GREAT RIVER ENERGY

APPLICATION TO THE
MINNESOTA PUBLIC UTILITIES COMMISSION
FOR A ROUTE PERMIT TO

REROUTE EXISTING 115-kV CEDAR LAKE TRANSMISSION LINE IN SCOTT AND RICE COUNTIES, MN

DOCKET NO.
ET2/TL-23-170

GREAT RIVER ENERGY™

June 6, 2023

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LIST OF ACRONYMS

AIMD	Active Implantable Medical Devices
ALJ	administrative law judge
APLIC	Avian Power Line Interaction Committee
Applicant	Great River Energy
Application	Route Permit Application
BMPs	best management practices
Brookings Project	Brookings County – Hampton 345 kV Project
BWSR	Board of Water and Soil Resources
CapX2020	Existing 345-kV transmission line/structures associated with the Brookings Project
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Commission	Minnesota Public Utilities Commission
dBA	Decibel – A weighted
DKey	Determination Key
DOC	Department of Commerce
EA	Environmental Assessment
EERA	Energy Environmental Review and Analysis
EF	electric fields
EJ	Environmental Justice
EJScreen	Environmental Justice Screening Tool
ELF	Extremely Low Frequency
EMF	electromagnetic fields
EQB	Minnesota Environmental Quality Board
ESA	Endangered Species Act
°F	degrees Fahrenheit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
G	gauss
GLO	General Land Office
HVTL	High Voltage Transmission Line
IPaC	Information for Planning and Consultation
IMDs	implantable medical devices
kV	kilovolt
kV/m	kilovolts per meter
kW	kilowatt
LGU	Local Government Unit

mA rms	milliAmperes root mean square
MCE	Minnesota Conservation Explorer
MDA	Minnesota Department of Agriculture
MDNR	Minnesota Department of Natural Resources
Merjent	Merjent, Inc.
MF	magnetic fields
mG	milligauss
MIAC	Minnesota Indian Affairs Council
Minn. Stat. §	Minnesota Statutes Section
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
Minnesota Valley	Minnesota Valley Electric Cooperative
mph	miles per hour
MPCA	Minnesota Pollution Control Agency
MRO	Midwest Reliability Organization
MW	megawatt
N2O	nitrous oxide
NAC	Noise Area Classifications
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NIEHS	National Institute of Environmental Health Sciences
NLEB	northern long-eared bat
NO	nitrogen oxide
NO2	nitrogen dioxide
NOx	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Services
NSPM	Northern States Power
NWI	National Wetlands Inventory
OSA	Office of the State Archaeologist
Owners	Great River Energy, Central Minnesota Municipal Power Agency, Western Minnesota Municipal Power Agency, Northern States Power, and Otter Tail Power Company
ppb	Parts per billion
PEM	Palustrine Emergent
PFO	Palustrine Forested
PM2.5	fine particulate matter equal to or less than 2.5 microns in diameter
PM10	particulate matter equal to or less than 10 microns in diameter
Project	Rebuild the existing 69-kV ST-WW transmission line to a new 115-kV transmission line to be named the ST-WS line
Promising Practices	Promising Practices for EJ Methodologies in NEPA Reviews

Proposed Alignment	the general path that a transmission line will follow
Proposed Route	The corridor in which Great River Energy proposes to build the approximately 6.3-mile transmission line presented in this Route Permit Application.
PSS	Palustrine Scrub-Shrub
RIM	Reinvest in Minnesota
ROW	right-of-way
SHPO	State Historic Preservation Office
SO2	sulfur dioxide
STATSGO2	Digital General Soil Map of the United States
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
WMA	Wildlife Management Area
WPA	Waterfowl Production Area

Route Permit Application – Alternative Process Completeness Checklist

Authority	Required Information	Location in Application
Minn. Stat. § 216E.04, subd. 2(3)	**Alternative Review of Applications**. Alternative review is available for high voltage transmission lines (HVTL) of between 100 and 200 kV	2.2
Minn. Stat. § 216E.04, subd. 4; Minn. R. 7850.2800, Subp. 1(C)	Subpart 1. **Eligible Projects**. An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7850.2800 to 7850.3900 instead of the full permitting procedures in parts 7850.1700 to 7850.2700: **high voltage transmission lines of between 100 and 200 kilovolt (kV)**	Appendix C
Minn. R. 7850.2800, Subp. 2.	Subpart 2. **Notice to Minnesota Public Utilities Commission (Commission)**. An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7850.2800 to 7850.3700, shall notify the Commission of such intent, in writing, at least ten days before submitting an application for the project	Appendix C
Minn. R. 7850.3100	**Contents of Application** (alternative permitting process) The applicant shall include in the application the same information required in part 7850.1900, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them	This document.
Minn. R. 7850.1900, Subp. 2 (as applicable per Minn. R. 7850.3100)	**Route Permit for HVTL** A. a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	3.3
	B. the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	3.3
	C. rejected alternative routes and the reasons for rejecting	Chapter 4
	D. a description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line	3.1; 3.2
	E. the environmental information required under 7850.1900, Subp. 3	Chapter 6
	F. identification of land uses and environmental conditions along the proposed routes	Chapter 6
	G. the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix E
	H. United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes	Figure 1-2; Figure 3-1; Appendix A

Authority	Required Information	Location in Application
	I. identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way (ROW) with the proposed line	5.3
	J. the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line	3.2; 6.3.1
	K. cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route	3.5; 5.7
	L. a description of possible design options to accommodate expansion of the high voltage transmission line in the future	5.2
	M. the procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the high voltage transmission line	5.4; 5.5; 5.6; 5.7
	N. a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	2.3; Table 2-1
	O. a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required	2.1
Minn. R. 7850.1900, Subp. 3	**Environmental Information** A. a description of the environmental setting for each site or route	6.1
	B. a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services	6.2; 6.3
	C. a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	6.5
	D. a description of the effects of the facility on archaeological and historic resources	6.6
	E. a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna	6.7
	F. a description of the effects of the facility on rare and unique natural resources	6.7.5
	G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	6.10
	H. a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures	3.5; Chapter 6
Minn. R. 7850.2100, Subp. 2 (applicable per Minn. R. 7850.3300)	**Notice of Project** Notification to persons on the Commission's general list, to local officials, and to property owners	To be provided

Authority	Required Information	Location in Application
Minn. R. 7850.2100, Subp 4	Publication of notice in a legal newspaper of general circulation in each county in which the route is proposed to be located.	To be published
Minn. R. 7850.2100. Subp. 5	Confirmation of notice by affidavits of mailing and publication with copies of the notices	Submit when available
Minn. R. 7850.4100	**Factors to be Considered in Permitting a HVTL** A. effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services	6.2
	B. effects on public health and safety	6.3
	C. effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	6.5
	D. effects on archaeological and historic resources	6.6
	E. effects on the natural environment, including effects on air and water quality resources and flora and fauna	6.7
	F. effects on rare and unique natural resources	6.7.5
	G. application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity	3.2; 5.2
	H. use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries	3.2; 5.3
	I. use of existing large electric power generating plant sites	Not applicable
	J. use of existing transportation, pipeline, and electrical transmission systems or rights-of-way	5.3
	K. electrical system reliability	1.5; 7.1
	L. costs of constructing, operating, and maintaining the facility which are dependent on design and route	3.5
	M. adverse human and natural environmental effects which cannot be avoided	6.10
	N. irreversible and irretrievable commitments of resources	6.10
Minn. R. 7850.4300, Subps. 1 and 2	Prohibited Routes **Wilderness areas**. No high voltage transmission line may be routed through state or national wilderness areas **Parks and natural areas**. No high voltage transmission line may be routed through state or national parks or state scientific and natural areas unless the transmission line would not materially damage or impair the purpose for which the area was designated, and no feasible and prudent alternative exists. Economic considerations alone do not justify use of these areas for a high voltage transmission line	No wilderness areas or parks are crossed

Authority	Required Information	Location in Application
Minn. Stat. §216E.03, Subd.7 (applicable per Minn. Stat. §216E.04, Subd. 8), House File 7 amendments (2023)	**Considerations in designating sites and routes** (1) Evaluation of research and investigations relating to the effects on land, water and air resources of large electric power generating plants and high voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including base line studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment	Chapter 6
	(2) Environmental evaluation of sites and routes proposed for future development and expansion and their relationship to the land, water, air, and human resources of the state	5.2
	(3) Evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants designed to minimize adverse environmental effects	Not applicable
	(4) Evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants	Not Applicable
	(5) Analysis of the direct and indirect economic impact of proposed sites and routes including, but not limited to, productive agricultural land lost or impaired	6.4; 6.5
	(6) Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted	Chapter 6
	(7) Evaluation of alternatives to the applicant's proposed site or route proposed pursuant to subdivisions 1 and 2	Chapter 4
	(8) Evaluation of potential routes that would use or parallel existing railroad and highway rights-of way	5.3; Chapter 6
	(9) Evaluation of governmental survey lines and other natural division lines of agricultural land to minimize interference with agricultural operations	5.3; 6.5.1
	(10) Evaluation of the future needs for additional high voltage transmission lines in the same general area as any proposed route, and the advisability of ordering the construction of structures capable of expansion in transmission capacity through multiple circuiting or design modifications	5.2
	(11) Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved	6.10
	(12) When appropriate, consideration of problems raised by other state and federal agencies and local entities	Not applicable
	(13) Evaluation of the benefits of the proposed facility with respect to (i) the protection and enhancement of environmental quality, and (ii) the reliability of state and regional energy supplies	Chapter 7; 1.5
	(14) evaluation of the proposed facility's impact on socioeconomic factors	6.2.4

Authority	Required Information	Location in Application
	(15) evaluation of the proposed facility's employment and economic impacts in the vicinity of the facility site and throughout Minnesota, including the quantity and quality of construction and permanent jobs and their compensation levels. The commission must consider a facility's local employment and economic impacts and may reject or place conditions on a site or route permit based on the local employment and economic impacts.	3.7

1 INTRODUCTION

Great River Energy submits this Route Permit Application (Application) to the Minnesota Public Utilities Commission (Commission) for a Route Permit to construct approximately 6.3 miles of 115-kilovolt (kV) high voltage transmission line (HVTL), referred to as the Cedar Lake Reroute Project (Project). The Project will begin at the existing Cedar Lake Substation and connect to Great River Energy's existing MV-EVX 115-kV transmission line near the intersection of 280th St E / State Highway 19 and Panama Avenue / County Highway 23. The Project is a reroute of approximately 4.5 miles of the existing MV-CDT 115-kV transmission line, which presently connects the Cedar Lake Substation to the MV-EVX 115-kV near the intersection of 260th Street / County Road 2 and Panama Avenue / County Highway 23. The Project occurs in Helena and Cedar Lake Townships, east of the City of New Prague, in Scott County, and in Wheatland Township, in Rice County, Minnesota.

Great River Energy's existing MV-CDT 115-kV circuit supplying power to the Cedar Lake Substation is currently located on the structures that were built for the CapX2020 Brookings County – Hampton 345 kV Project (Brookings Project) along County Road 2, which is north of the Cedar Lake Substation. This 115-kV circuit must be decommissioned and removed in accordance with the contractual conditions that Great River Energy has with the CapX2020 owners to make room for a new, second 345-kV circuit on the existing CapX2020 structures[1]. Great River Energy must build a new transmission line to supply power to the Cedar Lake Substation before the existing line can be decommissioned. The Project will be built to provide 115-kV service to the Cedar Lake Substation to meet long-term planning needs in the Project area but will initially operate at 69-kV. Designing to 115-kV standards will simplify operation of the regional transmission system at 115-kV as electrification and load development increase in the area.

Great River Energy anticipates starting construction in fall of 2024 and energizing the transmission line in the summer of 2025. This timeline is consistent with Great River Energy's contractual obligation to vacate the CapX2020 structures so that the owners may install a second 345-kV circuit. Great River Energy's contractual obligations require that the existing 115-kV line be removed from the CapX2020 structures by September 2025.

1.1 Great River Energy Organization and System Background

Great River Energy is a not-for-profit wholesale electric power cooperative based in Maple Grove, Minnesota. Great River Energy provides electricity and related services to approximately 1.7 million people through its 27 member-owner cooperatives and customers. Through its member-owners, Great River Energy serves two-thirds of Minnesota geographically and parts of Wisconsin. This includes Minnesota Valley Electric Cooperative (Minnesota Valley), the distribution cooperative serving the area in which the Project will be located (**Figure 1-1**), and transmission customers. Great River Energy's electric system is interconnected directly with

[1] The existing 345-kV transmission line and structures associated with the Brookings Project are referred to as "CapX2020" in this Application.

neighboring suppliers and is a member of the Midwest Reliability Organization (MRO) and Midcontinent Independent System Operator (MISO).

Great River Energy and its cooperatives' mission is to provide safe, reliable, competitively priced energy to those served. Great River Energy's power plants have the capability to generate more than 1,800 megawatts (MWs), including over 480 kilowatts (kWs) from solar arrays. In addition, Great River Energy has power purchase agreements for 960 MWs of wind, 200 MWs of hydroelectric energy diversity exchange, and 550 MWs currently from Coal Creek Station that it formerly owned. Great River Energy owns over 4,300 miles of transmission line (69-kV or higher) in Minnesota, North Dakota, South Dakota, and Wisconsin. Great River Energy carefully designs and maintains a portfolio of power generation facilities and transmission resources to deliver reliable and affordable wholesale electricity to the regional electricity market and member-owner cooperatives.

1.2 Project Contact

The contact for the Project and this Application is:

Mark Strohfus
Great River Energy
Project Manager, Transmission Permitting
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Maple Grove, MN 55369
763-445-5210
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1.3 Project Location

The Project is located in Helena[2] and Cedar Lake Townships, east of the City of New Prague, in Scott County, and Wheatland Township in Rice County[3], Minnesota. The Project Route is located in the following Township, Ranges, and Sections shown in **Table 1.3-1**.

Table 1.3-1. Townships, Ranges, and Sections Crossed by the Project Route

Township Name	Township	Range	Sections
Helena	T113N	R23W	25, 36
Cedar Lake	T113N	R22W	30, 31, 32, 33, 34, 35
Wheatland	T112N	R22W	2, 3, 4, 5, 6

1.4 Proposed Project

Great River Energy proposes to relocate the existing MV-CDT 115-kV transmission line system

[2] The Cedar Lake Substation and approximately 0.4 mile of the proposed transmission line are located in Helena Township.

[3] For approximately 4 miles, the Proposed Route would be parallel to 280th St E/State Highway 19, which occurs on the border between Scott and Rice Counties. The Proposed Alignment may be located on the north (Scott County) or south (Rice County) of 280th St E/State Highway 19 along this segment of the Proposed Route.

that is currently located on the CapX2020 structures along County Road 2. The Project includes the installation of a new 6.3-mile 115-kV transmission line in Scott and Rice Counties.

Great River Energy proposes that the Project follow an approximately 6.3-mile route starting from the Cedar Lake Substation to the connection point with Great River Energy's existing MV-EVX 115-kV line. The Proposed Route is shown in **Figure 1-2**. **Appendix A** contains a series of larger scale aerial photo maps depicting the Proposed Alignment, right-of-way (ROW), and requested route width (Proposed Route) for the Project.

Great River Energy will use single-pole wood structures with horizontal post insulators for most of the transmission line. H-frame, 3-pole structures, laminated wood poles, or steel poles may be required in some locations (e.g., to cross under an existing line, for angle poles, or in areas where soil conditions are poor, and guying is not practical). A switch pole will be needed where the Project will connect to the MV-EVX line. Typical pole heights will range from 60 to 90 feet above ground and spans between poles will range from 300 to 400 feet.

At this time, Great River Energy anticipates that the Project will require easements which allow for a ROW width of 100 feet (typically 50 feet of each side of the transmission centerline).

Minnesota Valley has existing overhead distribution lines in the Project Route. Where the Project overtakes distribution lines, it is Great River Energy's understanding that Minnesota Valley would likely decommission those lines and bury new lines rather than attaching the distribution lines as under-build to the Project's new structures. This would include locations along Baseline Avenue, and 280th St E/State Highway 19. Because the distribution lines are owned and maintained by Minnesota Valley, rather than Great River Energy, Great River Energy will not conduct or direct any activities related to the distribution lines. For reference, the location of existing distribution lines along the Proposed Alignment, 100-foot-wide ROW, and Proposed Route is depicted in **Appendix A**.

What is a route, alignment, and ROW?

A "route" is a wide corridor that is defined by the Public Utilities Commission in a route permit. It establishes the area in which Great River Energy will generally be authorized to construct its transmission line. As discussed later in this application, the route width varies along the length of the transmission line.

An "alignment" is the general path that a transmission line will follow. This application includes a proposed alignment, which is Great River Energy's initial thoughts on where the line will be built and where it turns or crosses from one side of a road to the other. The final alignment will likely be somewhat different due to input from landowners, agencies, and owners of other utilities in the area.

A "ROW" or "right-of-way" is a space around high voltage transmission lines that Great River Energy maintains and protects from encroachments to ensure the safe and reliable operation of the transmission line. Great River Energy anticipates seeking a 100-foot ROW, 50 feet perpendicular from both sides of the transmission centerline, for the Project. Where the transmission line parallels roads, Great River Energy will seek approximately 55 feet of ROW from landowners. The landowner will be compensated for the ROW as part of the easement acquisition process.

Separately, Great River Energy will also remove approximately 4.5 miles of its existing MV-CDT 115-kV transmission line from the CapX2020 structures. The existing structures will not be modified as part of the transmission line removal, and there will be no surficial impacts. Consistent with Great River Energy's contractual obligations, this removal is planned to occur by September 2025, and the Project will be required to be operational prior to such removal to ensure continued service to the Cedar Lake Substation.

Great River Energy estimates the Project will cost approximately $10.4 million dollars.

1.5 Project Need and Purpose

The Project is needed so the CapX2020 owners can install a second 345-kV circuit on the existing CapX2020 structures and to maintain a reliable transmission system in the vicinity of the Project. Over the last decade, Great River Energy has completed upgrades in the larger Cedar Lake area to a 115-kV transmission system to improve reliability and resiliency. The electric transmission system in the area is shown on **Figure 1-3**.

The Project, along with the CapX2020 second 345-kV circuit, will ensure that Great River Energy maintains reliable and resilient service to electric customers. The Project will address reliability concerns and, because it facilitates the CapX2020 second circuit, the Project will facilitate increased deliverability of renewable resources from southern Minnesota to the southwest metropolitan area. More details regarding the Project purpose and need are provided in the subsections below.

1.5.1 Need to Remove Existing Line from CapX2020 Structures

The Project will replace approximately 4.5 miles of existing 115-kV line connected to the Cedar Lake Substation. The existing 115-kV line is currently installed in the second circuit position on the CapX2020 structures 044 through 068 in the Helena to Chub Lake segment of the Brookings Project. On May 26, 2015, the Commission approved Great River Energy's request for a minor alteration to allow the temporary installation of the existing line.[4] As explained by Minnesota Department of Commerce (DOC) - Energy Environmental Review and Analysis (EERA) in its comments and recommendations regarding that request:

Great River Energy indicates that use of the existing double circuit structures to carry the 115-kV line is a temporary use and would continue until such time as the structures are needed to carry a new permanent transmission line. At that time, Great River Energy would be required to remove the 115-kV line and develop other means to serve the Cedar Lake substation.[5]

After the Commission approved Great River Energy's minor alteration request, the existing 115-kV line was installed pursuant to a Temporary Structure Sharing Agreement among Great River

[4] *See* Order, *In the Matter of the Great River Energy Application for a Minor Alteration to the Helena – Chub Lake Substation Segment of the Brookings County – Hampton 345 kV Transmission Line Project in Scott County, Minnesota*, Docket No. ET-2/TL-08/1474 (May 26, 2015).

[5] Comments and Recommendations of DOC-EERA Staff, *In the Matter of the Great River Energy Application for a Minor Alteration to the Helena – Chub Lake Substation Segment of the Brookings County – Hampton 345 kV Transmission Line Project in Scott County, Minnesota*, Docket No. ET-2/TL-08/1474 (Mar. 16, 2015).

Energy, Central Minnesota Municipal Power Agency, Western Minnesota Municipal Power Agency, Northern States Power (NSPM), and Otter Tail Power Company (together, the Owners), dated October 1, 2016. The Temporary Structure Sharing Agreement provides that Great River Energy must remove the existing 115-kV line when, in relevant part, the Owners provide written notice specifying the need for the Brookings Project Second Circuit Lines and a termination date no less than 30 months from the written notice.

On March 29, 2023, the Owners provided Great River Energy with notice of termination of the Temporary Structure Sharing Agreement, effective 30 months from the date of the notice. The notice of termination explained that it was being provided because:

…the finding from transmission planning studies and real-time operating conditions that a contingency of a portion of the existing Brookings Project Facilities (as defined by the Structure Sharing Agreement) is causing thermal loading above emergency ratings on a number of the existing lower voltage facilities during high wind conditions leading to considerable congestion occurring within the energy market. These thermal loading and congestion concerns will be remediated through the addition of two (2) separate second 345-kV circuits on the existing Brookings Project Facilities from (i) the NSPM Brookings County substation to the NSPM Lyon County substation, and (ii) from the NSPM Helena substation to the NSPM Hampton substation…This Brookings Second Circuit Line and the Cedar Lake Line Facilities cannot cohabitate. Consequently, the Cedar Lake Line must be removed and rerouted to continue serving load to accommodate the Brookings Second Circuit Lines. The eventual need for the Brookings Second Circuit Lines was anticipated under Section 11.3 of the Structure Sharing Agreement. Representatives of NSPM and Great River Energy (the Cedar Lake Line Owner) have begun working cooperatively and collaboratively to plan Brookings Second Circuit Lines construction and Cedar Lake Line demolition matters so that Great River Energy will meet the removal requirements of the thirty (30) month deadline, thereby allowing NSPM to timely construct the remaining Brookings Second Circuit Lines.

Accordingly, and as contemplated by the original minor alteration request, Great River Energy is now required to relocate the existing 115-kV line to allow the Owners to construct the remaining Brookings Project Second Circuit Lines.

1.5.2 Need for Project to Connect Cedar Lake Substation and Existing MV-EVX 115-kV

The existing 115-kV line serving the Cedar Lake Substation is a radial feed. In order to remove the circuit from the CapX2020 structures, a new 115-kV transmission line circuit must be built and connected to the Cedar Lake Substation.

