reduced by minimizing disturbance of flowering plants during construction, and where property owners are amenable within the ROW, revegetating with flowering plants after construction.

Blanding's turtle depend on wetland complexes and adjacent sandy uplands to support their population. Calm, shallow waters, including wetlands associated with rivers and streams with rich aquatic vegetation are especially preferred. In Minnesota, this species appears fairly adaptable, utilizing a wide variety of wetland types and riverine habitats in different regions of the state. Ephemeral wetlands are utilized in spring and early summer, while deeper marshes and backwater pools are utilized in both the summer and winter.[90] The MDNR has proposed protective measures to reduce the potential to affect Blanding's turtle by project activities.[91] These protective measures have been included as Special Condition 6.9 in the draft Route Permit (**Appendix C**).

The Bell's vireo has been documented in the vicinity of the project. In Minnesota, Bell's vireo prefers shrub thickets within or bordering open habitats such as grasslands or wetlands. This bird suspends its nests from forks of low branches of small trees or shrubs. Bell's vireo is a species of special concern in Minnesota, but does not have statutory protective requirements. The MDNR recommends avoiding tree and shrub removal from May 15th through August 15th to avoid disturbance of nesting birds, and it has been included as Special Condition 6.10 in the draft Route Permit (**Appendix C**). Additionally, GRE would report migratory bird nests discovered during survey of the line prior to construction or maintenance to the USFWS in accordance with the Migratory Bird Treaty Act, and adhere to guidance provided,[92] which may include maintaining a buffer around the nest where loud or disturbing activity does not take place until the nestlings have fledged.

There are two MBS SOBS within the project vicinity (Thomas Lake Park SOBS and Burnsville 19 SOBS). Thomas Lake Park SOBS (ranked as Moderate) is located approximately 100 feet southwest of the Pilot Knob Substation. This site is approximately 50 acres mapped as native prairie (approximately 27 acres) and native red oak - white oak forest. The area is presently utilized as a park by the City of Eagan and as a housing development. The eastern portion of Burnsville 19 SOBS (ranked as Moderate) is approximately 300 feet east of the project less than a mile from the Burnsville Substation. It is mapped as approximately 20 acres of a natural plant community of red oak-white oak forest. [93] The area is presently utilized as a housing development. These areas are shown on **Figure 4**. The natural landscape of these two SOBS has been modified, and construction and operation of the project would not modify it further.

There are 13 locations associated with four calcareous fens (**Figure 4**) within five miles of the project, the nearest being approximately 1 mile from the project. Calcareous fens depend on a constant supply of upwelling groundwater rich in calcium and other minerals. Because of this dependence on groundwater hydrology, calcareous fens can be affected by activities impacting groundwater or surface

[89] https://www.fws.gov/species/monarch-danaus-plexippus
[90] https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ARAAD04010
[91] Please note the MDNR updated the Blanding's turtle reporting protocols (Correspondence, MDNR to Commerce, July 30, 2024)
[92] Application, p. 7-46
[93] https://mnatlas.org/resource_category/biota/

water hydrology, even those several miles away. As described in **Section 5.6.4, Geology and Groundwater**, groundwater is within 20 feet of the surface in 85 percent of the route width, and a small amount of groundwater is expected to be displaced to the ground surface during installation of poles and foundations in the saturated zone. This minimal loss of groundwater during construction is unlikely to affect the calcareous fens. GRE will continue to coordinate with MDNR on this issue as the project develops.[94]

5.6.9.2 Mitigation

Special conditions have been included in the draft Route Permit to minimize impacts to rare and unique resources:

- Section 6.8, Protection of Bats: Avoid tree removal from June 1 through August 15.
- Section 6.9, Protections for Blanding's Turtle: Measures include avoiding wetland and aquatic impacts during hibernation season, checking construction areas for turtles before the use of heavy equipment or any ground disturbance, providing the Blanding's turtle flyer to all contractors working on site, monitoring the sites for turtles during construction, and moving turtles to safety by hand if in imminent danger.
- Section 6.10, Protection of Nesting Birds: Avoiding tree and shrub removal from May 15th through August 15th.

[94] Application, 7-44

6 Section SIX: Cumulative Potential Effects and Unavoidable Impacts

This section analyzes the effects of impacts that could occur from the proposed project in conjunction with other projects in the area, commonly referred to as cumulative impacts. This section also identifies actions that could occur in the future as a result of the project (associated actions), and summarizes impacts that cannot be avoided.

6.1 Cumulative Potential Effects

Cumulative potential effects result when impacts from the proposed project are combined with impacts associated with past, present, or reasonably foreseeable future actions within the area. Analysis of cumulative potential effects accounts for the possibility that the minor impacts of many separate actions could be significant. considers resources that are expected to be affected by the proposed project and assesses past, present, and reasonably foreseeable future actions to identify any geographic or temporal overlap in impacts on these resources.

When making the determination as to what is "reasonably likely to occur," EERA considers whether any applications for permits have been filed with units of local government or whether detailed plans and specifications have been prepared for the project, among other considerations. A project is not required to be permitted to be reasonably likely to occur.