1.6 Public Involvement

Great River Energy held an Open House at the American Legion Park Ballroom in New Prague, Minnesota, on March 29, 2023. Great River Energy staff were available to provide information to members of the public and answer questions concerning the Project. Large posters showing the existing/proposed transmission line alignment and pictures of what the pole structures would look like were also available for review.

Invitations to the meeting, including a Project fact sheet with maps, were mailed to all documented landowners along and adjacent to the Proposed Route as well as to representatives from regulatory agencies. Advertisements were also placed in three regional newspapers. Copies of these communications are provided in **Appendix B**. Great River Energy also maintains a web site that contains Project information at: https://greatriverenergy.com/transmission_project/cedar-lake-transmission-project/.

Twenty-eight people signed in at the Open House. Twenty of the attendees who signed in were landowners along the Proposed Route. The remainder of the attendees who signed in consisted of one local government representative and landowners in immediate vicinity of the Proposed Route.

Great River Energy technical representatives provided information about the Project and answered questions and/or responded to comments concerning:

- the reason for the Project;
- the process for permitting;
- tree/vegetation cutting or removal;
- what would be needed for easements;
- how easements are acquired; and
- when the permitting and construction process would occur.

Several landowners asked if Great River Energy could string the new proposed 115-kV line on existing distribution structures on their property. Some landowners had questions regarding electric magnetic fields (EMF) and transmission line safety. Some landowners expressed concern regarding the Project's impact on their property, including their property value, and/or impacts to operations on their property (e.g., access, equipment clearance, agricultural operations).

As a result of the comments received from landowners during the Open House, Great River Energy moved approximately 0.5 mile of the Proposed Alignment 500 feet east to parallel a property boundary in an effort to avoid bisecting the landowner's property, reduce potential equipment clearance issues for the landowner, and also reduce wetland and tree clearing impacts. This change will also reduce the number of poles on an adjacent parcel to the south. This change in the Proposed Alignment is reflected in this Application.

The public will be afforded additional opportunities to participate and comment on the Project in accordance with Minnesota laws and regulations. This process is described in **Section 2.2**. The first opportunity for public involvement in the regulatory process is a public information and scoping meeting conducted by Commission staff and the DOC-EERA staff after the Commission's acceptance of this Application as complete.

There are two options for citizens/landowners/interested persons to receive Project information:

> **1. Subscribe to the docket** (self-service, must subscribe for each docket of interest), receive email notifications when new documents are filed. Note - subscribing may result in a large number of emails.
>
> a). mn.gov/puc

b). Select green box *Subscribe to a Docket*

c). Type your e-mail address

d). For *Type of Subscription*, select *Docket Number*

e). For *Docket Number*, select *23* in the first box, type *170* in the second box

f). Select *Add to List*

g). Select *Save*

2. Sign up for the Project mailing list – sign up to receive notices about Project milestones and opportunities to participate (e.g., meetings, comment periods); may request email or U.S. Mail (not self-service, must contact Commission staff to sign up). Contact docketing.puc@state.mn.us or 651-201-2234 with the docket number (*23-170*), your name, mailing address, and email address.

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2 REGULATORY PROCESS

2.1 Certificate of Need Not Required

Minnesota Statutes Section (Minn. Stat. §) 216B.243, subdivision 2, states that "[n]o large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Public Utilities Commission..." A large energy facility is defined as "any high-voltage transmission line with a capacity of 100 kVs or more with more than ten miles of its length in Minnesota or that crosses a state line."[6] The proposed Project is less than ten miles in length and does not cross a state line; therefore, a Certificate of Need is not required.

2.2 Route Permit

Minn. Stat. § 216E.03, subdivision 2, provides that "[n]o person may construct a high voltage transmission line without a route permit from the commission." An HVTL is defined by Minn. Stat. § 216E.01, subd. 4, as "a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kVs or more and is greater than 1,500 feet in length." Because the Project consists of a 115-kV transmission line that is greater than 1,500 feet in length, a Route Permit from the Commission is required.

Minn. Stat. § 216E.04 provides for an Alternative Review Process for transmission lines between 100- and 200-kV; the Project is proposed as 115-kV and thus qualifies for alternative review. The permitting timeline for the Alternative Review Process is shorter than the timeline required for transmission lines over 200-kV. Great River Energy notified the Commission on May 3, 2023, pursuant to Minn. R. 7850.2800, Subp. 2 of its intent to utilize the Alternative Review Process and file its Application under Minn. R. 7850.2800 to 7850.3900. A copy of the notification letter is provided in **Appendix C**.

The rules that apply to the review of Route Permit Applications are found in Minn. R. Ch. 7850. Minnesota Rule 7850.1900, subparts 2 and 3, set forth the information that must be included in a Route Permit Application.

Under the Alternative Review Process, an Applicant is not required to propose any alternative routes but must disclose any other routes that were considered but rejected by the Applicant (Minn. Stat. § 216E.04, subd. 3). Further, an Environmental Impact Statement is not required under the Alternative Review Process. Instead, EERA is required to prepare an environmental assessment (EA) (Minn. Stat. § 216E.04, subd. 5). Unlike the full Route Permit process for higher voltage lines, a formal contested case hearing is not required (Minn. Stat. § 216E.04, subd. 6). The Alternative Review Process procedures are discussed below in **Section 2.2.1**.

[6] Minn. Stat. § 216B.2421, subd. 2(3) (2006).

The regulatory process described in this section is the process that is followed to satisfy all the requirements under the Alternative Review Process Route Permit rules. *See* Minn. R. Ch. 7850.

2.2.1 Notice of Application

In accordance with Minn. Stat. § 216E.04, subd. 4, and Minn. Stat. § 216E.03, subd. 4 within 15 days of filing this Application, Great River Energy will mail a notice of the filing to each owner whose property is along the Project's proposed route, to those persons who have registered their names with the Commission and expressed an interest in large energy projects, and to the tribal government and local government units (LGUs) whose jurisdictions are reasonably likely to be affected by the proposed Project. In addition, Great River Energy will publish notice in a local newspaper in each county where the Project is proposed that announces the filing of this Application. *See* Minn. Stat. § 216E.04, subd. 4; Minn. R. 7850.2100.

An electronic version of the Application will be available on eDockets in docket number 23-170 and on the EERA webpage. The Application will also be available on Great River Energy's transmission projects webpage at: https://greatriverenergy.com/transmission_project/cedar-lake-transmission-project/.

2.2.2 Environmental Review Process

Upon acceptance of an Application for a Route Permit as complete, EERA will conduct an environmental review of the Project, which requires preparation of an EA. *See* Minn. R. 7850.3700. The EA will contain information on the human and environmental impacts of the Project and addresses mitigation measures for all routes considered.

The process EERA must follow in preparing the EA is set forth in Minn. R. 7850.3700. This process requires EERA to schedule at least one scoping meeting and associated public comment period. The purpose of the meeting is to provide information about the Project and permitting process, answer questions, and gather input regarding potential impacts and mitigative measures that should be studied in the EA. The meeting also provides an opportunity to solicit potential route or route segment alternatives that mitigate impacts. Great River Energy, EERA, and the Commission will have representatives available during the public meeting to answer questions and provide information for the public. The public meeting will be held within 60 days after the Application is accepted and deemed complete.

Once the scoping meeting has been held and after the public comment period closes, the Commissioner of the DOC will issue a scoping decision describing the issues and alternatives that will be evaluated in the EA. EERA will prepare the EA based on the scoping decision. Upon completion of the EA, EERA will publish notice of its availability in the *EQB Monitor*, a weekly publication of the Minnesota Environmental Quality Board (EQB) that can be accessed on the EQB webpage, www.eqb.state.mn.us/monitor.html. DOC-EERA will also send notice to persons who have placed their names on the Project mailing list (**Section 1.6)**. A copy of the EA will be available electronically through eDockets and the EERA webpage. The EA will become part of the record for consideration by the Commission.

After the EA is issued, a public hearing and associated public comment period will be held to again solicit public input and to create an administrative record. The Commission will select a person to preside at the hearing, which, in practice, is usually an administrative law judge (ALJ) from the Office of Administrative Hearings. The Commission will establish the procedures to be followed at the hearing. *See* Minn. R. 7850.3800.

Once the hearing is concluded, the ALJ will prepare a report based on the record. After the report is issued, the matter will come to the Commission for a decision. During an open meeting, the Commission will deliberate and make a decision as to the route for the Project, using the criteria set forth in Minn. Stat. 216E.03, subdivision 7(b), and Minn. R. 7850.4100 to guide its decision.

A route permit under the Alternative Review Process shall be issued six months after the Commission's determination that the Application is complete. This timeframe may be extended up to three months for just cause or upon agreement by the Applicant. *See* Minn. Stat. § 216E.04, subd. 7.

2.3 Other Permits/Approvals

In addition to the Route Permit sought in this Application, several other permits, license, approvals, or consultations may be required to construct the Project depending on the actual route selected and the conditions encountered during construction. A list of the local, state, and federal permits that may be required for this Project is provided in **Table 2.3-1**. Each of these requirements and their applicability to the Project are discussed in the application sections as listed in the table. Any required permits will be obtained by Great River Energy in a timely manner.

Table 2.3-1. Summary of Possible Permits, Licenses, Approvals, and Consultations

Permit	Jurisdiction
Federal	
Section 404 Clean Water Act Permit	United States Army Corps of Engineers
Section 7 Endangered Species Act / Migratory Bird Treaty Act Consultation	United States Fish and Wildlife Service
Part 7460 Airport Obstruction Evaluation	Federal Aviation Administration / Minnesota Department of Transportation
State	
State Endangered Species Consultation	Minnesota Department of Natural Resources – Ecological Services
National Historic Preservation Act Consultation Minnesota Statutes Chapter 138 (Minnesota Field Archaeology Act and Minnesota Historic Sites Act)	State Historic Preservation Office Tribal Historic Preservation Officers
Licenses to Cross Public Waters	Minnesota Department of Natural Resources – Lands and Minerals
Water Appropriation General Permit – Construction Dewatering	Minnesota Department of Natural Resources
National Pollutant Discharge Elimination System Construction Stormwater Permit	Minnesota Pollution Control Agency
Section 401 Clean Water Act Water Quality Certification	Minnesota Pollution Control Agency
Wetland Conservation Act	Minnesota Board of Water and Soil Resources, Scott and Rice Counties Soil and Water Conservation Districts

Permit	Jurisdiction
Utility Accommodation on Trunk Highway ROW	Minnesota Department of Transportation
Miscellaneous Work Permit for Trunk Highways	Minnesota Department of Transportation
Oversize and/or Overweight Permit	Minnesota Department of Transportation
Local	
Road Crossing/Driveway/ROW Permits	Helena and Cedar Lake Townships, Scott County Wheatland Township, Rice County
Over-Width Load Permits	Helena and Cedar Lake Townships, Scott County Wheatland Township, Rice County
Other	
Crossing Permits/Agreements	Other utilities such as pipelines

2.3.1 Federal Approvals

Section 404 Permit Clean Water Act Permit

A Section 404 permit is required from the U.S. Army Corps of Engineers (USACE), St. Paul District for discharges of dredged or fill material into waters of the United States. Based on wetland mapping using Minnesota Department of Natural Resources (MDNR) National Wetland Inventory (NWI) data, the Project will cause minimal permanent and temporary impacts to wetlands and is anticipated to be eligible for coverage under the Minnesota Utility Regional General Permit. Great River Energy, in consultation with the USACE, St. Paul District, will seek coverage under the appropriate permit once design of the transmission line is complete. **Section 6.7.2** discusses the potential impacts to wetlands associated with the Proposed Route.

U.S. Fish and Wildlife Service Endangered Species Act and Migratory Bird Treaty Act

As discussed above, the Project is anticipated to result in impacts that are eligible for coverage under the USACE Section 404 Minnesota Utility Regional General Permit. Conditions of this permit require that Great River Energy assess whether the activity might affect any federally listed threatened, endangered, or proposed threatened and endangered species, designated critical habitat, or proposed critical habitat in compliance with the Endangered Species Act. Great River Energy will coordinate with the U.S. Fish and Wildlife Service (USFWS) once design of the transmission line is complete. **Section 6.7.5** discusses the potential impacts to federally listed threatened and endangered species associated with the Proposed Route.

The Migratory Bird Treaty Act prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS. Great River Energy will work with the USFWS to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of avian collisions once design of the transmission line is complete. **Section 6.7.3** discusses the potential impacts to migratory bird species associated with the Proposed Route.

Federal Aviation Administration Part 7460 Airport Obstruction Evaluation

Title 14 Code of Federal Regulations (CFR) Part 77 requires that anyone building a structure near an airport report their intentions to the Federal Aviation Administration (FAA). This requires a

submission of FAA Form 7460, at which point the FAA will conduct an Obstruction Evaluation / Airport Airspace Analysis Process.

2.3.2 State of Minnesota Approvals

State Endangered Species Consultation

Minn. Stat § 84.0895 prohibits the take, import, transport, or selling of any portion of an endangered species or wild animal or plant. In order to determine if a project will impact a state listed threatened or endangered species, an applicant must consult with the MDNR Natural Heritage and Nongame Research Program, which collects, manages, and interprets information about nongame species. The results of initial consultation regarding the Proposed Route are provided in **Section 6.7.5**.

Historic, Archaeological, and Tribal Cultural Resources

As discussed above, the Project is anticipated to result in impacts that are eligible for coverage under the USACE Section 404 Minnesota Utility Regional General Permit. Conditions of this permit require that Great River Energy assess whether the activity might have the potential to cause effects to an historic property, listed on, eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places.

The Minnesota Field Archaeology Act (Minn. Stat § 138.32-138.42) establishes the Office of the State Archaeologist (OSA); requires licenses to engage in archaeology on nonfederal public land; establishes ownership, custody, and use of objects and data recovered during survey; and requires state agencies to submit development plans to the OSA, Minnesota State Historic Preservation Office (SHPO), and the Minnesota Indian Affairs Council (MIAC) for review when there are known or suspected archaeological sites in the area.

Minnesota's Private Cemeteries Act (Minn. Stat § 307.08) affords all human burial grounds and remains older than 50 years and located outside of platted or identified cemeteries protection from unauthorized disturbance. This statute applies to burials on either public or private lands or waters and includes prehistoric Indian burial mounds as well as historic cemeteries.

License to Cross Public Waters

The MDNR Division of Lands and Minerals regulates utility crossings over, under, or across any State land or public water identified on the Public Waters and Wetlands Maps. A license to cross public waters is required under Minn. Stat. § 84.415 and Minn. R. Ch. 6135. As further discussed in **Section 6.7.2**, the Proposed Route crosses public water watercourses; therefore, a Utility License to Cross Public Waters will be required. No MDNR-administered public lands are crossed by the Proposed Route.

Water Appropriation General Permit – Construction Dewatering

Minn. Stat. § 103G.265 requires the MDNR to manage water resources to ensure an adequate supply to meet long-range seasonal requirements for domestic, agricultural, fish and wildlife,

recreational, power, navigation, and quality control purposes. A water use permit from the MDNR is required for all uses withdrawing more than 10,000 gallons of water per day or 1 million gallons per year. Construction dewatering activities are sometimes required during the installation of transmission poles, as further discussed under **Section 6.7.2**; therefore, a water appropriation permit may be required.

National Pollutant Discharge Elimination System Construction Stormwater General Permit

A National Pollutant Discharge Elimination System (NPDES) permit from the Minnesota Pollution Control Agency (MPCA) is required for stormwater discharges associated with construction activities disturbing one or more acres. A requirement of the permit is to develop and implement a stormwater pollution prevention plan (SWPPP), which includes Best Management Practices (BMPs) to minimize discharge of pollutants from the site. This permit will be acquired if construction of the Project will cause a disturbance of one or more acres.

Section 401 Water Quality Certification

A Section 401 certification is necessary to obtain a federal permit for a project to ensure that the federal government does not issue a permit or license for a project that will result in a violation of the state water quality standards set under the Clean Water Act in waters of the U.S. The federal agency, in this case the USACE, cannot issue a permit until the MPCA has either certified that the project impacting waters of the U.S. will comply with state water quality standards, or waived its review of the project. As discussed above, the Project is anticipated to result in impacts that are eligible for coverage under the USACE Section 404 Minnesota Utility Regional General Permit. The MPCA has issued a Section 401 Certification associated with the regional general permits.

Wetland Conservation Act

The Minnesota Board of Water and Soil Resources (BWSR) administers the state Wetland Conservation Act. The Project will cause minimal permanent and temporary impacts to wetlands and is anticipated to be eligible for the Exemption for Utilities in accordance with Minn. Stat. § 103G.2241, subd. 6, and Minn. R. 8420.0420, Subp. 5, which allows the utility exemption for installation, maintenance, repair, or replacement of lines if (a) the impacts have been avoided and minimized to the extent possible; and (b) the proposed project significantly modifies or alters less than one-half acre of wetlands. Further discussion on the potential impacts to wetlands associated with the Proposed Route are provided in **Section 6.7.2**.

Utility Accommodation on Trunk Highway Right of Way

A Utility Accommodation Permit is required by the Minnesota Department of Transportation (MnDOT) if utility lines will overhang or cross over a state highway or utility structures will be located within road ROW. The Project will parallel 280th St E / State Highway 19, likely cross over the highway, and may have structures located within its ROW. Great River Energy will apply for the permit once it has a final line design. Project construction work will not commence along the highway until the permit is issued. Great River Energy has started coordinating with the MnDOT, as documented in the correspondence provided in **Appendix D**.

Miscellaneous Work Permit for Trunk Highways

A Miscellaneous Work Permit is required by the MnDOT for placement of temporary obstructions on the ROW (e.g., survey vehicles) and vegetation removal. After the Route Permit is issued, Great River Energy will apply for this permit.

Oversize / Overweight

An Oversize and / or Overweight permit is required by MnDOT when a vehicle is transporting an oversize / overweight load on Minnesota roadways. If any transport load qualifies as oversize or overweight, the transportation contractor will apply for the appropriate permit.

2.3.3 Local Approvals

After the Commission approves a route and any appropriate design engineering is completed, Great River Energy will work with LGUs to obtain any of the following approvals, if necessary.

Road Crossing/Driveway/Right-of-Way Permits

These permits may be required to clear, cross, or occupy county, township, or city road ROW. Great River Energy will apply for these permits once the transmission line design is complete and acquire them prior to applicable construction activities.

Over-Width/Loads Permits

These permits may be required to move oversize or heavy loads on county, township, or city roads.

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3 PROPOSED PROJECT

3.1 Project Description

Great River Energy proposes to build a new 115-kV transmission line to supply power to the Cedar Lake Substation so that the existing 115-kV transmission line connected to the substation can be decommissioned and removed from the CapX2020 structures. The Project will be built to provide 115-kV service to the Cedar Lake Substation to meet long-term planning needs in the Project Area but will initially operate at 69-kV. Designing to 115-kV standards will simplify operation of the regional transmission system at 115-kV as electrification and load development increase in the area. The proposed Project is located in Helena and Cedar Lake Townships, east of the City of New Prague, in Scott County, and in Wheatland Township, in Rice County, Minnesota (**Figure 1-2).**

3.2 Transmission Line

Great River Energy proposes the Project follow an approximately 6.3-mile route starting from the Cedar Lake Substation to the connection point with Great River Energy's existing MV-EVX 115-kV transmission line following the Proposed Route described below. An overview of the Proposed Route is shown in **Figure 1-2,** Proposed Route widths are shown in **Figure 3-1,** and **Appendix A** contains a series of larger scale aerial photo maps depicting the Proposed Alignment, Proposed Route, and 100-foot-wide ROW for the Project.

Proposed Route

The Project will begin at Great River Energy's existing Cedar Lake Substation located approximately 1,000 feet south of 260th St W in Helena Township in Scott County. The Project Route will extend east from the Cedar Lake Substation through agricultural fields and forested areas to Baseline Avenue **(page 1 of Appendix A)**. From there, it will continue to follow Baseline Avenue until 270th St W to Baseline Avenue's termination point. The Project Route will continue south for approximately 1,300 feet to a landowner property boundary, where it will turn east for approximately 600 feet to the eastern edge of the landowner property boundary. The Project Route will then continue south for approximately 2,650 feet to 280th St E / State Highway 19 and then turn east (**page 2 of Appendix A**). It will continue along 280th St E / State Highway 19 for approximately 4 miles until it intersects with Great River Energy's existing MV-EVX 115-kV line near Panama Ave / County Highway 23 (**pages 2 and 3 of Appendix A**).

Right-of-Way and Route Widths

New easements will be needed for the 115-kV transmission line. Great River Energy representatives will work directly with individual landowners to acquire the necessary easements for the Project. At a minimum, the Project will require a total ROW width of 100 feet (typically 50 feet off each side of the transmission centerline) for the 115-KV transmission line system.

Great River Energy is requesting varied route widths for specific portions of the route to take into account existing infrastructure, mitigate potential engineering challenges, and/or to facilitate any necessary realignments to accommodate agency and/or landowner requests. The route width areas are shown in **Figure 3-1** and numbered consistent with the descriptions below. Detailed descriptions of each route width area and the requested widths are as follows:

Great River Energy's requested route widths are depicted in **Figure 3-1.** For much of the Proposed Route, Great River Energy is requesting a route width of 400 feet; in certain areas, Great River Energy is requesting a different route width. Those areas are identified below and shown in more detail in the maps provided in **Appendix A**:

1. The entire parcel upon which the substation is located (approximately 73 acres) (**page 1 of Appendix A**).

2. A 250-foot-wide route south of Baseline Avenue for approximately 500 feet to avoid a residence to the southwest of Baseline Avenue (**page 2 of Appendix A**).

3. A 565-foot-wide route at the intersection of 280th St E / State Highway 19 and Langford Ave / State Highway 13, which extends approximately 1,000 feet. This route width is requested to accommodate the intersection of State Highway 19 and State Highway 13 (**page 2 of Appendix A**).

4. A 435-foot-wide route at the intersection of 280th St E / State Highway 19 and Panama Ave / County Highway 23, which extends approximately 850 feet until the connection with Great River Energy's existing MV-EVX 115-kV transmission line. This route width is requested to accommodate the intersection of State Highway 19 and County Highway 23 (**page 3 of Appendix A**).

Structures and Design Considerations

Potential structure designs and photographs are provided in **Diagrams 3-1** and **3-2**. Structure dimensions are provided in **Table 3.2-1**.

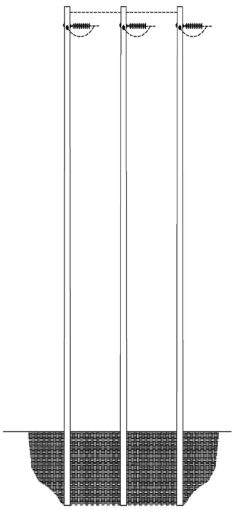
Table 3.2-1. Typical 115-kV Structure Dimensions

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	60 - 90	18 - 36	300 - 400
H-Frame	Wood, steel, or ductile iron	60 - 90	18 - 36	350 - 800
Three-pole	Wood, steel, or ductile iron	60 - 90	18 - 36	350 - 800

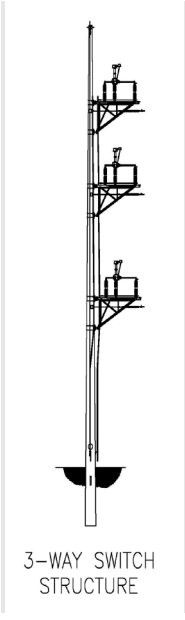
Diagram 3-1. Typical Transmission Structure Types

SINGLE CIRCUIT
HORIZONTAL POST

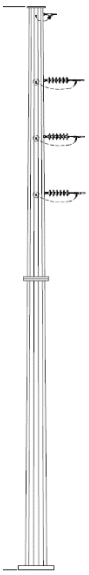
SINGLE CIRCUIT
BRACED POST



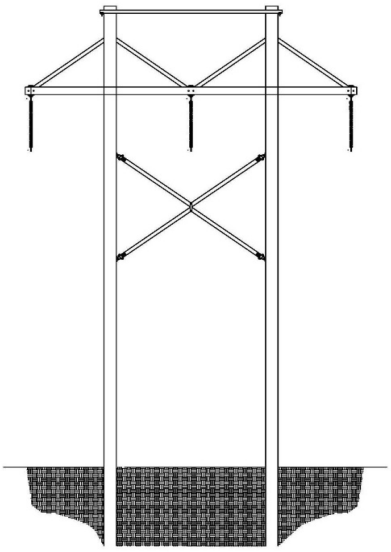
SINGLE CIRCUIT
3-POLE DEADEND



3-WAY SWITCH
STRUCTURE

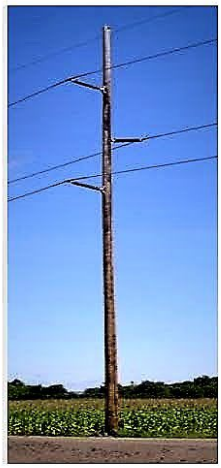


LAMINATE POLE
DEADEND



SINGLE CIRCUIT
H-FRAME

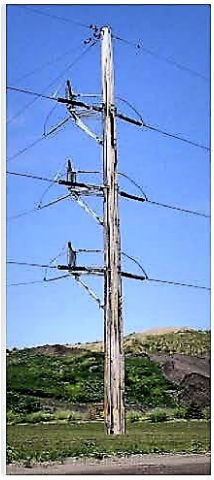
Diagram 3-2. Photos of Typical 115 kV Transmission Structures



Single Circuit

Braced Post

3-Pole Deadend



Switch

Steel Deadend

H-Frame

The majority of the new 115-kV transmission line will consist of single circuit, horizontal post, or braced post monopole wood structures spaced approximately 300 to 400 feet apart. Transmission structures will typically range in height from 60 to 90 feet above ground, depending upon the terrain and environmental constraints. The average diameter of the wood structures at ground level is 20 inches.

Laminated wood structures or steel structures may be needed for switches and angled structures; the size of these structures is dependent on the weight of the switch material, the tension on the line, and/or the angle of deflection the pole location causes on the transmission line. Specific sizing

of these structures will be determined after a route permit is issued and detailed engineering design is initiated.

Multi-pole (e.g., 3-pole deadend) and/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 upgraded 115-kV 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 (NESC). Specific sizing of these structures will be determined after a Route Permit is issued and detailed engineering design is initiated. Great River Energy does not currently anticipate the Proposed Route will require H-frame or 3-pole structures.

A deadend structure is used to change direction and / or wire tension on a transmission line. Deadend 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. Deadend structures can use wood, wood laminate, direct steel embedded, or steel on concrete foundation structures.

Transmission Line Clearance Requirements

NESC sets minimum clearances of the conductors from structures adjacent to or within the ROW. NESC clearance requirements are summarized in **Table 3.2-2**. For a 115-kV transmission line like the Project, the NESC minimum clearance under a 48 mile per hour (mph) wind is 8.6 feet. When there is no wind, the conductors must have a clearance of 9.1 to 11.6 feet from various structures as listed in **Table 3.2-2**. In addition, Great River Energy 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 eight feet with 94 mph winds.[7] The final line design evaluates blowout based on actual span distances and the type of conductor being used.

Table 3.2-2. NESC Clearance Requirements for 115-kV

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

[7] NESC also has standards regarding vegetation management which necessitates typically greater clearance distances. See **Section 5.7** for vegetation management requirements.

Substation

The Cedar Lake Substation is already equipped with breakers and relays. This equipment is designed to protect human health, as well as all of the equipment on the transmission system, by de-energizing the transmission line should any unsafe line faults occur. No modifications are anticipated other than to connect the new transmission line to the substation.

Outages

All necessary outages are coordinated in accordance with MISO requirements and procedures that are established and followed by all MISO members to meet personnel safety and NESC transmission grid reliability requirements. Coordination is accomplished through well-defined outage scheduling procedures that utilize web-based tools, 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 and transmission grid reliability. While distribution systems are not subject to MISO requirements, Great River Energy will also coordinate outages with Minnesota Valley.

Conductors

The single circuit structures will have three single conductor phase wires and one shield wire. It is anticipated that the phase wires will be 795 thousand circular mil aluminum conductor steel reinforced (795 ASCR) or a conductor with similar capacity. The shield wire will be 0.528 optical ground wire.

Distribution Lines

Great River Energy does not own, operate, or install low voltage distribution lines. On some projects, Great River Energy has allowed other distribution utilities to attach distribution lines to its high voltage transmission line structures. This is commonly called "underbuild" or "underbuilt." Minnesota Valley has existing distribution lines along Baseline Avenue and 280th St E / Minnesota Highway 19. Great River Energy currently understands that Minnesota Valley plans to bury these lines where they are overtaken by the Project, rather than attach them to the new 115-kV structures installed by Great River Energy. This work will be undertaken by Minnesota Valley and will not be conducted or directed by Great River Energy.

Service Life

The service life of a transmission line is approximately 40 years, although based on experience, it is quite possible that the line and structures will last longer than 40 years.

Annual Availability

An average 115-kV transmission line is expected to be available approximately 99.9 percent of the year. Great River Energy expects that this line should not be out of service for any extended period

of time, other than the rare times when scheduled maintenance is required or when a natural event, such as a tornado, thunderstorm, or ice storm causes an outage.

3.3 Proposed Ownership

Great River Energy will own the 6.3-mile 115-kV transmission line from the Cedar Lake Substation to its connection point with the MV-EVX 115-kV line.

3.4 Landowner Coordination

Great River Energy has initiated landowner outreach by providing information on the Project via letters mailed to potentially impacted landowners, interested parties and federal, state, and local governmental officials; publishing notices in area newspapers; and holding an Open House meeting (**Section 1.6, Appendix B**).

The majority of the Proposed Route is owned by private landowners. New easements will be needed for the 115-kV transmission line route from the substation to connect the Project to the existing MV-EVX 115-kV line. Great River Energy representatives will work directly with individual landowners to negotiate the necessary easements. At a minimum, the Project will obtain a total ROW of 100 feet (typically 50 feet from each side of the transmission centerline) for the 115-KV transmission line system. Where the transmission line parallels roads, the transmission line structures are typically installed one to five feet outside of road ROW, resulting in approximately 55 feet of ROW needed outside of the road ROW.

If a negotiated easement cannot be reached, Great River Energy can use the eminent domain process to obtain the rights necessary. *See* Minn. Stat. § 216E.12. With the eminent domain process, the landowner has the ability to have compensation for the ROW determined by impartial commissioners through a court process that is initiated by Great River Energy.

3.5 Estimated Costs

Estimated costs for the proposed Project are approximately $10.4 million. Costs and tasks are divided into six phases as summarized in **Table 3.5-1**.

Table 3.5-1. Estimated Great River Energy Project Costs

Project	Planning/State Permitting	Land Acquisition/ Permits	Design	Procurement	Construction	Close Out	Total
Transmission Line	$386,378	$2,840,303	$507,551	$3,018,234	$2,958,647	$156,635	**$9,867,748**
Switches	$16,248	$3,271	$126,680	$214,377	$178,515	$13,212	**$552,303**
Total	**$402,626**	**$2,843,574**	**$634,231**	**$3,232,611**	**$3,137,162**	**$169,847**	**$10,420,051**

All capital costs for the Project will be borne by Great River Energy.

3.5.1 Transmission Line Construction Costs

In rural areas, single pole construction costs and easement costs are approximately $725,000 per mile (2021). The proposed Project's costs are anticipated to be higher due to congestion from existing roads, the need to cross roads numerous times to avoid existing homes, escalating material costs and the compressed timeline for the Project.

3.5.2 Operation and Maintenance Costs

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

3.6 Project Schedule

Great River Energy plans to commence construction of the Project in fall 2024 once required permits and approvals are obtained. Great River Energy anticipates construction will take approximately seven to eight months and the Project will be energized in summer 2025. **Table 3.6-1** summarizes the permitting schedule that would enable the Project to be in service in time for CapX2020 to install the second circuit.

Table 3.6-1. Anticipated Permitting Schedule

Route permit application filed	June 2023
Scoping meeting	August 2023
Public hearing	November 2023
Commission meeting	February 2024
Written order issued	March 2024

3.7 Work Force Required

Great River Energy anticipates 15 to 25 daily contract workers will be employed during construction of the Project. Great River Energy will also have a construction supervisor onsite throughout the construction phase.

Great River Energy has a buy local policy that states, "preference shall be given to local suppliers. Local suppliers are those suppliers or contractors who are physically located in Great River Energy's service territory (Minnesota / Wisconsin) and/or in states where Great River Energy has a physical location (North Dakota). Great River Energy's operating guideline, in order of importance, is to buy Local → Domestic → Eligible Countries. Sources from non-eligible countries will be considered in extreme circumstances or as a last resort."

Great River Energy typically hires contractors who pay their employees at or better than prevailing wages.

3.8 Construction Practices

Great River Energy intends to employ its standard practices to construct the Project. These standard practices have been established and incorporate BMPs to meet internal, state, and federal requirements, balance construction costs, and minimize impacts to landowners and the environment. Construction practices to be followed are described in more detail in **Section 5.5**.

3.9 Operation and Maintenance Practices

Great River Energy will periodically perform inspections, maintain equipment, and repair damage to the transmission line. Regular maintenance and inspections will be performed over the life of the facility to ensure a reliable system. Annual inspections will be done by foot, snowmobile, All-Terrain Vehicle, pickup truck, or by aerial means. These inspections will be 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 problems with the transmission line are found during inspection, repairs will be performed, and landowners will be compensated for any losses or damages incurred to their property.

Great River Energy's Transmission Construction & Maintenance Department will conduct vegetation surveys and remove vegetation that will interfere with the safe operation of the transmission line (**Section 5.7**). A three to seven-year cycle of vegetation maintenance is desirable. ROW practices include a combination of mechanical and hand clearing, along with targeted application of herbicides where allowed.

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4 ALTERNATIVE ROUTES CONSIDERED AND REJECTED

4.1 Alternative Requirement

Minn. Stat. § 216E.04, subdivision 3, and Minn. R. 7850.3100 require an applicant to identify any alternative routes that were considered and rejected for the Project.

The first step in identifying route alternatives is to identify local, existing transmission lines and then determine if the line can sufficiently support the needs of the Project. That process identified: 1) Great River Energy's existing 115-kV MV-EVX line, which currently powers the Cedar Lake Substation and is located east of the substation and, 2) Xcel Energy's existing 69-kV 0744 line, which is located west and south of the substation. As described in **Section 4.2**, the Xcel Energy 69-kV 0744 line was determined to a non-viable alternative. As described in **Sections 4.3** and **4.4**, five route alternatives that would connect to the 115-kV MV-EVX were considered. Four of those route alternatives were ultimately rejected in favor of the Proposed Route because the Project's Proposed Route better avoids and minimizes potential human and environmental impacts, consistent with the Commission's routing criteria.

4.2 Evaluation of Xcel Energy's 69-kV 0744 Line

Connection to the Xcel Energy 69-kV 0744 transmission line was considered and rejected (**Figure 1-3**). As such, no actual routes were evaluated in detail. Using the 69-kV line to power the Cedar Lake Substation was rejected for the following reasons:

- The Xcel Energy 69-kV 0744 connection point is an older transmission system that is less reliable than other 115-kV connection points available in the area. This 69-kV transmission line has an exposure length of 22 miles in comparison to about 13 miles of exposure on the preferred Great River Energy 115-kV connection point. Higher transmission line exposure lengths mean increased risk of outages due to contact, weather, etc.

- Interconnecting the Cedar Lake Substation to Xcel Energy's 69-kV 0744 line would cause post-contingent transmission line loading and low voltage concerns to the system that would make this option inferior to connecting to Great River Energy's 115-kV MV-EVX line. Specifically, for the loss of Scott County-Gifford Lake 69-kV line, Great River Energy's 69-kV line between the Carver County and Assumption substations would be loaded to about 93% of the line's capacity and the Gifford Lake area would experience weak voltage profile. This would speed up the need to rebuild the Carver County to Assumption 69-kV line for additional capacity. Further, with weak voltage profile and post-contingency loading of 93% on the Carver County to Assumption 69-kV line, there would be minimal capacity available to accommodate future increased energy needs in the area. This would likely result in a new, separate upgrade project sometime in the future.

4.3 Following the Existing CapX2020 Brookings to Hampton Line

Connecting to the 115-kV MV-EVX line following the CapX2020 alignment was rejected for the following reasons:

- Staying within the same alignment and ROW for the CapX2020 line would require constructing triple circuit structures, which would likely require shorter spans than the existing structures. Replacing the existing 4.2-mile segment with triple circuit structures would require a lengthy outage on the existing 345-kV circuit, which is already experiencing congestion that has resulted in curtailment of renewable energy sources. This alternative is rejected because it does not meet the Project schedule.

- A separate 115-kV transmission line could be constructed parallel to the existing CapX2020 line, but it would need to be offset and would require an additional 50 to 75 feet of ROW, further directly impacting residential and agricultural properties already impacted by the CapX2020 line. To avoid induction issues on the new 115-kV line, construction would also require a lengthy outage of the CapX2020 345-kV circuit, which is already experiencing congestion that has resulted in curtailment of renewable energy sources.

- A separate 115-kV line could be constructed on the opposite side of the road from the CapX2020 line. However, this configuration would require impacts to properties that were potentially originally intentionally avoided by the CapX2020 line. This alternative would also include numerous road crossings where the new line would have to cross under the existing CapX2020 lines. Each crossing would require two H-frame or 3-pole structures increasing visual impacts.

Due to the direct impact to landowners, the constructability issues, and construction timelines described above, following the CapX2020 line was eliminated from further consideration.

4.4 Alternative Routes to Connect to the Proposed 115-kV EV-EVX Line

Great River Energy considered three Route Alternatives that would include the installation of a 115-kV transmission line from the Cedar Lake Substation and have a connection point east of that substation, at the MV-EVX 115-kV line (**Figure 4-1**). Route Alternatives 1, 2, and 3 (RA1, RA2 and RA3) are approximately the same length (6.0-6.4 miles) as the Proposed Route.

Great River Energy reviewed major publicly available environmental datasets to complete a high-level comparative analysis of the Proposed Route and RA1, RA2, and RA3 depicted in **Figure 4-1**. A summary of the results is presented in **Table 4.4-1**. To provide a reasonable comparison between the Proposed Route and Route Alternatives, resource impacts were assessed based on the route width, route alignment, and/or a 100-foot-wide buffer (50 feet either side) of the centerlines (i.e., ROW), as appropriate depending on the resource.

Because the Proposed Route and the route alternatives evaluated traverse relatively the same geography and terrain, potential human and environmental impacts are similar across the route alternatives. Ultimately, Great River Energy is requesting a Route Permit for the Proposed Route because, as compared to the route alternatives considered and rejected, the Proposed Route best

balances the Commission's routing criteria because of its collocation with existing infrastructure and greater distance from existing residences. Further, impacts to resources such as forested areas and wetland features can be avoided or reduced during final design through modification of the Route Alignment and pole placement within the selected route width. For example, wetlands less than 400 feet in length can be spanned, thereby avoiding pole placement within the wetland feature.

As summarized in **Table 4.4-1**, in terms of human and environmental impacts, the Proposed Route:

- is collocated for 47.3% of its length with utilities (i.e., electric transmission and distribution lines, and / or oil pipelines) and roads, more than any of the other Route Alternatives; and

- has the least number of homes within 200 feet of the proposed centerline.

The Route Alternatives are compared in further detail to the Proposed Route below. In particular, Great River Energy notes that RA3 is located parallel to utilities and roads along the entirety of its route width; however, due to the congestion of existing infrastructure in particular along Langford Ave / State Highway 13, MnDOT ROW width along this highway, and topography, Great River Energy would have to route the transmission line approximately 100 to 150 feet outside of the road footprint. As such, although RA3 would technically run parallel to existing infrastructure, Great River Energy determined that paralleling existing infrastructure would not, in this instance, reduce human and environmental impacts.

Table 4.4-1. Comparison of Human and Environmental Features Crossed by the Proposed Route and Route Alternatives

Resource / Characteristic	Proposed Route	RA1	RA2	RA3	Source
Length (miles)	6.3	6.0	6.4	6.3	N/A
Collocation[a] with Utilities and Roads					
Electric Transmission / Distribution Lines (feet)	12,398	100	12,384	5,608	Minnesota Valley Distribution Lines (personal communication, February 2023); https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mngeo/util_elec_trans/metadata/metadata.html (2021)
Oil and Gas Pipelines (feet)	1,160	685	581	2,866	Proprietary information
Roads (feet)	2,163	2,584	2,196	2,857	https://mndot.maps.arcgis.com/apps/View/index.html?appid=ed7c29124e56472cbfba2d0cc3c557e2 (Undated)
Total (feet) [b]	**15,721**	**3,369**	**15,161**	**11,331**	
Percent Collocated [b]	**47.3%**	**10.6%**	**44.9%**	**34.1%**	
Land Use Features					
Residences within 200 feet of centerline	1	4	2	3	Digitized from aerial photographs (2021)

Resource / Characteristic	Proposed Route	RA1	RA2	RA3	Source
No. of parcels crossed by centerline	32	27	29	31	https://www.mngeo.state.mn.us/chouse/land_own_property.html (April 2023)
Collocation[a] with snowmobile trails (feet)	509	100	941	0	Le Sueur County Snowmobile Trails (Undated) Rice County Snowmobile Trails Map (Undated) Scott-Carver Snowmobile Trails Map (2016-2017) https://gisdata.mn.gov/dataset/trans-snowmobile-trails-mn (July 2022)
Easements					
U.S. Fish and Wildlife Service (USFWS) Interest (no.)	1	0	1	1	https://gis-fws.opendata.arcgis.com/datasets/fws::fws-national-realty-tracts/about (February 2023)
Minnesota BWSR / RIM Conservation Easement (no.)	0	1	1	0	https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements (April 2023)
Cultural and Historic Resources					
Memorial Highways (no.)	1	0	1	1	https://gisdata.mn.gov/dataset/trans-memorial-routes (Undated)
Architectural History Site (no.)	1	0	1	1	https://www.nps.gov/subjects/nationalregister/data-downloads.htm (May 2014)
Surface Water Features					
National Wetlands Inventory (no. of crossings)	23	22	24	24	https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014 (May 2019)
Waterbodies / Ditches (no. of crossings)	4	4	5	4	https://gisdata.mn.gov/dataset/water-dnr-hydrography (April 2023) https://prd-tnm.s3.amazonaws.com/index.html?prefix=StagedProducts/Hydrography/NHD/State/GDB/ (April 2023)
MDNR Public Water Watercourses (no. of crossings)	2	3	3	3	https://gisdata.mn.gov/dataset/water-mn-public-waters (June 2020)
Rare and Sensitive Resources					
Potential for USFWS federally protected species	3	3	3	3	Information for Planning and Consultation (IPaC) System Project Code 2023-0051696 (March 3, 2023)

Resource / Characteristic	Proposed Route	RA1	RA2	RA3	Source
Rusty Patch Bumblebee Low Potential Zones (no.)	0	1	0	0	https://www.arcgis.com/apps/mapviewer/index.html?webmap=2716d871f88042a2a56b8001a1f1acae (March 8, 2023)
Minnesota Biological Survey Sites of Biodiversity Significance (no.)	0	1	0	0	https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity (April 2023)
Minnesota Land Cover Classification System Regional Ecological Corridors (no.)	0	1	1	1	https://gisdata.mn.gov/dataset/env-mlccs-regional-corr-areas (2008)
MDNR Regionally Sig. Ecological Areas (no.)	1	1	1	0	https://gisdata.mn.gov/dataset/env-dnr-r3-resource-sig-areas (2000)

Notes:
[a] Collocation is defined as any utility, road or trail located within 50 feet either side of the centerline based on the proposed clearing width.
[b] Total length includes areas where more than one utility or road may be collocated with a centerline. For example, where a route is parallel of both an electric distribution line and a road.

The Proposed Alignment has the fewest residences within 200 feet (one residence), does not cross any Minnesota BWSR Reinvest in Minnesota (RIM) conservation easements, and has fewer public watercourse crossings relative to the other alignments associated with the Route Alternatives. The Proposed Alignment would be collocated for approximately 509 feet with local snowmobile trails, principally with a trail that extends from St. Patrick's Tavern and Restaurant near Cedar Lake in Scott County south to 263rd St E and then west on 263rd St E to Baseline Ave south into Rice County. Based on local county snowmobile trail maps, the alignments associated with RA1 and RA2 are also collocated with 100 and 941 feet of local snowmobile trails, respectively.