Past actions are those actions and their associated impacts that occurred within or influenced the geographic region of influence of each resource and have shaped the current affected environment of the project. For the purposes of this EA, actions that have occurred in the past and associated impacts are now part of the existing environment and are included in **Section Five, Affected Environment, Potential Impacts, and Mitigation**.

In addition to temporal factors, the potential for cumulative impacts also depends on spatial factors within the environment, which can vary for the resources evaluated in this EA. For example, the geographic area of consideration for cumulative impacts could be limited to the discrete area of disturbance for vegetation resources but also include a wider radius for other resources, such as air quality or wildlife.

Future projects identified in the area include:

- Greenway and trail corridors connecting Lebanon Hills Regional Park to areas north and west.
- Sanitary sewer facilities maintenance and replacement in the City of Eagan
- Bridge resurfacing on I-35W between Cliff Road and the I-35/I-35E/I-35W split

The cumulative effects of the project, in combination with the above-listed future projects, would be minimal, given the relatively small size of the project, the required coordination GRE conducts with local agencies, the low human and environmental impact of the proposed project, and the project's components being largely contained within existing ROW.

6.2 Associated Actions

Associated actions occur as a result of the project. Associated actions that could follow construction of the project include:

- Underbuild of distribution lines: Existing Dakota Electric Association distribution lines along the alignment could be transferred to the new structures;
- New and upgraded electrical equipment at substations: In the future, if the project is energized at 115 kV, new transformers, protection equipment, and other substation upgrades may be necessary; and
- Decommissioning of 69 kV: Segments of 69 kV may be decommissioned when the project is energized at 115 kV.

6.3 Unavoidable Impacts

Resource impacts are unavoidable when an impact cannot be avoided even with mitigation strategies. Transmission lines are infrastructure projects that have unavoidable adverse human and environmental impacts. These potential impacts and the possible ways to mitigate against them were discussed above. However, even with mitigation strategies, certain impacts cannot be avoided.

Unavoidable adverse impacts associated with construction of the project include:

- Possible traffic delays and fugitive dust on roadways;
- Visual and noise disturbance to nearby residents and recreationalists;
- Soil compaction and erosion;
- Vegetative clearing, including permanent loss of trees; and
- Disturbance and temporary displacement of wildlife.

Unavoidable adverse impacts associated with the operation of the project include:

- Visual impact of taller structures and more prominent conductor;
- Injury or death of avian species that collide with, or are electrocuted by, conductor; and
- On-going maintenance of woody vegetation (tree trimming and removal).

6.4 Irreversible and Irretrievable Resource Commitments

Resource commitments are irreversible when it is impossible or very difficult to redirect that resource to a different future use; an irretrievable commitment of resources means the resource is not recoverable for later use by future generations.

Irreversible impacts include wetland conversion, and the emissions of air pollutants and greenhouse gas into the atmosphere.

Irretrievable commitment of resources is primarily related to project construction, including the use of aggregate, hydrocarbons, steel, concrete, and other consumable resources. The commitment of labor and fiscal resources is also considered irretrievable.

List of Acronyms and Abbreviations

Acronyms and Abbreviations	
ACSS	Aluminum-clad steel supported
ALJ	Administrative Law Judge
APLIC	Avian Power Line Interaction Committee
Applicant	Great River Energy
ARMER	Allied Radio Matrix for Emergency Response
BWSR	Board of Water and Soil Resources
CH4	Methane
CO	Carbon monoxide
CO2	Carbon dioxide
CO2e	Carbon dioxide equivalents
Commerce	Minnesota Department of Commerce
Commission	Minnesota Public Utilities Commission
dB	Decibels
dBA	Decibels on the A-weighted scale
EA	Environmental Assessment
EERA	Energy Environmental Review and Analysis
EMF	Electric and magnetic fields
FAA	Federal Aviation Administration
GHG	Greenhouse gas
GRE	Great River Energy
GWP	Global warming potential
HVTL	High-voltage transmission line
I-35E	Interstate 35E
IPaC	Information for Planning and Consultation
kV	Kilovolt
kV/m	Kilovolts per meter
mA	Milliamps
MBS	Minnesota Biological Survey
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
mG	Milligauss
MIAC	Minnesota Indian Affairs Council
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
N_2O	Nitrous oxide
NAC	Noise Area Classification
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NLEB	Northern long-eared bat

Acronyms and Abbreviations	
NO2	Nitrogen dioxide
NPDES	National Pollutant Discharge Elimination System
NRHP	National Registry of Historic Places
OSA	Office of the State Architect
PM2.5	Particulate matter less than 2.5 microns
ROI	Region of influence
ROW	Rights-of-way
SDS	State Disposal System
SF6	Sulfur hexafluoride
SHPO	State Historic Preservation Office
SOBS	Site of Biodiversity Significance
SSA	Sole-source aquifer
THPO	Tribal Historic Preservation Officer
tpy	Tons per year
TSP	Total suspended particles
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
VMP	Vegetation Management Plan
WCA	Wetland Conservation Act
WHPA	Wellhead protection area

Appendices