Similarly, the Proposed Alignment crosses approximately 0.4 mile of natural land use, including both upland and wetland forested areas, relative to the alignments associated with the other Route Alternatives that cross between 0.4 and 0.9 mile, as presented in **Table 4.4-2**. All remaining mileage crossed is developed/disturbed or agricultural.

Table 4.4-2. Comparison of Land Use Types Crossed by the Proposed Alignment and Route Alternative Alignments

Land Use Type	Proposed Route	RA1	RA2	RA3
	Miles Crossed			
Row & Close Grain Crop Cultural Formation	3.18	3.74	2.99	3.88
Pasture & Hay Field Crop	0.06	0.40	0.06	0.20

Land Use Type	Proposed Route	RA1	RA2	RA3
	Miles Crossed			
Agricultural Land Use Subtotals	*3.2*	*4.1*	*3.1*	*4.1*
Developed & Urban	2.58	0.98	2.80	1.79
Recently Disturbed or Modified	0.06	0.02	0.00	0.00
Developed / Disturbed Land Use Subtotals	*2.6*	*1.0*	*2.8*	*1.8*
Eastern Northern American Freshwater Marsh	0.09	0.06	0.08	0.08
North-Central Beech – Maple – Basswood Forest	0.31	0.75	0.47	0.23
North-Central Oak – Hickory Forest & Woodland	0.02	0.02	<0.01	0.00
Northern & Central Native Ruderal Forest	0.00	0.00	0.00	0.05
Silver Maple – Green Ash – Sycamore Floodplain Forest	0.00	0.02	0.04	0.02
Natural Land Use Subtotals	*0.4*	*0.9*	*0.6*	*0.4*
Total	**6.3**	**6.0**	**6.4**	**6.3**
Source: https://www.usgs.gov/programs/gap-analysis-project/science/land-cover-data-download (2011)				

As shown in **Table 4.4-3**, based on the NWI data the Proposed Route crosses the largest mileage of wetlands (1.5 miles); however, approximately 1.1 miles of those wetlands are classified as emergent wetlands, which would not require tree clearing during construction or operations. Permanent wetland impacts for the Proposed Route and all Route Alternatives can be further avoided or minimized through careful selection of pole locations. As shown in **Table 4.4-3**, there are few wetland crossings greater than 400 feet along the Proposed Alignment and Route Alternatives that would likely require pole placement within the wetland feature.

Table 4.4-3. Comparison of Wetlands Crossed by the Proposed Alignment and Route Alternative Alignments

Wetland Type	Proposed Route	RA1	RA2	RA3
	Miles Crossed			
Freshwater Emergent Wetland	1.09	0.88	1.03	0.74
Freshwater Forested Wetland	0.29	0.06	0.13	0.21
Freshwater Forested / Emergent Wetland	0.00	0.08	0.08	0.00
Freshwater Scrub-Shrub Wetland	0.12	0.00	0.14	0.14
Riverine	<0.01	0.01	0.01	0.01
Total	**1.5**	**1.0**	**1.4**	**1.1**
Wetland Crossings that Exceed 400 Feet	6	6	8	4
Source: https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014 (May 2019)				

5 ENGINEERING, OPERATIONAL DESIGN, CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION

Design and construction of transmission lines occur through multiple stages including identification of existing ROWs; transmission line design; ROW acquisition; construction; restoration; and operation and maintenance. Each stage is discussed in further detail in the sections that follow.

5.1 Transmission Structure Design and Right-of-Way Requirements

Transmission structure design and the ROW requirements are discussed in **Section 3.2**. A schematic and photos of typical structures are provided in **Diagrams 3-1 and 3-2**.

5.2 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. The Project is designed to maintain reliability requirements in the area and, because it is proposed at 115 kV, it is sized to accommodate future expansion to the extent that future analysis determines it to be needed. As such, the Project is designed to appropriately accommodate future expansion, when needed.

5.3 Identification of Existing Utility and Public Rights-of-Way

The Project will be constructed within existing utility ROW and will parallel existing road ROW for approximately 79 percent of the Proposed Alignment. Specifically, the Project:

- Is collocated[8] with Minnesota Pipeline Company pipeline ROW for approximately 1,160 feet between the Cedar Lake Substation and Baseline Avenue.
- Will parallel Baseline Avenue south for approximately one mile; for the last 0.25 mile, the Proposed Alignment would be located on the east side of Baseline Avenue within the existing Minnesota Valley distribution line ROW.
- Will parallel 280th St E / State Highway 19 for the last four miles of the Proposed Route. The Proposed Alignment would be located on the south side of the road for approximately two miles within the existing Minnesota Valley distribution line ROW.

5.4 Transmission Line Right-of-Way Acquisition Procedures

Great River Energy representatives will work directly with individual landowners to acquire the necessary easements for the Project. At a minimum, the Project will obtain a total ROW of 100

[8] Collocation is defined as any road or utility located within 50 feet either side of the Proposed Alignment based on the proposed clearing width.

feet (typically 50 feet of each side of the transmission centerline) for the 115-kV transmission line system. Great River Energy will continue to engage with landowners throughout the permitting process to answer any questions they may have regarding the easement process or the Project.

During formal land rights acquisition, Great River Energy will provide the landowners the transmission line easement, offer of compensation, information on the Project schedule, construction practices, vegetation removal, and damage settlement. Additional information may also be given to each landowner regarding preliminary pole placement (if available at that time), structure design or photos, and power line safety. Great River Energy would respond to any comments or questions landowner may have including those with respect to the transmission line construction practices or operations of the transmission line.

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.

As part of early transmission design work, Great River Energy will need to complete preliminary survey work and may need to acquire some soil characteristics data. Great River Energy will notify landowners in the event site access for soil boring is required to determine soil suitability in areas where special transmission structure design may be required.[9]

5.5 Construction Procedures

As described further below, construction will follow Great River Energy's standard construction and mitigation best practices. Construction typically occurs as follows:

- surveying and staking the ROW;
- ROW clearing and preparation;
- grading / filling, as needed;
- installation of foundations;
- installation of poles and related equipment;
- conductor stringing; and
- installation of any required aerial markers.

Procedures to be used for construction of the transmission line are discussed below. Equipment used in the transmission line construction process includes backhoes, cranes, boom trucks, and assorted small vehicles.

Transmission Line Construction

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

[9] Survey work and geotechnical studies do not require that the Commission issue a route permit for this work to occur. Minn. R. 7850.1200, subp. 5.

The first phase of the transmission line construction activities will involve survey staking of the transmission line centerline and / or pole locations, followed by removal of trees and other vegetation from the ROW. The width of the ROW will be cleared of vegetation for construction to ensure safe and reliable access and construction; during Project operations and maintenance, Great River Energy will implement wire / border zone vegetation management practices, as discussed further in **Section 5.7**.

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

Where clearing is required in wetlands, no more than one inch of chips, shred, or mulch will be allowed in wetlands. Larger trees and shrubs will be moved outside of the wetlands for processing in upland areas to ensure no more than one inch of residue is left in wetlands. Clearing in wetlands will be conducted when the ground and wetlands are frozen, or mats will be used to minimize impacts to vegetation.

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

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

If temporary removal or relocation of fences is necessary, installation of temporary or permanent gates will be coordinated with the landowner. Depending on the timing of construction, Great River Energy may work with the property owner for early harvest of crops, where possible, with compensation to be paid for any actual crop losses. During the construction process, it may be necessary for the property owner to remove or relocate equipment and livestock from the ROW. Compensation related to these activities will be discussed with the landowner during easement negotiations.

Transmission line structures are generally designed for installation at existing grades. Therefore, structure sites will 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.

Great River Energy will employ standard construction and mitigation practices as well as industry specific BMPs. BMPs address ROW clearing, erecting transmission line structures, and stringing transmission lines. BMPs for each specific project are based on the proposed schedules for activities, prohibitions, maintenance guidelines, inspection procedures, and other practices. In some cases, these activities, such as schedules, are modified to incorporate BMP installation that will assist in minimizing impacts to sensitive environments. Any contractors involved in construction of the transmission line will adhere to these BMP requirements.

A majority of the proposed structures will be installed directly in the ground by augering a hole typically 10 to 15 feet deep and 2 to 4 feet in diameter for each pole. Any excess soil from the excavation will be spread and leveled near the structure or removed from the site if requested by the property owner or regulatory agency. Some of the proposed structures will be steel poles, which may be directly imbedded or set on a concrete foundation. The concrete foundations will be approximately 5 to 7 feet in diameter and generally are exposed one foot above the existing ground level. Concrete trucks will be used to bring the concrete in from a local concrete batch plant.

After a direct-imbedded pole is set into the hole, the void space will be backfilled with crushed rock. Based on typical soil types in Minnesota, it is anticipated that the 60 to 90 foot above ground poles will be buried approximately 13 feet into the ground. In poor soil conditions (e.g., peat, marl, soft clay, loose sand) a galvanized steel culvert is sometimes installed vertically with the structure set inside.

After a number of proposed structures have been erected, Great River Energy will begin to install the shield wire and conductors by establishing stringing setup areas within the permanent ROW or temporary ROW as negotiated with the landowner. These stringing setup areas will be located at deadend structures along the Project Route 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. Conductor stringing operations require brief access to each structure to secure the conductor wire and shield wire once the final sag is established. Temporary guard or clearance structures will be installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways, or other obstructions after any necessary notifications are made or permits obtained. This will ensure that conductors will not obstruct traffic or contact existing energized conductors or other cables. In addition, the conductors will be protected from damage.

All construction will be completed in accordance with state, NESC, and Great River Energy construction standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, erection of power poles, and stringing of transmission line conductors.

5.6 Restoration Procedures

Disturbed areas will be restored to their original condition to the maximum extent practicable, or as negotiated with the landowner.

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

Great River Energy will contact landowners after construction is complete to determine if the clean-up measures have been to their satisfaction and if any other damage may have occurred. If damage has occurred to crops, fences, or the property, Great River Energy will compensate the

landowner. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition.

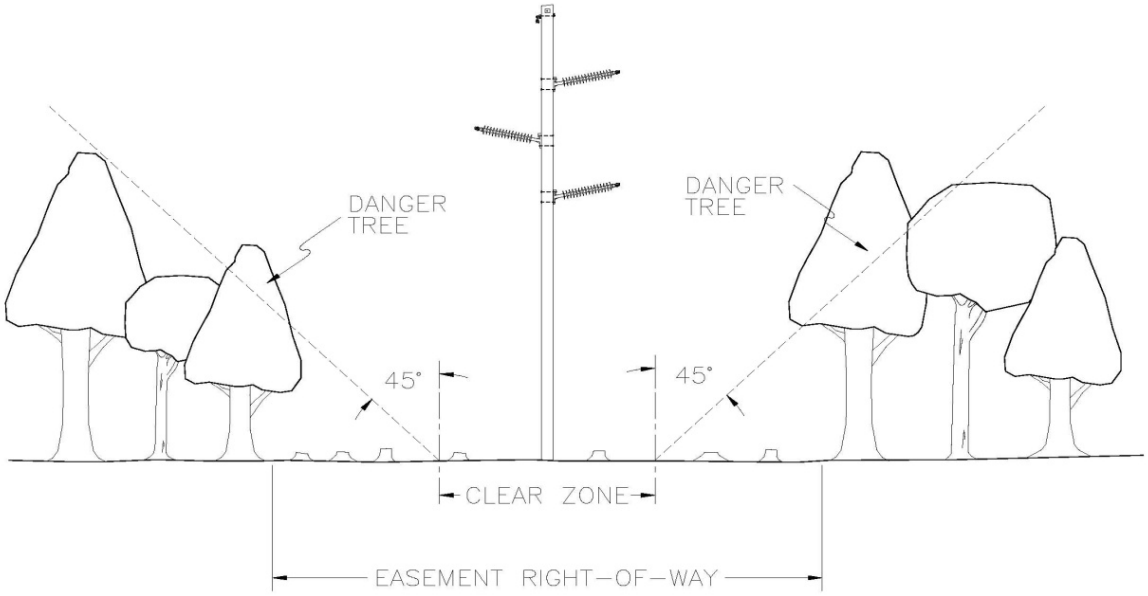
5.7 Operation and Maintenance

Access to the ROW of a completed transmission line is required to perform periodic inspections, conduct maintenance, and repair damage. Regular maintenance and inspections will be performed during the life of the transmission line to ensure its continued integrity. Generally, Great River Energy will inspect the condition of the transmission line and structures once per year. Inspections will be limited to the ROW and to areas where off-ROW access is required due to ROW obstructions or terrain impediments. If problems are found during inspection, repairs will be performed, and property restoration will occur, or the landowner will be provided reasonable compensation for any damage to the property.

The ROW will be managed to remove vegetation that interferes with the operation and maintenance of the transmission line. Shrubs that will not interfere with the safe operation or accessing and traversing the ROW of the transmission line will be allowed to reestablish in the ROW. Great River Energy will use an integrated vegetation management plan that incorporates a wire / border zone practice for ROW clearing and maintenance. As a general practice, low-growing brush, or tree species will be 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 will be removed. In developed areas and to the extent practical, existing low-growing vegetation that will not pose a threat to the transmission facility or impede construction or maintenance may remain in the border zone, as agreed to during easement negotiations. The area below the outer conductors plus 10 to 15 feet (e.g., the "wire zone" or "clear zone") will 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.

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 **Diagram 5-1**, if allowed by the terms in the easement. Danger trees generally are those that are dead, diseased, weak, or leaning towards the energized conductors. Tree trimming may be possible to minimize tree removal based on negotiations with individual landowners.

Diagram 5-1. Standard Tree Removal Practices during Transmission Line Operations



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

The estimated annual cost of ROW maintenance and operation and maintenance of Great River Energy's transmission lines (69 kV to 500 kV) in Minnesota currently averages about $2,000 per mile. Actual transmission line specific maintenance costs will depend on the environmental setting, the amount of vegetation management necessary, storm damage occurrences, structure types, age of the line, etc.

5.8 Stray Voltage

"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 such as barns and milking parlors.

Transmission lines (like the Project) 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, Great River Energy suggests they contact their electric

service provider to discuss the situation with technical staff, including the possibility of an on-site investigation.

5.9 Corona

Under certain conditions, the localized electric fields (EF) near an energized transmission line conductor can produce small electric discharges, ionizing nearby air. This is commonly referred to as the "corona" effect. Most often, corona formation is related to some sort of irregularities on the conductor, such as scratches or nicks, dust buildup, or water droplets. The air ionization caused by corona discharges can result in the formation of audible noise and radio frequency noise.

Corona formation is a function of the conductor radius, surface condition, line geometry, weather condition, and most importantly, the line's operating voltage. As discussed in the subsections that follow, corona-induced audible noise and radio and television interference are typically not a concern for power lines with operating voltages below 161 kV (like the Project), because the EF intensity is too low to produce significant corona.

5.9.1 Corona: Radio and Television Interference

Because the likelihood of significant corona formation on the Project is minimal, the likelihood of radio and television interference due to corona discharges associated with the Project is also minimal. Great River Energy is unaware of any complaints related to radio or television interference resulting from the operation of any of its existing 115 kV facilities and does not expect radio and television interference to be an issue along the Proposed Route.

5.9.2 Corona: Audible Noise

Transmission lines can cause audible noise due to corona discharges from the conductors. The impacts and mitigation of audible noise due to the Project, including that due to corona, are discussed further in **Section 6.2.2**.

5.9.3 Corona: Air Impacts

Corona can also produce ozone and oxides of nitrogen in the air surrounding the conductor. Ozone is a very reactive form of oxygen molecule that combines readily with other elements and compounds in the atmosphere, making it relatively short lived. Ozone forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight, and inversely proportional to humidity. Thus, the conditions that are most likely to cause corona formation on a transmission line – humid, rainy, or foggy conditions – actually inhibit the production of ozone.

Like audible and radio frequency noise, corona-induced ozone, and nitrogen oxides (NO) are typically not a concern for power lines like the Project with operating voltages below 161 kV because the EF intensity is too low to produce significant corona. Therefore, Great River Energy expects ozone and NO concentrations associated with the Project to be negligible, and well below

all federal standards (nitrogen dioxide (NO2) – 100 parts per billion (ppb) as one-hour average, 53 ppb as annual average; ozone 70 ppb as 8-hour average).[10]

[10] "The Clean Air Act, which was last amended in 1990, requires USEPA to set National Ambient Air Quality Standards (40 CFR part 50) for six principal pollutants ("criteria" air pollutants) which can be harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. ***Primary standards*** provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children, and the elderly. ***Secondary standards*** provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings." https://www.epa.gov/criteria-air-pollutants/naaqs-table

6 ENVIRONMENTAL ANALYSIS

This portion of the Application provides a description of the human and environmental resources in the Project Area, potential impacts to these resources, and proposed mitigative measures. The Project Area is defined as the general area within an approximate 2-mile radius of the Project, unless otherwise defined in the following subsections.

6.1 Environmental Setting

The Project lies in the Big Woods Subsection, Minnesota, and NE Iowa Morainal Section of the Eastern Broadleaf Forest Province, according to the MDNR Ecological Classification System. The MDNR describes the Big Woods as:

> *This subsection coincides with a large block of deciduous forest present at the time of Euro-American settlement. Topography characteristically is gently to moderately rolling across this subsection. Soils are formed in thick deposits of gray limey glacial till left by the Des Moines lobe. Northern red oak, sugar maple, basswood, and American elm were most common in this dominantly forested region. Presently, most of the region is farmed.*[11]

The environmental setting of the Project Area includes several hydrologic features, such as wetlands, ponds, streams, lakes, including Cedar Lake, Mud Lake, and Sand Creek. Land use within the Project Area is primarily agricultural and rural residential areas, with pockets of industrial/commercial development.

There are existing transmission lines within the Project Area. The CapX2020 transmission line is north of the Proposed Route along 260th St E / County Road 2. The Xcel Energy 0744 69-kV line runs west and south of the Project, and the Great River Energy MV-EVX 115-kV line, which would serve as the connection point for the Proposed Project, runs north-south to the east of the Project (**Figure 1-2**).

The landscape and characteristics of the Project area are further described in the following subsections and are depicted in **Figures 6-1** through **6-7**. The characteristics of the Project Area are typical of the surrounding areas and does not preclude development of this Project.

6.2 Human Settlement

6.2.1 Displacement/Proximity of Project to Businesses and Residences

No displacement of residential homes, structures, or businesses will occur as a result of this Project. The NESC and Great River Energy standards require certain clearances between transmission line structures and buildings or structures within the ROW for safe operation of the proposed

[11] https://www.dnr.state.mn.us/ecs/222Mb/index.html

transmission line (**Table 3.2-2**). Great River Energy believes the Proposed Route provides sufficient design flexibility and distances from existing homes and structures for a transmission line design that achieves the requisite clearances.

The nearest residences are located along Baseline Avenue and 280th St E / State Highway 19. The closest home is approximately 176 feet from the Proposed Alignment (see **page 2 of Appendix A)**. **Table 6.2.1-1** summarizes the residential and non-residential buildings at various distances to the Proposed Alignment for the Project.

Table 6.2.1-1. Building Distances from Proposed Alignment

Building Type	0-50 feet	50-100 feet	100-150 feet	150-200 feet	Total
Home	0	0	0	1	1
Business	0	0	1	1	2
Outbuilding	1	2	1	3	7
Total	**1**	**2**	**2**	**5**	**10**

Impacts and Mitigation

No residences or businesses are anticipated to be displaced by the Project. Great River Energy's new transmission line will be designed in compliance with local, state, NESC, and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths.

Great River Energy will work with landowners to address alignment adjustments or pole placement, as necessary.

6.2.2 Noise

There will be temporary noise associated with the construction phase of the Project, and from operation of the Project.

Because human hearing is not equally sensitive to all frequencies of sound, the most noticeable frequencies of sound are given more "weight" in most measurement schemes. The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, which is the A-weighted sound level recorded in units of decibels.

A noise level change of 3 dBA is considered the lowest perceptible level 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. **Table 6.2.2-1** shows noise levels associated with common, everyday sources.

Table 6.2.2-1. Common Noise Sources and Levels

Sound Pressure Level (dBA)	Noise Source
110	Rock band at 5 meters
100	Jet flyover at 300 meters
90	Gas lawnmower at 1 meter
80	Food blender at 1 meter
70	Vacuum cleaner at 3 meters
60	Normal speech at 1 meter
50	Dishwasher next room, quiet urban daytime
40	Library, quiet urban nighttime
30	Bedroom at night
20	Quiet rural nighttime
10	Broadcast recording studio
0	Threshold of hearing
Source: Minnesota Pollution Control Agency. 2015. A Guide to Noise Control in Minnesota. Available online at: https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf.	

Established daytime and nighttime noise standards per Minnesota Rule 7030.0040 by Noise Area Classifications (NAC) are provided in **Table 6.2.2-2**. The standards are expressed as limiting levels of dBA within a one-hour period; L_{50} is the dBA not to be exceeded over 50 percent of the time (30 minutes) within an hour, while L_{10} is not to be exceeded over 10 percent of the time (6 minutes) within the hour.

Table 6.2.2-2. MPCA Noise Limits by Noise Area Classification (dBA)[12]

Applicable Noise Area Classification	Description	Daytime (7a – 10p)		Nighttime (10p – 7a)	
		L_{50}	L_{10}	L_{50}	L_{10}
1	Residential-type Land Use Activities	60	65	50	55
2	Commercial-type Land Use Activities	65	70	65	70
3	Industrial-type Land Use Activities	75	80	75	80

Land areas are assigned an NAC based on the land use activities at the location of the receiver and determine the noise standards applicable to that land use activity. The NAC is listed in the MPCA noise regulations to distinguish the categories. Residential areas, churches, educational and health services, and similar type land use activities are included in NAC 1; commercial-type land use activities are included in NAC 2; and industrial-type land use activities are included in NAC 3.

Noise-sensitive receptors along the Project Route include residences, businesses, and churches.

Noise Related to Construction

Construction noise is generally expected to occur during daytime hours as the result of heavy equipment operation and increased vehicle traffic associated with the transport of construction

[12] This table identifies the classifications potentially relevant to this Project. See Minn. R. 7030.0050 for the complete text of the rule.

personnel and materials to and from the work area. Construction activities will be performed with standard heavy equipment such as backhoes, cranes, boom trucks, and assorted small vehicles. Construction equipment noise levels will typically be less than 85 dBA at 50 feet when equipment is operating at full load[13] and will only occur when equipment is operating. Upon completion of construction activities, noise associated with construction equipment will cease.

Noise Related to Substation

No new substations will be constructed as part of the Project.

Noise Related to Transmission Lines

The Project will include a switch where the Project connects to the existing 115-kV MV-EVX transmission line. A switch can cause short-term (i.e., a minute or less) noise during opening or closing of the switches. These events will be infrequent and not likely perceivable to local landowners. The switch noise will not be perceptible at the nearest residence, which is approximately 300 feet south and across 280th St E / County Road 86 (see **page 3 of Appendix A)**.

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, appreciable operational noise impacts are not anticipated as a result of the Project. Further, proper design and construction of the transmission line in accordance with industry standards will help to ensure that noise impacts are not problematic.

Transmission lines can generate a small amount of sound energy during corona activity where a small electrical discharge caused by the localized EF near energized components and conductors ionizes the surrounding air molecules. 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 of the air components. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops can affect a conductor's electrical surface gradient and its corona performance.

Noise emission from a transmission line occurs during certain weather conditions. In foggy, damp, or rainy weather, power lines 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.

The industry standard for utilities is calculated based on L_{50} and L_5 for audible noise emissions. The worst-case scenario is when the transmission line is exposed to heavy rain conditions (i.e., one inch per hour). Anticipated noise levels for heavy rain conditions for a typical 115-kV line based on the results from the Bonneville Power Administration Corona and Field Effects Program

[13] United States. Federal Highway Administration, 2006. FHWA highway construction noise handbook. No. DOT-VNTSC-FHWA-06-02; FHWA-HEP-06-015. Available online at: https://www.fhwa.dot.gov/environment/noise/construction_noise/handbook/handbook00.cfm.

version 3 (U.S. Department of Energy, Bonneville Power Administration, Undated) are listed in **Table 6.2.2-3**.

Table 6.2.2-3. Anticipated Transmission Line Noise Levels with Heavy Rain

L_5	L_{50}	Location
17.7 dBA	14.2 dBA	edge of ROW
18.8 dBA	15.3 dBA	directly under line

The Project is located in a rural residential area. Ambient noise level in a rural residential area is about 40 dBA, day/night average sound level L_{dn}[14]. As shown in **Table 6.2.2-4**, the noise contribution due to corona effects will result in a change of 0.0 dBA above ambient. This change will not be noticeable to the human ear.

Table 6.2.2-4. Anticipated Total Noise Levels Associated with Heavy Rain

Item	Sound Level (dBA)
Ambient Sound Level - Rural Residential	40.0
Sound Contribution of Project Corona (maximum calculated)	18.8
Sound Contribution of Corona Noise plus Ambient	40.0
Potential Increase above the Ambient Level	0.0

Impacts and Mitigation

Noise associated with construction of the Project will be temporary in nature. To mitigate noise impacts associated with construction activities, work will generally be limited to daytime hours between 7 a.m. and 9 p.m. weekdays. Occasionally, there may be construction outside of those hours mentioned or on a weekend if Great River Energy has to work around customer schedules, line outages, or if the schedule has been significantly impacted due to permitting delays or other factors. Great River Energy will work with applicable stakeholders in the event construction becomes necessary outside of these hours. Heavy equipment will also be equipped, as required by local ordinances, with sound attenuation devices such as mufflers to minimize the daytime noise levels.

Operational noise levels are expected to be well below the state noise limits; therefore, the Project is not anticipated to contribute to an exceedance of noise standards, and no mitigation is proposed.

6.2.3 Aesthetics

The proposed transmission line will be visible along the Proposed Route, similar to the Great River Energy 115-kV MV-EVX transmission lines in the Project Area. Portions of the Proposed Route already have overhead Minnesota Valley distribution lines. The majority of the structures will be wood poles approximately 60 to 90 feet above ground with spans between poles ranging from 300 to 400 feet.

[14] USEPA. 1978. Protective Noise Levels

Where the Project overtakes distribution lines, it is Great River Energy's understanding that Minnesota Valley would likely decommission those lines and bury new lines rather than attaching the distribution lines as under-build to the Project's new structures. This would include locations along Baseline Avenue, and 280th St E/State Highway 19. Because the distribution lines are owned and maintained by Minnesota Valley, rather than Great River Energy, Great River Energy will not conduct or direct any activities related to the distribution lines. For reference, the location of existing distribution lines along the Proposed Alignment, 100-foot-wide ROW, and Proposed Route is depicted in **Appendix A**.

Design standards for a 115-kV line require taller structures than for distribution lines[15]. Where the Project overtakes the existing Minnesota Valley distribution lines, there will be fewer 115-kV structures than distribution structures because the taller structure heights allow for longer spans between structures.

The landscape in the Project area is a mix of agricultural land, rural residential, open space, commercial / industrial, and utility infrastructure (see **Section 6.4)**. The visual effect will depend largely on the perceptions of the observers across these various landscapes but will remain similar to current conditions. Although the area already has existing distribution lines in the viewshed, the visual contrast added by the taller transmission structures and lines may be perceived as a visual disruption.

Impacts and Mitigation

Because the Project will utilize existing Minnesota Valley distribution line ROW along portions of Baseline Avenue, and 280th St E / State Highway 19, and will otherwise largely be collocated with existing utilities and parallel existing road ROW (see **Section 5.3**), aesthetic impacts are anticipated to be minimal. The existing Minnesota Valley distribution lines have been in place for a decade or more, as the area has developed. Visual impacts might be perceived by a viewer as less because Great River Energy anticipates that the existing distribution underbuild will be buried by the owner of those facilities and there will be fewer structures. The new transmission line structures will be 20 to 30 feet taller with larger insulators, which might increase the visual impacts perceived by a viewer.

Where trees need to be cleared, this change to the landscape is typically a noticeable visual impact to receptors. The Proposed Route was developed in part to minimize the amount of tree clearing, which helps to minimize visual impacts.

Great River Energy will work with landowners to identify concerns related to the transmission line and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include:

- Location of structures, ROW, and other disturbed areas will be determined by considering input from landowners to minimize visual impacts.

[15] The existing 69-kV structures are typically approximately 50-60 feet above ground.

- 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.

6.2.4 Socioeconomics & Environmental Justice

The socioeconomic setting of the Project Area was evaluated on a regional basis, comparing data for the Scott County, Rice County, and the State of Minnesota. No data was available for Helena or Cedar Lake Townships. Data compiled from the U.S. Census Bureau QuickFacts are summarized in **Table 6.2.4-1.**

Table 6.2.4-1. Socioeconomic Characteristics within the Project Area[16]

Location	2020 Population	White Alone Population	Median Income (2017-2021)	Percent Below Poverty Level	Language Other than English Spoken at Home (2017-2021)
State of Minnesota	5,706,494	78.1%	$77,706	9.3%	12.1%
Scott County	150,928	78.2%	$109,031	4.6%	13.5%
Rice County	67,097	80.2%	$71,384	9.4%	13.1%

An environmental justice analysis for the Project was completed using the methodology in Minn. Stat. 216B.1691, subd. 1(e) (rev. 2023), which provides:

"Environmental justice area means 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:

(1) 40 percent or more of the area's total population is nonwhite;

(2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;

(3) 40 percent or more of the area's residents over the age of five have limited English proficiency; or

[16] Data Source: US Census QuickFacts, downloaded 04/17/2023: U.S. Census Bureau QuickFacts: United States

(4) the area is located within Indian country, as defined in United State Code, title 18, section 1151."[17]

Census tracts that intersect with the Proposed Route were analyzed for environment justice areas, consistent with this statute. Census tracts are the best approximation of a geographic area where adverse impacts can occur from the Project. Census tracts are shown in **Figure 6-1**. Scott County was used as a reference population for the census tracts.

Table 6.2.4-2 identifies the minority populations by race and ethnicity, low-income populations, and populations with a language other than English spoken at home for Scott County and census tracts crossed by the Project Route. The most recent available data was used: U.S. Census 2021 American Community Survey 5-Year Estimate Data File# B17017, File# B03002, and File# DP02.

Table 6.2.4-2. Environmental Justice Data for Census Tracts Crossed by the Project Route[18]

County/Census Tract	2021 Population	Percent Total Minority [a]	Percent Below Poverty Level	Language Other Than English Spoken at Home (2017-2021)
Scott County	149,568	20.8	4.0	13.5
Census Tract 811.01	3,035	1.9	1.4	1.2
Census Tract 812	6,609	10.3	5.4	2.4
[a] "Minority" refers to people who reported their ethnicity and race as something other than non-Hispanic White.				

No federally recognized Tribal Areas are crossed by the Project. As presented in **Table 6.2.4-2**, no census tracts within the Project Area are considered environmental justice communities under the definition provided in Minn. Stat. 216B.1691, subd. 1(e).

In addition, because analyses in prior Route Permit Applications have utilized this methodology, Great River Energy also conducted this environmental justice analysis in accordance with the U.S. Environmental Protection Agency (USEPA) Federal Interagency Working Group on Environmental Justice (EJ) and National Environmental Policy Act (NEPA) Committee's publication, Promising Practices for EJ Methodologies in NEPA Reviews (Promising Practices).

Using this methodology, the USEPA's Environmental Justice Screening Tool (EJScreen) was used as an initial step to gather information regarding minority and/or low-income populations; potential environmental quality issues; environmental and demographic indicators; and other important factors. The USEPA recommends that screening tools, such as EJScreen, be used for a "screening-level" look and a useful first step in understanding or highlighting locations that may

[17] Although this statute does not prescribe requirements for a route permit application, Great River Energy employs this methodology here consistent with the methodology used by EERA in a recently issued EA. *See* Docket No. ET2/22-235.

[18] Data Source: US Census 2021 ACS 5-Year Estimates Detailed Tables File# B03002, File #B17017, and File#DP02, downloaded 04/28/2023: https://data.census.gov/

require further review. EJScreen was used to evaluate the Proposed Route plus a 0.25-mile buffer. The tool's output indicated, "The area is too small or sparsely populated, or these data are not available in the national dataset. Cannot generate an EJScreen chart or report."

According to Promising Practices, minority populations are those groups that include American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Following the recommendations set forth in Promising Practices, the 50 percent and the meaningfully greater analysis methods was used to identify minority populations. Using this methodology, minority populations are defined where either (a) the aggregate minority population of the block groups in the affected area exceeds 50 percent; or (b) the aggregate minority population in the block group affected is 10 percent higher than the aggregate minority population percentage in the county. The guidance also directs low-income populations to be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. Using Promising Practices' low-income threshold criteria method, low-income populations are identified as block groups where the percent of low-income population in the identified block group is equal to or greater than that of the county. Scott County is the comparable reference community to ensure that all affected environmental justice communities are properly identified.

Table 6.2.4-3 identifies the minority populations by race and ethnicity and low-income populations within Minnesota, Scott County, and U.S. Census block groups crossed by the Project. U.S. Census 2021 American Community Survey 5-Year Estimate Data File# B17017 and File# B03002 for the race, ethnicity, and poverty data were analyzed at the block group level.

Table 6.2.4-3. Minority Populations by Race and Ethnicity and Low-Income Populations within the Project Area

State/County/Census Block Group	% White	% Black/ African American	% American Indian or Alaskan Native	% Asian	% Native Hawaiian/ Pacific Islander	% Some Other Race	% Two or More Races	Hispanic or Latino	% Total Minority [a]	% Below Poverty Level
State of Minnesota	78.3	6.5	0.8	5.0	0.0	0.3	3.4	5.6	21.7	9.2
Scott County	79.2	4.8	0.4	6.2	0.0	0.3	3.7	5.5	20.8	4.0
Census Tract 811.01, Block Group 1	98.3	0.0	0.0	0.5	0.0	0.0	0.8	0.4	1.7	2.1
Census Tract 811.01, Block Group 3	99.9	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0
Census Tract 812, Block Group 4	95.6	0.4	0.0	0.5	0.0	1.5	1.2	1.0	4.6	2.4

[a] "Minority" refers to people who reported their ethnicity and race as something other than non-Hispanic White

As presented in **Table 6.2.4-3**, no block groups are considered environmental justice communities.

Impacts and Mitigation

During construction, there may be short-term positive impacts to the nearby communities. Potential increases in local revenue may occur for businesses, such as hotels, grocery stores, gas stations and restaurants to support utility personnel and contractors.

Long term benefits of the Project include the ongoing reliable electrical services and the ability to serve existing and new local load growth. The benefits apply to the local community regardless of economic status, race, and personal identification.

There are no environmental justice communities impacted by the Project, so no environmental justice impacts are anticipated. Because impacts to socioeconomics will be generally short-term and beneficial, no mitigation is proposed.

6.2.5 Cultural Values

Scott County

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community unity. According to the Scott County 2040 Comprehensive Plan, Scott County is the youngest and fastest growing county in the state, and its population growth is anticipated to continue to outpace all other counties in Minnesota through 2040. Scott County has experienced considerable population growth and has become more urbanized and ethnically diversified over the past 50 years. The Scott County vision is described as a "*well-planned, safe, prosperous and fiscally responsible community built by citizens and businesses who value neighborhoods, education, families, health, and public safety, and who enjoy its natural beauty, rural character, and location in the region.*"[19]

Scott County is an agriculturally based community; however, it has diversified with commercial, industrial, and housing developments. The Shakopee Mdewakanton Sioux Community is a federally recognized Indian Tribe that holds land in north-central Scott County, owns and operates the Mystic Lake Casino, and is one of the largest employers in Scott County. The County is home to several historical, scenic, and entertainment destinations including Canterbury Park, Murphy's Landing, Elko Speedway, Renaissance Festival, Valleyfair, and the aforementioned Mystic Lake Casino. Scott County has been working to expand outdoor recreational opportunities for its residents by preserving land to steward and conserve natural resources and wildlife habitat, and increasing funding and therefore services (e.g., new parks, trails, improved accessibility, infrastructure maintenance) associated with the regional park system.

Scott County also supports the use of renewable and alternative energy sources to reduce greenhouse gases and protect the natural environment.

[19] 2040 Comprehensive Plan | Scott County, MN (scottcountymn.gov)

Rice County

Rice County, which is located to the south of Scott County, is considered a transitional area between south-central and southeastern Minnesota. It is more rural in character relative to Scott County, and much of the land use is agricultural for the production of corn and soybeans as well as livestock operations. The Rice County Vision statement states that "*As Rice County grows and evolves into the future, we will support and encourage orderly growth and a diverse economy that will continue to create jobs and a high quality of life for our citizens. We will aspire to maintain the small town feel of our cities and preserve our agricultural heritage*."[20]

Rice County is home to the Minnesota State Academies, St. Olaf College, and Carleton College. It boasts 13 parks within the park system totaling over 1,100 acres, in addition to open space such as Rossez Wildlife Area, Cannon River, Wildlife Management Areas, State Scientific and Natural Areas, conservation lands, farmed lands, and forest lands.

Similar to Scott County, Rice County also supports the use of renewable and alternative energy sources and has taken steps to become a more sustainable place for residents and visitors.

Impacts and Mitigation

Construction of the proposed Project is not expected to conflict with the cultural values of the area; therefore, no mitigation is proposed.

6.2.6 Recreation

Recreational resources near the Proposed Route are shown on **Figure 6-2**.

Cedar Lake and the associated Cedar Lake Farm Regional Park in Scott County are located approximately 0.25 miles north of the existing Cedar Lake Substation. The Cedar Lake Farm Regional Park consists of picnic areas, trails, swimming, fishing areas, and public boat launches.[21]

The St. Patrick State Wildlife Management Area (WMA) is located to the west of Cedar Lake and is managed by the MDNR. This WMA encompasses approximately 87 acres of primarily wetlands with adjacent oak woodland and is managed for wetland species.[22]

The Creeksbend Golf Course in Scott County is located approximately 0.45 mile east of the Proposed Route along Baseline Avenue. It is an 18-hole golf course located within 230 acres of wooded, rolling hills and native prairies and 80 acres of ponds and wetlands.[23]

Fishing lakes within the Project Area in Scott County include Cedar Lake, Mud Lake, Nash Lake, and Dvorak Wildlife Pond.

[20] 2021-Comp-Plan-Chapter-1---Introduction (ricecountymn.gov)

[21] https://www.threeriversparks.org/location/cedar-lake-farm-regional-park

[22] https://www.dnr.state.mn.us/wmas/detail_report.html?id=WMA0015000

[23] https://www.creeksbendgolfcourse.com/

There are several parks associated with the City of New Prague, located approximately 2 miles to the west, including Sliding Hill Stake Park, Heritage Park, Greenway Park, Settlers Park, Memorial Park, and New Prague Golf Club.

The Scott County Waterfowl Production Area (WPA) is crossed by the Proposed Route near the connection with Great River Energy's MV-EVX 115-kV line; however, the Proposed Alignment avoids structure placement within the WPA. This WPA is managed by the USFWS Minnesota Valley Wetland Management District.

There are several snowmobile trails in both Scott and Rice counties within the Project area, as shown in **Figure 6-2**.

Impacts and Mitigation

The Proposed Alignment will cross over and parallel the local snowmobile trail along Baseline Avenue for about 1.8 miles (**Figure 6-2**). The existing Minnesota Valley distribution line already parallels this snowmobile trail, which will help to mitigate the transmission line's visual impacts. Great River Energy currently plans to construct the Project from October 2024 through May 2025. If construction activities will impact any of the snowmobile trails, Great River Energy will coordinate with the trail associations regarding any trail closures to mitigate impacts by assisting in finding alternate routes.

No impacts to local recreational activities are expected. Because no additional impacts to recreation are anticipated, no mitigation is proposed.

6.2.7 Public Services and Transportation

The Project is located in a principally agricultural and rural residential area. Private landowners in the Project Area have their own private wells and individual sewage treatment systems. The residents also have access to other utility services by various providers, including waste collection, natural gas, cable television, electricity, and telephone.

Several existing overhead transmission lines are located in the Project Area (see **Figure 1-3)**, including the CapX2020 transmission line located to the north of the Proposed Route running east-west along 260th St E. Xcel Energy's 69-kV 0744 transmission line runs north-south approximately 1.7 miles east of the Cedar Lake Substation. South of the City of New Prague, the line turns to the east and parallels the Proposed Alignment approximately 1.5 miles south of 280th Street / State Highway 19. In addition, Great River Energy's 115-kV MV-EVX transmission line runs north-south on Panama Ave / County Highway 23 to the east of the Project, which will serve as the connection point for the Project.

The Minnesota Pipeline Company maintains the MinnCan crude oil pipeline, which runs generally east-west through the northern portion of the Project Area. The Proposed Alignment would be collocated with this pipeline corridor for approximately 0.4 mile from the Cedar Lake Substation

to Baseline Avenue (**page 1 of Appendix A**[24]). There is also an existing natural gas pipeline maintained by Northern Natural Gas Pipeline to the east and southeast of the Project Area. Other existing utilities, such as gas/oil pipelines and electric distribution lines, and site improvements, such as septic systems and wells, will be identified during survey activities.

The Proposed Route will follow existing distribution lines maintained by the Minnesota Valley along both Baseline Avenue and 280th St E / State Highway 19 (**pages 1-3 of Appendix A**). Currently, the Proposed Alignment will be located within the existing distribution line easement for about 2.5 miles.

The Proposed Route will parallel and/or intersect with several township, county, and state-managed roads and highways as described in **Table 6.2.7-1** and shown in the maps in **Appendix A**.

Table 6.2.7-1. Highways or Roads within the Project Area

Highway / Road Name	Jurisdiction	Parallel / Intersects	Traffic Volumes (SEQ # / Year) [25]
Baseline Ave	Helena / Cedar Lake Township	Parallel	Not available
270th St W	Helena Township	Intersect	Not available
280th St E / State Highway 19	MnDOT	Parallel	8,057-9,120 (11009 and 10255, 2021)
Teale Ave (N) / Leroy Ave (S)	Cedar Lake Township	Intersect	Not available
Langford Ave / New Prague Blvd / State Highway 13	MnDOT	Intersect	4,079 (11008, 2021)
Lake Ave	Wheatland Township	Intersect	Not available
Joel D Lane	Cedar Lake Township	Intersect	Not available
Kanabec Ave	Wheatland Township	Intersect	Not available
Country Hollows Lane	Cedar Lake Township	Intersect	Not available
Balsa Ave (N) / Jackson Ave or County Road 52 (S)	Cedar Lake Township / Rice County	Intersect	295 (32949, 2020 for Jackson Ave or County Road 52)
Panama Ave / County Highway 23 (N) / Independence Ave / State Highway 19 (S)	Scott County (N) / MnDOT (S)	Intersect	1,850 (42172, 2018) / 3,750 (4745, 2018)
280th St E / County Road 86	Scott County	Parallel	Not available

The Proposed Route parallels approximately four miles of 280th St E / State Highway 19, which is considered a principal arterial road in Scott County (**pages 2-3 of Appendix A**). The Proposed Route would also cross Langford Ave / New Prague Blvd / State Highway 13 (**page 2 of Appendix A**), which is also considered a principal arterial road. However, none of the highways or roads within the Project Area have been identified by Scott County as having current or forecasted daily traffic volume or congestion capacity issues.[26]

[24] The MinnCan crude oil pipeline location is not provided on the maps in **Appendix A** because this is proprietary information.

[25] Traffic Mapping Application (arcgis.com)

[26] https://scottcountymn.gov/DocumentCenter/View/9908/Chapter-06-Transportation?bidId=

Impacts and Mitigation

Great River Energy will coordinate Project construction schedules, including any outages, with Minnesota Valley to avoid and/or minimize disruptions to service in the area. Based on the location of other existing utilities and site improvements that are identified during survey activities, the transmission line will be designed to meet or exceed required clearances and pole locations. No structure locations will be placed on or near existing utilities, including the oil pipeline. Because the majority of the Proposed Route will follow existing utility and road ROW, no impacts to public services are anticipated and, therefore, no mitigation is proposed. Similarly, because the Project is primarily proposed to be routed in existing distribution line and road ROW, Great River Energy does not anticipate impacts to site improvements such as wells or septic systems.

Temporary access for construction of the transmission line would be along the transmission line ROW. Temporary and infrequent traffic impacts associated with equipment/material delivery and worker transportation will occur. Stringing the conductors and shield wire across roads can be accomplished with minimal traffic impacts. Typically, a pulling rope is simply carried across the road, which is then pulled overhead. Temporary structures may be installed inside or outside of road ROW to ensure pulling lines, shield wire, or conductors to have sufficient clearance over roads. Great River Energy or its contractors will work with the MnDOT through its application process for a Utility Accommodation Permit in MnDOT ROW and comply with all permit conditions. Applicable licenses where the line impacts county and local roads will also be obtained and complied with.

When appropriate, pilot vehicles will accompany the movement of heavy equipment. Traffic control barriers and warning devices will be used when appropriate. All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations will be conducted to offer the least possible obstruction and inconvenience to the traveling public. Great River Energy or its contractors will 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.

Given that the Project will primarily follow existing utility and road ROW, there will be minimal impacts to other utilities. To ensure that any short-term and infrequent traffic impacts are minimized, Great River Energy will coordinate with all affected road authorities and, to the extent practicable, schedule large material/equipment deliveries to avoid periods when traffic volumes are high.

6.3 Public Health and Safety

The Project will be designed in compliance with local, state, NESC, and Great River Energy standards regarding clearance to the ground, clearance to crossing utilities, strength of materials, and ROW widths. Construction crews and/or contract crews will comply with local, state, and NESC standards regarding installation of facilities and standard construction practices. Great River Energy's established safety procedures, as well as industry safety procedures, will be followed during and after installation of the transmission line, including clear signage during all construction activities. See **Chapter 5** for detailed discussions on construction practices and safety.

6.3.1 Electric and Magnetic Fields

As it pertains to the Project, the term "EMF" refers to the extremely low frequency (ELF) decoupled electric and magnetic fields (MFs) that are present around any electrical device or conductor and can occur indoors or outdoors. EFs are the result of electric charge, or voltage, on a conductor. The intensity of an EF is related to the magnitude of the voltage on the conductor. MFs are the result of the flow of electricity, or current, traveling through a conductor. The intensity of a magnetic field is related to magnitude of the current flow through the conductor. Electric and MF can be found in association with transmission lines, local distribution lines, substation transformers, household electrical wiring, and common household appliances.

Electric Fields

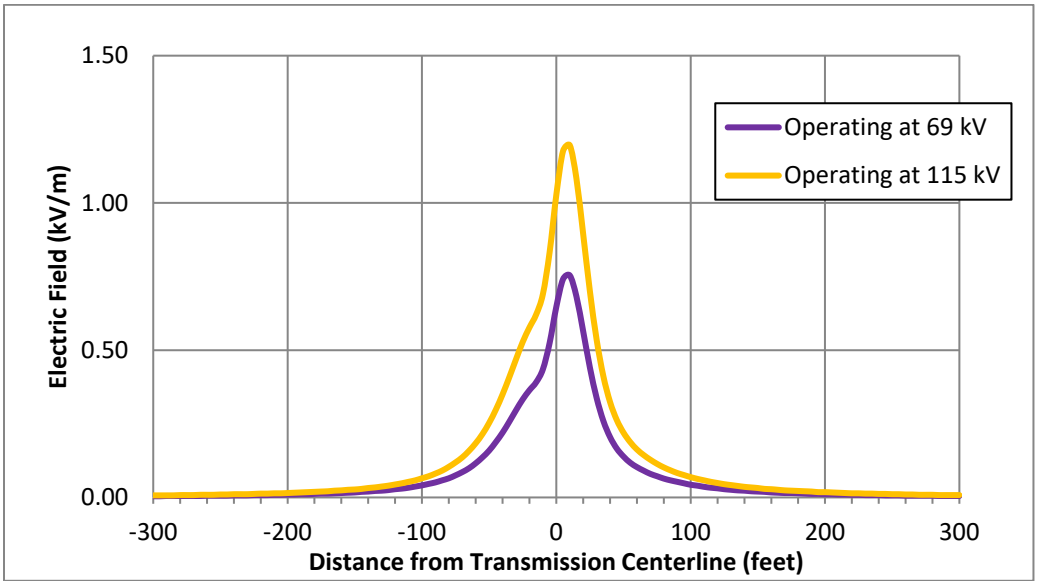
Voltage on a wire produces an EF in the area surrounding the wire. The voltage on the conductors of a transmission line generates an EF extending from the energized conductors. The intensity of transmission line EFs is measured in kilovolts per meter (kV/m), and the magnitude of the EF rapidly decreases with distance from the transmission line conductors. The presence of trees, buildings, or other solid structures in the path of the field can also significantly reduce the magnitude of the EF. Because the magnitude of the voltage on a transmission line is near-constant (ideally within ±5 percent of nominal), the magnitude of the EF will be near-constant regardless of the power flowing on the line.

Although there is no state or federal standard for transmission line EF exposures, the EQB developed a standard of a maximum EF limit of 8 kV/m at one meter (3.28 feet) above ground; this standard has been adopted by the Commission. Great River Energy has calculated the approximate EF for the Project's transmission configuration and estimates the peak magnitude of EF density to be well below the EQB standard at approximately 1.2 kV/m underneath the conductors, one meter above ground. **Table 6.3.1-1** summarizes the EFs calculated for the proposed single circuit transmission line. These EF calculations are also shown graphically in **Diagram 6-1**.

Table 6.3.1-1. Calculated Electric Fields (kV/M) for Proposed Alignment (One meter (3.28 feet) above ground)

Operating Voltage (kV)	Max Operating Voltage (kV)	Distance to Proposed Alignment – Electric Field (feet)										
		-300	-200	-100	-50	-25	Max	25	50	100	200	300
69-kV	72.5	0.00	0.01	0.04	0.16	0.33	0.75	0.44	0.14	0.04	0.01	0.01
115-kV	120.75	0.01	0.02	0.07	0.25	0.53	1.20	0.70	0.22	0.07	0.02	0.01

Diagram 6-1. 115-kV Single Circuit Line Electric Field Profile



Induced Voltage

When an EF 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, similar to what can occur when a person walks across a carpet and touches an object or person.

The main concern with induced voltage is not the magnitude of the voltage induced, but the current that would flow through a person to the ground should the person touch the object. To ensure the safety of persons in the proximity of high voltage transmission lines, the NESC requires that any discharge be less than five milliAmperes root mean square (mA rms). Great River Energy would ensure that any fixed conductive object in close proximity or parallel to the Project, such as a fence or other permanent conductive fixture, would be grounded so any discharge would be less than the 5 mA rms NESC limit.

Implantable Medical Devices

High intensity EMF can have adverse impacts on the operation of implantable medical devices (IMDs) such as pacemakers and defibrillators. While research has shown that the MFs associated with HVTLs do not reach levels at which they could cause interference with such devices, it is possible that the EFs associated with some HVTLs could reach levels high enough to induce sufficient body currents to cause interference.

Modern "bipolar" cardiac devices are much less susceptible to interactions with EFs. Manufacturers of pacemakers and other IMDs, have indicated that EFs below 6 kV/m are unlikely to cause interactions affecting operation of most of their devices. **Table 6.3.1-2** and **Diagram 6-1**

show that the EFs for the Project are well below levels at which modern bipolar devices are susceptible to interaction with the fields.

The older "unipolar" designs of cardiac devices are more susceptible to interference from EFs. Research from the early 1990s indicates that the earliest evidence of interference with these types of IMDs could occur in EFs ranging from 1.2 to 1.7 kV/m. For older style unipolar designs, the EFs do exceed levels that research from the 1990s has indicated may produce interference. However, research conducted in 2005 concluded that the risk of interference to unipolar cardiac devices from high voltage power lines in everyday life is small. In 2007, Minnesota Power and Xcel Energy conducted studies with Medtronic, Inc. under 115-kV, 230-kV, 345-kV, and 500-kV transmission lines to confirm these 2005 findings. The analysis was based on real life public exposure levels under actual transmission lines in Minnesota and found no adverse interaction with pacemakers or IMDs. The analysis concluded that although interference may be possible in unique situations, device interference as a result of typical public exposure would be rare.[27]

In the unlikely event that a pacemaker is impacted, the effect is typically a temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker will return to its normal operation when the person moves away from the source of the interference.

Magnetic Fields

Current passing through any conductor, including a wire, produces a magnetic field in the area around the wire. The current flowing through the conductors of a transmission line generates a magnetic field that, in similar fashion to the EF, extends outward from the energized conductors. The intensity of the magnetic field associated with a transmission line is proportional to the amount of current flowing through the line's conductors, and the magnitude of the magnetic field rapidly decreases with the distance from the conductors. Unlike EFs, MFs are not significantly affected by the presence of trees, buildings, or other solid structures nearby. The value of the magnetic field density is expressed in the unit of gauss (G) or milligauss (mG).

There are no federal or Minnesota exposure standards for MFs. The EQB and the Commission have recognized Florida (a 150-mG limit) and New York (a 200-mG limit) state standards. Both state standards are to be considered at the edge of ROW. Studies of the health effects from MFs conclude that the evidence of health risk is weak.[28] The general standard is one of prudent avoidance.

MF levels associated with some common electric appliances are provided in **Table 6.3.1-2.**

[27] 2007 Minnesota Power Systems Conference Proceedings (University of Minnesota), *Electromagnetic Compatibility of Active Implantable Medical Devices (AIMD) and Their Interaction with High Voltage Power Lines*, at 23.

[28] Minnesota Department of Health. *EMF White Paper on Electric and Magnetic Field* (EMF) Policy and Mitigation Options. 2002; National Research Council. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*. 1997; www.niehs.nih.gov/health/topics/agents/emf/.

Table 6.3.1-2. Magnetic Fields of Common Electric Appliances (mG)[29]

Appliance	Distance from Source		
	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

Table 6.3.1-3 summarizes the MFs calculated for the proposed transmission line configuration with power flow at peak loading and at average loading. The magnetic field calculations are also shown graphically in **Diagram 6-2.** The maximum magnetic field under expected peak demand conditions is 9.85 mG, which is below most of the levels shown in **Table 6.3.1-3**.

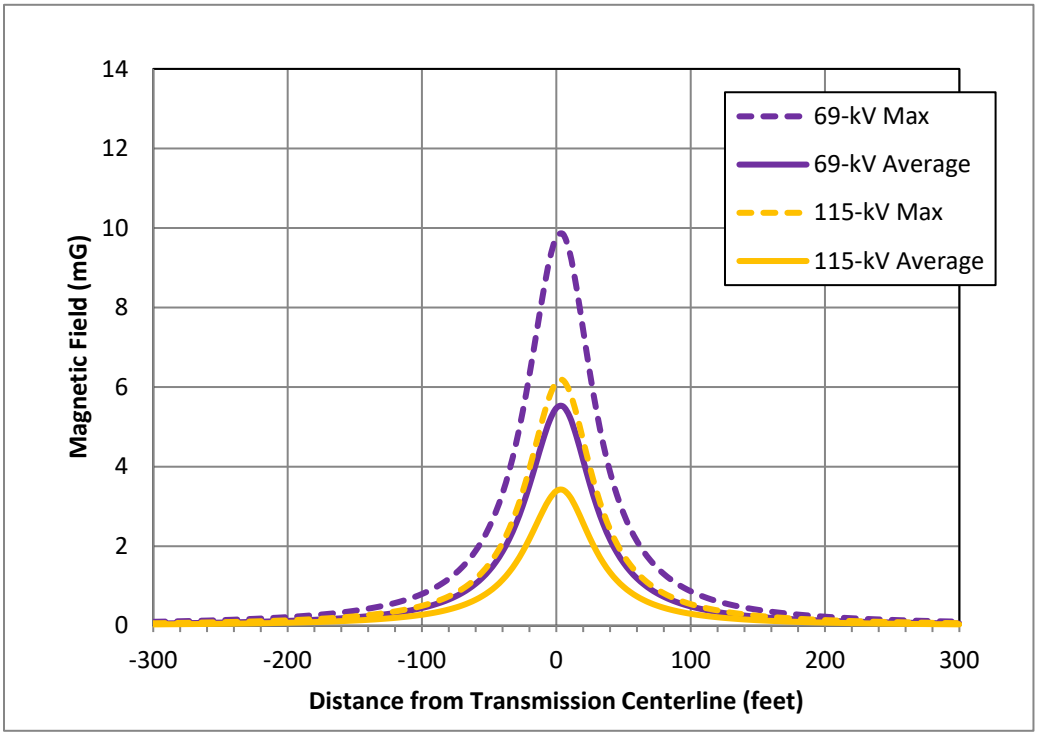
Because the actual power flow on a transmission line could potentially vary throughout the day depending on electric demand, the actual magnetic field level could also vary widely from hour to hour. In any case, the typical magnitude of the magnetic field associated with the proposed transmission line is expected to be well below the calculated intensity at the expected peak loading.

Table 6.3.1-3. Calculated Magnetic Fields (mG) for Proposed Alignment Designs

Operating Voltage	Max Operating Voltage (kV)	Line Current (Amps)	Distance to Proposed Alignment – Magnetic Field (feet)										
			-300	-200	-100	-50	-25	Max	25	50	100	200	300
69-kV Peak Load	72.5	75	0.10	0.22	0.80	2.48	5.38	9.85	6.36	2.83	0.87	0.23	0.10
69-kV Average Load	72.5	42	0.06	0.12	0.45	1.39	3.01	5.52	3.56	1.59	0.49	0.13	0.06
115-kV Peak Load	120.75	47	0.06	0.14	0.50	1.55	3.37	6.17	3.98	1.77	0.54	0.14	0.06
115-kV Average Load	120.75	26	0.03	0.08	0.28	0.86	1.87	3.41	2.20	0.98	0.30	0.08	0.04

[29] *EMF In Your Environment* (USEPA 1992)

Diagram 6-2. 115-kV Single Circuit Line Magnetic Field Profile



Impacts and Mitigation

Considerable research has been conducted since the 1970s to determine whether exposure to power-frequency, commonly referred to as "extremely-low frequency" or "ELF" (60 hertz), EFs and MFs can cause biological responses and adverse health effects. The multitude of epidemiological and toxicological studies has shown, at most, a weak association (i.e., no statistically significant association) between ELF-MF exposure and health risks and no association between ELF-EF exposure and health risks.

In 1999, the National Institute of Environmental Health Sciences (NIEHS) issued its final report on "Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields" in response to the Energy Policy Act of 1992. In the report, the NIEHS concluded that the scientific evidence linking EMF exposures with health risks is weak and that this finding does not warrant aggressive regulatory concern. However, in light of the weak scientific evidence supporting some association between EMF and health effects and the fact that exposure to electricity is common in the United States, the NIEHS stated that passive regulatory action, such as providing public education on reducing exposures, is warranted.[30] Other studies have come to similar decisions.[31]

[30] Report is available at http://www.niehs.nih.gov/health/topics/agents/emf/

[31] Minnesota Department of Health. 2002. *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options;* World Health Organization. 2007. *Environmental Health Criteria Volume No. 238 on Extremely Low Frequency Fields*

Based on findings like those of the Working Group and NIEHS, the Commission has consistently found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects."[32] This conclusion was further justified in the Route Permit proceedings for the Brookings Project. In the Brookings Project Route Permit proceedings, the Applicants (Great River Energy and Xcel Energy) and one of the intervening parties both provided expert evidence on the potential impacts of ELF-EF and ELF-MF, including the World Health Organization findings (2007). The ALJ in that proceeding evaluated written submissions and a day-and-a-half of testimony from the two expert witnesses. The ALJ concluded: "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EF and MF] exposure."[33] The Commission adopted this finding on July 15, 2010.[34]

No impacts to public health and safety are anticipated as a result of the Project. The Project will be designed in compliance with local, state, NESC, and Great River Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths. The Cedar Lake Substation and other substations in the region are equipped with protective breakers and relays. The protective equipment is designed to de-energize the transmission line when needed. All substations are protected by barbed-wire-topped fencing. Signage attached to the fence lists the owner (Minnesota Valley owns the Cedar Lake Substation), provides a telephone contact number, and warns about electrical hazards within the substation.

Great River Energy will ensure that safety requirements are met during construction and operation of the facilities. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public. With implementation of these safeguards and protective measures, no additional mitigation is proposed.

6.4 Land Use/Zoning

The existing Cedar Lake Substation and the Proposed Route west of Baseline Avenue are located in Helena Township, in Scott County. The Proposed Route from Baseline Avenue south to 280th St E / State Highway 19 is located with Cedar Lake Township, Scott County. Then, the Proposed Route follows 280th St E / State Highway 19, which corresponds with the Scott County / Rice County line. The Proposed Alignment crosses over the county line six times, with 2.0 miles on the north side in Cedar Lake Township, Scott County, and 2.0 miles on the south side in Wheatland Township, Rice County. The Project Area is to the east and outside of the City of New Prague.

[32] See, for example, *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, Docket No. ET-2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities (August 1, 2007).

[33] *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, ALJ Findings of Fact, Conclusions and Recommendation at Finding 216 (April 22, 2010, and amended April 30, 2010)

[34] *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (September 14, 2010)

The Project Area consists largely of agricultural and rural development land use patterns. Land cover along the Proposed Route is a mix of agriculture, residential, woodlands, and wetlands (**Figure 6-3**).

Zoning information for the Project Area is provided in **Figure 6-4**. The Project is zoned as follows:

- Scott County[35] / Helena Township – Urban Reserve Districts
- Scott County / Cedar Lake Township – Agricultural / Rural Districts, Residential Districts and Urban Reserve Districts
- Rice County[36] / Wheatland Township – Agricultural

Per the Scott County and Rice County Zoning Ordinances, essential public services including transmission, utilities, and substations are allowable within these zones with a conditional use permit.[37,38]

Impacts and Mitigation

Impacts to land use as a result of the Project are expected to be minimal, and construction of the line will not change land uses, particularly given that the Project will be located with existing utility and road ROW. Short-term agricultural impacts might occur during construction, which will be mitigated through restoration and compensatory payments (**Section 6.5.1**). Minimal impacts to residential land uses are anticipated; therefore, no additional mitigation is proposed.

6.5 Land-based Economies

6.5.1 Agriculture

According to the 2017 U.S. Department of Agriculture (USDA) Census of Agriculture, Scott County has 740 individual farms with an average farm size of 156 acres and covers approximately 115,504 acres (52 percent) of the county. Over $75 million was generated from both crop and livestock sales in 2017. Rice County has 1,242 individual farms with an average farm size of 182 acres and covers approximately 226,255 acres (69 percent) of the county. Over $204 million was generated from both crop and livestock sales in 2017.

Agricultural lands within the Proposed Route consist primarily of pasture, hay, and cultivated lands (**Figure 6-3**). The transmission line ROW is not inconsistent for use as pasture, hay, or other crop cultivation. The Proposed Alignment will cross about 3.2 miles of agricultural land, which conservatively is 39.6 acres (within the 100-foot ROW)[39]. Accordingly, there will be negligible

[35] https://gis.co.scott.mn.us/sg3/#

[36] https://www.ricecountymn.gov/DocumentCenter/View/385/Zoning-Map

[37] https://www.scottcountymn.gov/DocumentCenter/View/1428/Zoning-Ordinance-No-3-?bidId=

[38] https://mn-ricecounty.civicplus.com/DocumentCenter/View/393/Chapter-508-Zoning-Districts-Zoning-Map-and-Uses. Nonetheless, a Commission route permit preempts local zoning approvals. Minn. Stat. § 216E.10, subd. 1.

[39] https://www.usgs.gov/programs/gap-analysis-project/science/land-cover-data-download

incremental impacts to pasture, hay, and cultivated lands. No organic farms will be impacted by the Project.[40, 41]

Impacts and Mitigation

Some agricultural land may be temporarily removed from production during transmission line construction. Determination of temporary agricultural impacts that will result from construction is dependent upon final engineering design. The acreage anticipated to be included in temporary construction access points includes some cultivated lands. Construction of the proposed transmission structures will require repeated access to structure locations to install the structures and to string conductors. Equipment used in the construction process will include backhoes, cranes, boom trucks and assorted small vehicles. Operation of these vehicles on adjoining farm fields can cause rutting and soil compaction, particularly during springtime and otherwise wet conditions.

Great River Energy will work with landowners to minimize impacts to agricultural activities along the Proposed Route and will compensate landowners for any crop damage / loss and soil compaction that may occur during construction. Areas disturbed during construction will be repaired and restored to pre-construction contours as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Specific mitigation measures to be implemented include:

- Local roads will be used as practicable for moving equipment and installing structures.

- Where local roads cannot be used, movement of crews and equipment will be limited to the ROW to the greatest extent possible, including access to the route. Contractors employed by Great River Energy will limit movement on the ROW to minimize damage to grazing land or property. If movement outside of the ROW is necessary during construction, permission will be obtained, and any damage will be paid to the landowner.

- Construction will be scheduled during periods when agricultural activities will be minimally affected to the extent possible, or the landowner will be compensated accordingly.

- Ruts that are hazardous to agricultural operations will be repaired or compensation will be provided as an alternative if the landowner desires. Such ruts will be leveled, filled, and graded or otherwise eliminated in an approved manner. In the pasture area, compacted soils will be loosened and ruts will be leveled by scarifying, harrowing, discing, or by other approved methods. Damage to ditches, terraces, roads, and other features of the land will be corrected using approved methods and indigenous plants where necessary. The land and facilities will be restored as nearly as practicable to their original conditions.

[40] https://www.mda.state.mn.us/organic-farm-directory-county

[41] https://organic.ams.usda.gov/integrity/

- ROW easements will be purchased through negotiations with each landowner affected by the Project. Restoration or compensation will subsequently be made for reasonable crop damages or other property damages that occurs during construction or maintenance as negotiated.

- Fences, gates, and similar improvements that are removed or damaged will be promptly repaired or replaced.

Some temporary construction space will be needed for the Project. For temporary marshalling yards, which will provide space to store material and equipment, and temporary space needed for pulling equipment, Great River Energy will work with local landowners to lease the space by agreement with the respective landowner(s), remove and properly dispose of all material and debris, and repair all damages and perform restoration, as necessary. It is anticipated that minimal temporary construction space on property immediately adjacent to the ROW and on private property will be needed, with the exception of limited equipment access and pulling areas.

6.5.2 Forestry

Forested areas are shown in the Detailed Route Maps provided in **Appendix A**. Based on available aerial photographs, Great River Energy will clear approximately 16.7 acres of trees over approximately 2.1 miles within the 100-foot-wide ROW. **Table 6.5.2-1** shows the length of tree clearing where the Proposed Alignment is parallel to existing roads and utilities (i.e., within the Route Width) and collocated with existing roads and utilities (i.e., within 50 feet either side of the Proposed Alignment). Trees are located on private property.

Table 6.5.2-1. Tree Clearing along Proposed Alignment

Utility / Road Type	Parallel (within Proposed Route) (miles)	Collocated with Proposed Alignment (miles)	Source
Electric Transmission / Distribution Lines	1.34	0.35	Minnesota Valley Distribution Lines (personal communication, February 2023); https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mngeo/util_elec_trans/metadata/metadata.html (2021)
Oil and Gas Pipelines	0.09	0.08	Proprietary information
Roads	2.02	0.07	https://mndot.maps.arcgis.com/apps/View/index.html?appid=ed7c29124e56472cbfba2d0cc3c557e2 (Undated)
Total (miles)	**3.45**	**0.50**	

Notes: Collocation is defined as any road or utility located within 50 feet either side of the Proposed Alignment based on the proposed clearing width.

Impacts and Mitigation

Because the Project will largely be collocated and parallel with existing utility and road ROWs, there will be minimal incremental impacts from the construction and maintenance of the Project. The ROW will need to be maintained for the safe and reliable operation of the transmission line. Mitigation measures for potential impacts to forest resources would be as follows:

- Compensation for the removal of vegetation in the ROW will be offered to landowners during easement negotiations.
- Landowners will be given the option to keep any portions of the trees (e.g., timber, branches, chips, shreds) cut within the easement area.

6.5.3 Tourism

Tourist destinations near the proposed route include the Cedar Lake Farm Regional Park, Creeksbend Golf Course, rivers, and lakes. Popular activities include fishing, boating, swimming, biking, hiking, camping, hunting, snowmobiling, and golfing.

Impacts and Mitigation

The Proposed Route avoids many of the areas that would be considered tourist destinations, and the Project would not preclude tourism activities or appreciably diminish the use or experience at tourist destinations. Minimal tree clearing may be required, but if it is, it would be adjacent to existing ROWs and should not affect wildlife viewing opportunities.

As no impacts on tourism are anticipated, no mitigation is proposed.

6.5.4 Mining

There is an active gravel mine located at 12668 New Prague Boulevard (a.k.a. 280th St E / State Highway 19) approximately 500 feet east of where the Proposed Alignment crosses over 280th St E / State Highway 19 (**page 2 of Appendix A).** According to MnDOT gravel pit and prospect mine data, there are three gravel pits in the vicinity of the Project; the active mine is not listed in the MnDOT data.[42] Two gravel pits are located approximately 1,800 and 3,000 feet west of the Proposed Route. One gravel pit is located approximately 4,600 feet north of the west side of the Proposed Route. Based on review of current aerial imagery and historical aerial imagery, no gravel pits appear to be present and active at these three locations. No other mining activity is present in the vicinity of the Project.

The Project will not inhibit ongoing mining activities at the mine located on New Prague Boulevard. As no impacts to mining are anticipated, no mitigation is proposed.

[42] https://www.dot.state.mn.us/materials/aggsource.html. Accessed May 17, 2023.

6.6 Archaeological and Historic Resources

A cultural resource literature review of the Proposed Route and a one-mile buffer was conducted by Merjent, Inc. (Merjent). This literature review and Merjent's evaluation of the possible effects of the proposed Project on historic properties in the Project Area was provided to the Minnesota SHPO in a letter dated May 10, 2023 (**Appendix D**[43]); SHPO response to this letter is pending. The following summarizes the results of the literature review.

On Friday, April 28, 2023, Merjent retrieved cultural resources site (i.e., archaeological sites and historic structures) and previous survey files from the SHPO. Merjent Cultural Resource Specialists reviewed archaeological site files on the OSA online portal, as well as the General Land Office (GLO) maps and available historical aerial photography accessed online through the OSA Portal.[44]

According to the OSA and SHPO files, there is one archaeological site that minimally intersects the Project Route. This site is an alpha site, meaning that it was identified by historic documentation and has not been verified in the field by a professional archaeologist. Due to the imprecise locational information of this site, alpha site boundaries are likely larger than they would be if the site was physically located. It is unlikely that this site would have intact deposits where it intersects the current Project given that the point of intersect is a small portion of an existing ROW.

There is one additional archaeological site within one mile of the Project; however, it is at least 1,000 feet from the Project Route. Due to distance, there will be no impact to this site. This site is described as a small lithic scatter initially identified in 2001.

Four historic buildings and structures are located within the Project Area, with one overlapping the Project Route. Trunk Highway 19 (i.e., 280th St E / State Highway 19) is a linear resource which the Project intersects at various points. Given that this is an aboveground transmission line, these intersections will not impact the resource. Poles supporting the existing Minnesota Valley distribution lines are visible from Trunk Highway 19. Because the Project is collocated and parallels existing utility and road ROWs, it will not result in an appreciable change in viewshed.

The remaining historic buildings and structures will not be impacted due to distance. The remaining buildings and structures include a farmstead, a log outbuilding associated with a farmstead, and a bridge.

Merjent reviewed nineteenth century GLO maps and notes on file with the Bureau of Land Management.[45] The GLO map of the Project Area illustrated conditions in 1870 as being prairie with many lakes and connecting streams and rivers. An unnamed trail is present near Cedar Lake. Aerial photographs from 1937 show that roads have been constructed and farms have been

[43] The maps provided to the SHPO are not included in the correspondence provided in **Appendix D** because they include sensitive cultural resource data protected by the Archaeological Resources Protection Act of 1979 (16 United States Code 470hh, as amended), and National Park Service and Related Programs (54 United States Code 300101, formerly known as the National Historic Preservation Act, 16 United States Code 470-1).

[44] OSA Portal. 2023. https://osa.gisdata.mn.gov/OSAportal. Accessed April 28, 2023.

[45] Bureau of Land Management General Land Office Records. 2023. https://glorecords.blm.gov/.

established with agricultural fields dominating the landscape. There is no trace of the GLO trail on historic aerials, by 1937 it had been superseded by roads and fields. Subsequent historic and modern aerial photographs show that the landscape of the Project Area has remained largely the same since that time, with roads being the main addition to the area.

Great River Energy requested feedback on the Project from the 11 federally recognized Tribes with geography within Minnesota and the Minnesota Indian Affairs Council in its Project notification letters sent in April 2023. To date, no Tribe has conveyed concerns regarding the Project. These correspondences are included in **Appendix D**.

Impacts and Mitigation

Two total archaeological sites and four historic buildings and structures were identified within the Project Area. There is potential for historic-era sites within the Project Area because the area has been inhabited at least since the 1930s; however, given that the Project is an overhead transmission line project proposed mostly within an already disturbed ROW, there is a low potential for intact historic sites. Given the lack of previous survey and that the Project Area will intersect an archaeological site and a historic structure, Great River Energy will conduct a Phase I Archaeological Reconnaissance of the final route.

If any archaeological sites are identified during placement of the poles along the permitted Route, construction work will be stopped and SHPO staff consulted as to how to proceed. If human remains are encountered during construction activities, all ground disturbing activity will cease, and local law enforcement will be notified per Minn. Stat. § 307.08.

6.7 Natural Environment

6.7.1 Air Quality

Criteria Pollutants

The Clean Air Act (42 USC 7401 et seq. as amended in 1977 and 1990) is the principal federal statute governing air pollution. Under the Clean Air Act, the USEPA set National Ambient Air Quality Standards (NAAQS) for six "criteria" pollutants considered harmful to public health and the environment: carbon monoxide (CO), ozone, NO2, sulfur dioxide (SO2), lead, particulate matter equal to or less than 10 microns in diameter (PM10), and fine particulate matter equal to or less than 2.5 microns in diameter (PM2.5). The NAAQS include primary standards that are designed to protect human health and secondary standards that are intended to protect public welfare, including visibility and damage to crops and vegetation.

The USEPA and state agencies operate a system of air quality monitoring stations. Data from these monitoring stations are compared to the NAAQS to categorize the air quality of a particular area. Regions of the country that do not meet the NAAQS are designated as "nonattainment" areas. Some areas of the country do not have extensive air quality monitoring networks and are considered "unclassifiable." Unclassifiable regions are presumed to be in attainment with the NAAQS. Both Rice and Scott counties are designated as in attainment or unclassifiable for the NAAQS (40 CFR Part 81.324).

Emissions Related to Construction

During construction, temporary air emissions will occur from the operation of construction equipment, vehicular traffic, and soil disturbance. Construction activities will be performed with standard heavy equipment such as backhoes, cranes, boom trucks, and assorted small vehicles over the course of a six-month period starting fall 2024.

Table 6.7.1-1 summarizes the estimated potential emissions of criteria pollutants from construction activities for the Project. Construction emissions are based on typical counts of diesel-fueled construction equipment, expected hours of operation, and estimated vehicle miles traveled. Detailed emission calculations are provided as **Appendix F**.

Table 6.7.1-1. Construction Emissions of Criteria Pollutants (tons per year)

Description	NOx	CO	VOC [a]	SO_2	PM_{10}	$PM_{2.5}$
Off-Road Engine Emissions	5.12	1.50	0.36	0.00	0.21	0.20
Unpaved Roads	--	--	--	--	1.58	0.16
Earthmoving	--	--	--	--	8.00	0.84
TOTAL	**5.12**	**1.50**	**0.36**	**0.00**	**9.79**	**1.21**

[a] Volatile organic compounds.

Emissions Related to Operation

The only potential air emissions from a transmission line result from corona, which may produce ozone and oxides of nitrogen. This can occur when the EF intensity exceeds the breakdown strength of the air. For a 115-kV transmission line, the conductor surface gradient is typically below the air breakdown level. As such, it is unlikely that any measurable emissions would occur from the conductor surface.

Impacts and Mitigation

Temporary and localized air quality impacts caused by construction vehicle emissions and fugitive dust from ROW clearing and construction are expected to occur. Exhaust emissions from diesel equipment will vary during construction but will be minimal and temporary. The magnitude of emissions is influenced heavily by weather conditions and the specific construction activity taking place. Appropriate dust control measures will be implemented, including but not limited to:

- Reduced speed limits on Mullen Road, which is unpaved, and water or other non-chloride-containing dust suppression applications;
- Water application to the right-of-way if erosion occurs during dry weather;
- Street sweeping where soils are tracked onto paved roads; and
- If the right-of-way is wet during construction activities, vehicle tracking of soil from the right-of-way will be minimized by using wooden or plastic matting at access points.

At the completion of construction activities, all construction-related air impacts would cease.

No impacts to air quality are anticipated due to the operation of the transmission line.

Greenhouse Gas Emissions

The State of Minnesota is taking significant action to reduce the amount of greenhouse gas emissions produced in the state. As of 2020, Minnesota has experienced a 23% reduction in greenhouse gas emissions across all industry sectors.[46]

Construction of the transmission line will result in temporary minor greenhouse gas emissions from fuel combustion in construction equipment, commuter vehicles, and delivery trucks. **Table 6.7.1-2** summarizes the estimated potential emissions of greenhouse gas from construction activities for the Project. Emissions are based on typical counts of diesel-fueled construction equipment, expected hours of operation, and estimated vehicle miles traveled. Detailed emission calculations are provided as **Appendix G**. At the completion of construction activities, all construction-related air impacts would cease.

Table 6.7.1-2. Preliminary Estimate: Greenhouse Gas Emissions

Description	CO_2 (Short Tons)	CH_4 (Short Tons)	N_2O (Short Tons)	CO_2e (Short Tons)
Off-Road Engine Emissions	171.49	0.01	0.00	172.07
Commuters and Delivery Vehicles	114.83	0.00	0.00	114.83
TOTAL	**286.32**	**0.01**	**0.00**	**286.90**

Notes:
CO_2 – carbon dioxide
CH_4 – methane; 1 short ton CH_4 = 25 short tons CO_2e
N_2O – nitrous oxide; 1 short ton N_2O = 298 short tons CO_2e
CO_2e – carbon dioxide equivalent
Source: 40 CFR 98 Table A-1: https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98#Table-A-1-to-Subpart-A-of-Part-98

The Project does not include expanded services or increased system capacity. As such, there will be no changes to upstream or downstream greenhouse gas emissions during operation of the transmission line.

Impacts and Mitigation

EPA's Greenhouse Gas Reporting Tool[47] shows emissions within Minnesota totaled 34,929,605 metric tons of carbon dioxide equivalent (CO_2e) (38,502,906 tons) in 2020. Accordingly, the preliminary estimate of Project greenhouse gas emissions identified here would be negligible.

[46] MPCA DOC. January 2023. Greenhouse gas emissions in Minnesota 2005-2020. Available online at: https://www.pca.state.mn.us/sites/default/files/lraq-2sy23.pdf.

[47] https://ejscreen.epa.gov/mapper/

Great River Energy will mitigate vehicle emissions by limiting vehicle idling to only times when necessary.

Climate Resiliency

Climate change is the change in global or regional climate patterns over time. Changes in average precipitation or temperature over years or decades may indicate climate change. Generally, Minnesota's climate already is changing will continue to do so. Noticeable effects into the future include warmer periods during winter and at night, increased precipitation, heavier downpours, increased summer heat, and the potential for longer dry spells.[48]

From 1895 to 2022, Scott County has experienced an increase in temperature of 0.17 degrees Fahrenheit (°F) per decade and an increase in precipitation of 0.36 inch per decade. During the same period, Rice County has experienced an increase in temperature of 0.15 °F per decade and an increase in precipitation of 0.61 inch per decade.[49]

Impacts and Mitigation

Climate change could result in an increased risk of flooding in the Project Area, increased temperatures, extreme weather events such as high winds, and excessive rainfall. The Project as proposed will be designed to withstand these changes and will increase reliability in the Project Area. Great River Energy is actively assessing risks to the reliable operation of its transmission system from the potential impacts of climate change and is working on opportunities to mitigate those risks. Over the last three years, Great River Energy has invested over $67 million dollars in transmission resiliency improvement projects.

6.7.2 Water Resources

Hydrologic features in the Project Area and along the Proposed Route are shown in **Figure 6-5**. Hydrologic features such as wetlands, lakes, rivers, and floodplains perform several important functions within a landscape, including flood attenuation, groundwater recharge, water quality protection, and wildlife habitat production. The Project lies within the Minnesota River - Shakopee watershed, in the northeast portion of the Minnesota River Basin.[50]

Groundwater

The MDNR divides Minnesota into six groundwater provinces. The Project is located in the South-central Province, which is characterized by fine-grained glacial sediment such as clay and silt. Sedimentary bedrock aquifers are common and frequently used, while only limited extents of surficial and buried sand aquifers are present.[51]

[48] https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html

[49] https://arcgis.dnr.state.mn.us/ewr/climatetrends

[50] https://www.dnr.state.mn.us/watersheds/map.html

[51] https://www.dnr.state.mn.us/groundwater/provinces/index.html

Lakes or Ponds

There are no lakes or ponds[52] crossed by the Proposed Alignment; however, two ponds are located within the Proposed Route (**Figure 6-5**). One pond is 165 feet south of the Proposed Alignment and south side of 280th St E / State Highway 19, just east of Kanabec Avenue (**page 3 of Appendix A**). The second pond[53] is located 65 feet north of the Proposed Alignment, north of 280th St E / State Highway 19 and between Panama Ave / County Highway 23 and Great River Energy's MV-EVX 115-kV transmission line (**page 3 of Appendix A**).

A number of lakes and ponds are also in close proximity to the Proposed Route. The next closest pond is located on the southern edge of the Proposed Route, south of 280th St E / State Highway 19, approximately 1,500 feet west of Kanabec Avenue (**page 2 of Appendix A**). The closest lake is Cedar Lake which is located approximately 1,200 feet north of the western end of the Proposed Route (**Figure 6-5**).

In addition, a large shallow, open water wetland community[54] is located at the northern edge of the Proposed Route, north of 280th St E / State Highway 19 and situated between Jackson Ave / Balsa Ave and Panama Ave / County Highway 23. This wetland community falls within the Scott County WPA **(page 3 of Appendix A)**.

The MDNR holds a flowage easement across portions of Township 113, Section 25, Range 23 south of Cedar Lake and west of Baseline Avenue in Scott County. In 1936, the MDNR Division of Waters purchased a flowage easement across these properties (**Figures 1-2 and 6-5**). MDNR has the right to flow waters on these properties but has no other management or ownership interest. Communication regarding this area is included in **Appendix D**.

Rivers and Streams

Rivers and streams intersect the Proposed Route at six locations[55] (**Figure 6-5**). Four rivers and streams intersect the Proposed Alignment (see **pages 1-3 of Appendix A**), and two additional stream segments are located within the Proposed Route but are not crossed by the Proposed Alignment (see **pages 1 and 2 of Appendix A**). All streams are unnamed tributaries to Sand Creek which is approximately 4,500 feet to the west at its closest point from the Proposed Route (**Figure 6-5**).

[52] MDNR Division of Fish & Wildlife – Fisheries Unit. DNR Hydrography Dataset. 4/13/2023. https://gisdata.mn.gov/dataset/water-dnr-hydrography

[53] MDNR. National Wetland Inventory for Minnesota. 5/23/2019. https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014

[54] MDNR. National Wetland Inventory for Minnesota. 5/23/2019. https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014

[55] MDNR Division of Fish & Wildlife – Fisheries Unit. DNR Hydrography Dataset. 4/13/2023. https://gisdata.mn.gov/dataset/water-dnr-hydrography

Public Waters

Public Waters are wetlands, water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minn. Stat. § 103G.005. The MDNR has regulatory jurisdiction over these waters, which are identified on the MDNR Public Waters Inventory maps.[56]

The Proposed Route intersects MDNR Public Waters at three locations[57] (**Figure 6-5)**. Two public waters cross the Proposed Alignment (**pages 1 and 3 of Appendix A**) and one additional public water meanders into and out of the Proposed Route approximately 110 feet from the Proposed Alignment (**page 2 of Appendix A**). The crossed public waters are watercourses that are unnamed tributaries to Sand Creek, which is also a Public Water Watercourse.

Impaired Waters

Section 303(d) of the Federal Clean Water Act requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of various impairments. The list, known as the 303(d) list, is based on violations of water quality standards and listed waters are described as "impaired." In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. There are no impaired waters crossed by the Proposed Route (**Figure 6-5**). The closest impaired waters[58] are Cedar Lake and Sand Creek. Cedar Lake is approximately 1,200 feet north of the Proposed Route and is listed as impaired for aquatic consumption and aquatic life due to mercury in fish tissue and nutrient/eutrophication biological indicators. Sand Creek is approximately 4,500 feet west of the Proposed Route and listed as impaired for aquatic life due to chloride, nutrient/eutrophication biological indicators, and turbidity.

Wetlands

Wetlands are important resources for flood abatement, wildlife habitat, and water quality. Wetlands that are hydrologically connected to the nation's navigable rivers are protected federally under Section 404 of the Clean Water Act. In Minnesota, wetlands are also protected under the Wetland Conservation Act.

The USFWS produced maps of NWI wetlands based on aerial photographs and Natural Resources Conservation Service (NRCS) soil surveys starting in the 1970s. The NWI data were further updated for the state of Minnesota through a multi-agency effort lead by the MDNR and were published in 2019.[59] Wetlands identified by the Minnesota NWI may be inconsistent with current wetland conditions; however, Minnesota NWI data is the most accurate and readily available database of wetland resources within the Project Area and were therefore used to identify wetlands occurring within the Proposed Route. This analysis was conducted prior to the U.S. Supreme Court's decision in *Sackett v. Envtl. Protection Agency*, which was released on May 25, 2023.

[56] https://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html

[57] MDNR Division of Ecological and Water Resources. Public Waters (PW) Basin and Watercourse Delineations. 6/10/2020. https://gisdata.mn.gov/dataset/water-mn-public-waters

[58] Minnesota Pollution Control Agency. Impaired Waterbodies. 5/4/2022. https://gisdata.mn.gov/dataset/env-impaired-water-2022

[59] https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html

Analysis of Project impacts to wetlands and related regulatory requirements may be updated based on that decision and any related agency guidance.

The Project Route crosses a number of discrete wetland communities and wetland complexes.[60] Wetland Cowardin classifications crossed include Palustrine Forested (PFO), Palustrine Scrub-Shrub (PSS), and Palustrine Emergent (PEM). The Proposed Alignment cumulatively crosses 1,530 feet (0.29 mile) of PFO wetland, 637 feet (0.12 mile) of PSS wetland, and 5,742 feet (1.09 miles) of PEM wetland (**pages 1-3 in Appendix A**).

Impacts and Mitigation

Groundwater

No impacts to groundwater in the Project Area are anticipated. Dewatering activities are not expected for this Project, and any effects on water tables would be localized and short term and would not affect hydrologic resources.

Lakes, Rivers, and Streams

There are no lakes crossed by the Proposed Route and the Proposed Route will not impact the MDNR's existing flowage easement south of Cedar Lake. Ponds and streams crossed by the Proposed Route are spaced such that construction activities will avoid impacts to those water resources. In addition, Great River Energy will utilize erosion and sediment control BMPs (e.g., silt fencing) to mitigate the potential for sediment to reach any streams or ponds adjacent construction activities.

Public Waters

The MDNR Public Waters Watercourses crossed by the Proposed Route are spaced such that construction activities will avoid impacts within the Ordinary High-Water Level of the Public Waters. In addition, Great River Energy will utilize sediment and erosion control BMPs (e.g., silt fencing) to mitigate the potential for sediment to reach any Public Waters from adjacent construction activities.

Impaired Waters

There are no impaired waters within the Project Area; therefore, there will be no impacts to impaired waters. Also, the Project is not anticipated to cause a water to be newly listed in the Project Area. There is minimal potential to increase turbidity due to sedimentation from construction activities because of the significant distance to any receiving waters. Great River Energy will utilize erosion and sediment BMPs (e.g., silt fencing) to mitigate the potential for sediments to reach any impaired waters.

[60] MDNR. National Wetland Inventory for Minnesota. 5/23/2019. https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014

Wetlands

Once construction of the Project is completed, there will be no significant impacts to wetlands because disturbed soil will be restored to previous conditions and the amount of land area converted to an impervious surface will only be associated with the cross-sectional area of the structures, which will be on the order of 200 square feet total for the Project. Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. Staging or stringing setup areas will not be placed within or adjacent to water resources to the extent practicable.

Wetland impact avoidance measures that will be implemented during design and construction of the transmission lines include spacing and placing the power poles at variable distances to span and avoid wetlands, where possible. The maximum distance that can be spanned is approximately 400 feet. The Proposed Alignment crosses six wetland areas[61] where the wetland distance exceeds 400 feet, which will require that a transmission pole be placed within the wetland. **Table 6.7.2-1** describes the span length and wetland community type of these six wetlands.

Table 6.7.2-1. Wetlands Crossed by the Project Alignment with Span Lengths longer than 400 feet

Wetland Community Type	Span Length (feet)	General Location	Appendix A Map Page
Forested/Emergent Wetland	580	Western end of Proposed Route along Baseline Ave	1
Emergent Wetland	449	Western end of Proposed Route along Baseline Ave	1
Emergent Wetland	1,127	South of 280th St E / State Highway 19 and west of Leroy Ave	2
Emergent Wetland	1,345	South of 280th St E / State Highway 19 east of Leroy Ave	2
Emergent Wetland	862	South of 280th St E / State Highway 19 and east of Jackson Ave / County Highway 52	3
Emergent / Scrub-Shrub	847	South of 280th St E / State Highway 19 and east of Jackson Ave / County Highway 52	3

Where it is not possible to span a wetland, several measures will be utilized to minimize impacts during construction:

- When possible, construction will be scheduled during frozen ground conditions.
- When construction during frozen ground conditions is not possible, construction mats (wooden or composite) will be used to protect wetland vegetation. Additionally, all-terrain construction vehicles may be used, which are designed to minimize impact to soils in damp areas.
- Construction crews will attempt to access wetlands with the least amount of physical impact to the wetlands.

[61] MDNR. National Wetland Inventory for Minnesota. 5/23/2019. https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014

- The structures will be assembled on upland areas before they are brought to the site for installation, when practicable.

If the final transmission line design cannot enable the Project to span discrete wetland segments, permanent impacts to wetlands will occur where a structure is located in the wetland (approximately five square feet of permanent impact per structure). Wetland vegetation will be restored in the disturbed areas following construction.

Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees will be removed throughout the entire ROW, including forested wetlands. These forested wetlands will undergo permanent vegetative changes within the ROW. As described in **Section 2.3.1**, Great River Energy, in consultation with the USACE, St. Paul District, will seek coverage under the Utility Regional General Permit once design of the transmission line is complete. Great River Energy has been assigned a Regulatory File No. (MVP-2017-01526-RMH) and a USACE Project Manager (**Appendix D**) for this Project.

6.7.3 Flora and Fauna

Flora

Flora can be generally characterized for the Project Area using the Ecological Classification System.[62] The system was developed by the MDNR and U.S. Forest Service for ecological mapping and landscape classification. The top three tiers of the system consist of Province, Section, and Subsection. The Project falls in the Eastern Broadleaf Forest Province, Minnesota & Northeast Iowa Morainal Section, and Big Woods subsection.

The Eastern Broadleaf Forest Province[63] serves "as a transition, or ecotone, between semi-arid portions of the state that were historically prairie and semi-humid mixed conifer-deciduous forests to the northeast. The western boundary of the province in Minnesota is sharply defined along much of its length as an abrupt transition from forest and woodland to open grassland."

The Minnesota and Northeast Iowa Morainal Section[64] "is a long band of deciduous forest, woodland, and prairie that stretches nearly 350 miles (560km) from Polk County in northwestern Minnesota to the Iowa border."

The Big Woods subsection[65] further details flora of the Project Area. Pre-settlement vegetation was comprised of oak woodland and maple-basswood forests with aspen dominated forest located along the western margin of the subsection. The current vegetation and land use is primarily made up of cropland (75%) and pasture (5-10%). The remaining areas of the subsection are comprised of upland forest or wetland.

[62] https://www.dnr.state.mn.us/ecs/index.html

[63] https://www.dnr.state.mn.us/ecs/222/index.html

[64] https://www.dnr.state.mn.us/ecs/222M/index.html

[65] https://www.dnr.state.mn.us/ecs/222Mb/index.html

There are no MDNR Scientific and Natural Areas in the Project Area.[66]

Fauna

The Project is located in the MDNR Nongame Wildlife – Central Region.[67] The Central Region provides habitat for non-game species such as tundra swans during migratory periods, red-headed woodpeckers, raptors, trumpeter swans, mice, turtles, frogs, and snakes. Additional species, as indicated by nearby WMAs,[68] include sandhill cranes and game species such as pheasants, deer, turkey, waterfowl, and other small game species.

There are no MDNR WMAs[69] crossed by the Project Route. The closest MDNR WMA is the St. Patrick's WMA, which is located approximately 1.6 miles to the northeast of the Proposed Route.

Great River Energy reviewed the USFWS National Realty[70] information and easement documents associated with the Scott County WPA managed by the Minnesota Valley Wetland Management District[71] located along 280th St E / Minnesota Highway 19 toward the end of the Proposed Route near Panama Avenue / County Highway 23. This WPA consists of three separate easements within a wetland area to the north of 280th St E / Minnesota Highway 19. Great River Energy has coordinated with the USFWS regarding this easement; this correspondence is provided in **Appendix D**. The Proposed Alignment avoids structure placement within this WPA.

Rare and natural flora and fauna are discussed in more detail in **Section 6.7.5.**

Impacts and Mitigation

Minimal impacts to native vegetation are anticipated. The Proposed Route will primarily follow existing road and distribution line corridors or be located in agricultural fields, which will minimize impacts to previously undisturbed vegetation in that area. As described in **Section 6.5.2**, Great River Energy will clear approximately 16.7 acres of trees within the 100-foot-wide ROW associated with the Proposed Alignment. Clearing will be minimized to the extent practicable. Great River Energy will prepare a Vegetation Management Plan for this Project (Appendix H, to be filed at a later date).

There is minimal potential for the displacement of wildlife and loss of habitat from construction of the Project. Wildlife that inhabits natural areas could be impacted in the short-term within the immediate area of construction. The distance that animals will be displaced will depend on the species. Additionally, these animals will be typical of those found in agricultural and forested settings and should not incur population level effects due to construction.

[66] https://www.dnr.state.mn.us/maps/compass/index.html

[67] https://www.dnr.state.mn.us/eco/nongame/central.html

[68] https://www.dnr.state.mn.us/maps/compass.html

[69] https://www.dnr.state.mn.us/maps/compass/index.html

[70] FWS National Realty Tracts | FWS National Realty Tracts | U.S. Fish & Wildlife Service GIS Data (arcgis.com)

[71] FWS National Realty Tracts | FWS National Realty Tracts | U.S. Fish & Wildlife Service GIS Data (arcgis.com)

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission lines. Waterfowl are typically more susceptible to transmission line collision, especially 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. Project design and construction will be done in accordance with Avian Power Line Interaction Committee (APLIC) guidelines. Any eagle or other migratory bird nests discovered during survey of the line or in the land acquisition process will be reported to the USFWS and Great River Energy will adhere to guidance provided.

6.7.4 Invasive Species Management

The movement of construction equipment to, from, and between various work sites has the potential to introduce and/or spread invasive species. Invasive and noxious species in Minnesota are regulated by the MDNR[72] and Minnesota Department of Agriculture (MDA).[73] Known invasive and noxious species that are regulated and within the Project Area include Canada thistle, common tansy,[74] non-native phragmites, and curly leaf pondweed.[75]

Impacts and Mitigation

To minimize the potential for the introduction or spread of invasive species, Great River Energy proposes to implement the following BMPs during Project construction:

- All disturbed areas will be revegetated using weed-free seed mixes. If practicable, native plant species will be used to revegetate disturbed areas. Weed-free straw or weed-free hay will be used for erosion control.
- Herbicidal or manual vegetation removal may be implemented to minimize the spread of invasive species where such removal is consistent with easement conditions or landowner restrictions.
- The ROW may be mowed before noxious weeds or invasive species go to seed.
- Construction vehicles will be cleaned and inspected to remove dirt, mud, plants, and debris from vehicles and equipment prior to arriving at, and leaving from, construction sites.
- The Construction Field Representative will oversee BMP installation and effectiveness.

These BMPs will be incorporated into Great River Energy's forthcoming Vegetation Management Plan for this Project (Appendix H, to be filed at a later date).

[72] https://www.dnr.state.mn.us/invasives/index.html

[73] https://www.mda.state.mn.us/plants-insects/noxious-invasive-weeds

[74] MDNR – Ecological and Water Resources. Terrestrial Invasive Species Observations. 4/27/2023. https://gisdata.mn.gov/dataset/env-invasive-terrestrial-obs

[75] MDNR – Ecological and Water Resources. 4/27/2023. Aquatic Invasive Species. https://gisdata.mn.gov/dataset/env-invasive-aquatic-obs

6.7.5 Rare and Unique Natural Resources

Threated and Endangered Species

Great River Energy submitted a formal Natural Heritage Review Request (2022-00769) on April 12, 2023, through the MDNR's MCE, which is included in **Appendix D**.

In addition, Great River Energy reviewed the USFWS IPaC website[76] for a list of federally threatened and endangered species, candidate species, and designated critical habitat that may be present within the Project Area.

State-Listed Species

Great River Energy's consultant, Merjent, consulted the MDNR Natural Heritage Inventory System data through License Agreement LA 1066 on February 15, 2022, and did not identify any features within 1 mile of the Proposed Route. Great River Energy also submitted a review request through the MDNR's Minnesota Conservation Explorer (MCE) online application review process (https://mce.dnr.state.mn.us/). An automated response provided by the MDNR on April 12, 2023, indicated that the Project will not negatively affect any known occurrences of rare features. The response is provided in **Appendix D.**

Federally Listed Species

Based on the official species list provided by the USFWS (**Appendix D**), one species federally listed under Endangered Species Act (ESA), one species proposed for listing, and one candidate species have been previously documented within the vicinity of the Project (**Table 6.7.5-1**). No federally designated critical habitat is present within the Project Area.

Table 6.7.5-1. Federally Protected Species within the Project Area

Common Name	Scientific Name	Federal Status
Northern long-eared bat	*Myotis septentrionalis*	Endangered
Tricolored bat	*Perimyotis subflavus*	Proposed Endangered
Monarch butterfly	*Danaus plexippus*	Candidate

Northern Long-eared Bat

The range of the northern long-eared bat (NLEB) stretches across much of the eastern and midwestern United States. During summer, the bats roost singly or in colonies under bark, in cavities, or in crevices of both live and dead trees. Males and non-reproductive females may also roost in cooler places such as caves and mines. This species is thought to be opportunistic in selecting roosts, using tree species based on the tree's ability to retain bark or provide cavities or

[76] Information for Planning and Conservation (IPaC) Website. Available online at: https://ecos.fws.gov/ipac/. Accessed April 2023.

crevices. It has also been found, rarely, roosting in structures such as barns and sheds. In winter, NLEBs use caves and mines as hibernacula.[77]

Tricolored Bat

The tricolored bat is one of the smallest bats species native to North America. The species overwinters in caves and mines where available. However, throughout much of its range in the southern United States, roadside culverts, tree cavities, and abandoned water wells may also serve as suitable overwintering habitat.

During the active season (generally, April 1 to October 31), the species may be found roosting among leaf clusters (live and dead) on living or recently dead deciduous hardwood trees. Roost choice may also vary by region and this species has been observed roosting in eastern red cedar trees and pine needles, as well as within manufactured structures such as barns and bridges.[78]

On September 13, 2022, the USFWS published a proposed rule listing the tricolored bat as federally endangered under the ESA. A final rule is expected in October 2023.[79]

Monarch Butterfly

The monarch butterfly is a large butterfly with an approximate 3-4-inch wingspan and characterized by bright orange coloring on the wings, with distinctive black borders and veining. The species can be found in a wide variety of habitats including prairies, grasslands, urban gardens, road ditches, and agricultural fields, provided a supply of nectaring plants are available for adult foraging and milkweed plants are present for laying eggs and as a food source for caterpillars.[80]

On December 17, 2020, the USFWS published the result of its 12-month review of the monarch butterfly and determined that listing the species under the ESA was "warranted but precluded," meaning the species meets the criteria for listing as an endangered or threatened species, but the USFWS cannot currently implement the listing because there are other listing actions with a higher priority. The species is now a candidate for listing; however, candidate species are not protected under the ESA.[81] The USFWS has added the monarch to the updated national listing workplan and based on its listing priorities and workload, intends to propose listing the monarch in Fiscal Year 2024, if listing is still warranted at that time, with a possible effective date within 12 months of the proposed rule. The USFWS will also conduct an annual status review to determine if changes in prioritization are necessary.

[77] USFWS. Northern Long-eared Bat. Available online at: https://www.fws.gov/species/northern-long-eared-bat-myotis-septentrionalis. Accessed April 2023.

[78] USFWS. Tricolored Bat. Available online at: https://www.fws.gov/species/tricolored-bat-perimyotis-subflavus.

[79] USFWS. Service proposes to list the tricolored bat as endangered under the Endangered Species Act. Available online at: https://www.fws.gov/press-release/2022-09/proposal-list-tricolored-bat-endangered.

[80] USFWS. Monarch Butterfly. Available online at: https://www.fws.gov/species/monarch-butterfly-danaus-plexippus.

[81] USFWS. Endangered and Threatened Wildlife and Plants; 12-Month Finding for the Monarch Butterfly. 85 Federal Register 81813 (December 17, 2020).

Impacts and Mitigation

Northern Long-eared Bat

Based on the USFWS Determination Key (DKey) for the NLEB, the Project "may affect, but is not likely to adversely affect*"* the species (**Appendix D).** With that determination of effect, a "Consistency Letter" (**Appendix D**) was generated. Great River Energy will commit to the minimization and avoidance measures outlined in the DKey; therefore, no impacts are anticipated.

Tricolored Bat

Potential impacts to individual tricolored bats may occur if clearing or construction takes place when the species is roosting in its summer habitat, in trees outside of hibernacula. Bats may be injured or killed if occupied trees are cleared during this active window. Tree clearing activities conducted when the species is in hibernation and not present on the landscape will not result in direct impacts to individual bats but could result in indirect impacts due to removal of suitable roosting habitat.[82]

Monarch Butterfly

Suitable habitat for monarchs may be present within the Project area. If the USFWS determines the species should be listed and protections for the species coincide with Project planning, permitting, and/or construction, Great River Energy will review Project activities for potential impacts to the species and develop appropriate avoidance and mitigation measures.

Constructing within and/or adjacent to an existing utility ROW minimizes impacts to habitat in this area. Great River Energy will continue to coordinate with the MDNR and USFWS to avoid and minimize Project impacts on sensitive species.

The following general measures will be used to help avoid or minimize impacts to area wildlife and rare natural resources during and after the completion of the proposed transmission line:

- BMPs will be utilized to prevent erosion of the soils in the areas of impact.
- Sound water and soil conservation practices will be implemented during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil, and stabilizing restored soil.
- Disturbed areas will be re-vegetated with native species and wildlife conservation species, where applicable if the landowner agrees.

[82] USFWS. Species Status Assessment Report for the Tricolored Bat (*Perimyotis subflavus*). Available online at: https://ecos.fws.gov/ServCat/DownloadFile/221212.

- Raptor protection measures will be implemented, including following APLIC Avian Safe Design recommendations and placement of bird flight diverters on the line after consultation with USFWS.

6.8 Physiographic Features

6.8.1 Topography

The Proposed Route occurs over generally flat terrain with periodic rolling hills that rise in elevation approximately 50 – 100 feet (**Figure 6-6** and **Appendix A**).

Impacts and Mitigation

Construction of the Project will not alter the topography along the Proposed Alignment; therefore, no mitigation is proposed.

6.8.2 Geology

The Big Woods subsection[83] of the Ecological Classification indicates that for bedrock geology the depth of glacial sediment to bedrock varies from 100 to 400 feet. The Project Route is located in the southern half of the subsection and, as such, underlying bedrock includes Ordovician and Cambrian sandstone, shale, and dolomite. Cretaceous shale, sandstone, and clay underly the bedrock further to the north.

Impacts and Mitigation

Few geological constraints on design, construction, or operation are anticipated in the Project Area. Based on typical soil types in Minnesota, it is anticipated that the above ground pole will be buried approximately 13 feet into the ground, which will not impact subsurface geologic features. Construction of the Project will not alter the geology along the routes; therefore, no mitigation is proposed.

6.8.3 Soils

The Big Woods subsection[84] of the Ecological Classification states that the soils are dominantly loamy, with textures ranging from loam to clay loam. The parent material is glacial till and are classified primarily as Alfisols. Alfisols are soils developed under forests.

USDA NRCS STATSGO2 data were reviewed to describe soil resources in the Project Area. The STATSGO2 Database[85] is also referred to as the Digital General Soil Map of the United States and is a broad-based inventory of soils for use in broad planning. Soils are organized by general association units which are derived from more detailed soil survey maps. The general association units were determined by transecting or sampling areas on the detailed maps and then statistically expanding the data to characterize the whole map unit. Each association unit represents a

[83] https://www.dnr.state.mn.us/ecs/222Mb/index.html

[84] https://www.dnr.state.mn.us/ecs/222Mb/index.html

[85] https://www.nrcs.usda.gov/resources/data-and-reports/description-of-statsgo2-database

distinctive pattern of soils, relief, and drainage, and is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. There are two soil association units that intersect the Proposed Route. These soil associations are listed in **Table 6.8.3-1** and shown in **Figure 6-6**.

Table 6.8.3-1. Soil Associations in the Project Area

Soil Association[86]	General Description[87]
Lester-Le Sueur-Cordova (s3503)	**Lester-Le Sueur-Cordova** association unit is characterized as very deep, well drained soils to poorly drained soils that formed in calcareous, loamy till. They are found in areas ranging from lower landscape positions on flats and upper drainageways to convex slopes on moraines and till plains. Slopes range from 1 to 70 percent.
Lerdal-Kilkenny-Hamel (s3617)	**Lerdal-Kilkenny-Hamel** association unit is characterized as very deep, poorly drained to moderately well drained soils that formed in clayey glacial till or flow till and underlying loamy glacial till on glacial moraines. They are found in gently sloping to moderately steep areas and in areas with convex slopes on higher lying terrain. Slopes range from 1 to 35 percent.

Impacts and Mitigation

Potential impacts of construction are compaction of the soil associated with construction equipment traffic and exposing the soils to wind and water erosion. Soil compaction within wetlands would be mitigated by installation of construction mats, and as described in **Section 5.6**, the restoration contractor would take measures to alleviate soil compaction where needed. As described in **Section 5.5**, ground disturbance and soil exposure would be primarily limited to the pole locations, which would typically consist of a 10- to 15-foot-deep hole between 2 to 4 feet in diameter. Impacts to physiographic features should be minimal during and after installation of the transmission line structures, and these impacts will be short term. There should be no long-term impacts resulting from this Project.

Erosion and sediment control methods and BMPs will be utilized to minimize runoff during line construction. Such BMPs may include but are not limited to the installation of sediment barriers (silt fence, straw bales, bio-logs), filter socks, mulch, upslope diversions, slope breakers. As described in **Section 5.6**, exposed soils will also be revegetated as soon as possible to minimize erosion. Great River Energy will also develop a Vegetation Management Plan for this Project (Appendix H, to be filed at a later date).

Project construction is not anticipated to result in the disturbance of more than one acre of soils. As discussed in **Section 2.3.2**, if more than one acre of soil will be disturbed during the construction of the transmission line, Great River Energy will obtain a NPDES construction stormwater permit from the MPCA and will prepare a SWPPP.

Long-term impacts to soils are not anticipated, and no impact from Project operations are expected.

[86] USDA NRCS. Digital General Soil Map of the U.S. (STATSGO2). 10/13/2016. https://gisdata.mn.gov/dataset/geos-statsgo2

[87] https://www.nrcs.usda.gov/resources/data-and-reports/official-soil-series-descriptions-osd

6.9 Summary of Potential Environmental Effects

Great River Energy analyzed the potential environmental effects of the proposed Project. Generally, Project effects are anticipated to be temporary and/or minor. No homeowners will be displaced by the Project. All land impacted during construction will be restored to the extent possible, and landowners will be compensated for any crop losses due to construction operations or structure and conductor placement. The EFs associated with the new line (1.2 kV/m) will be significantly less than the maximum levels permitted by state regulators (8 kV/m). No stray voltage issues are anticipated. Similarly, Project facilities will comply with applicable noise standards. The Project will parallel existing roads, electric distribution lines, and pipeline ROW for much of its length. The routing of the Project minimizes potential tree removal but may require the permanent removal of approximately 16.7 acres of trees within its ROW. There are wetlands within the proposed transmission line ROW. Great River Energy prefers to span wetlands, but there are six wetlands along the Proposed Route that likely cannot be spanned because the wetland complexes exceed the typical span length of 400 feet. In addition, sometimes stakeholder requests may preclude the design from avoiding some wetlands. Unavoidable impacts include a change in aesthetics and the presence of additional traffic during construction on the local roads. These and other potential environmental effects, as well as applicable avoidance and minimization measures, are described in more detail in **Chapter 6** of this Application.

The EERA is responsible for environmental review of the Project and will prepare an EA that analyzes the Project's potential environmental impacts.

6.10 Unavoidable Impacts

Minnesota Rule 7850.1900, subpart 3(G) requires that an application discuss "human and environmental effects that cannot be avoided if the facility is approved at a specific site or route." The Project will be designed, constructed, and operated using processes and procedures, as described in this Application, which will avoid, minimize, and mitigate potential impacts. There will nevertheless be nominal impacts that cannot be avoided. The nominal impacts from construction activities will include soil compaction and erosion, short-term traffic delays, vegetative clearing, wetland conversion, visual impacts, habitat loss, temporary disturbance and displacement of wildlife, and loss of land use for other purposes. The nominal impacts from operations will include the continued maintenance of tall growing vegetation, conversion of agricultural land, visual impacts, interference with AM radio signals, and individual wildlife impacts from habitat reduction and avian collisions.

The Project will require only minimal commitments of resources that are irreversible and irretrievable. Irreversible commitments of resources are those that result from the use or destruction of a specific resource that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments are those that result from the loss in value of a resource that cannot be restored after the action. For the Project, those commitments that do exist are primarily related to construction. Construction resources will include aggregate resources, concrete, steel, and hydrocarbon fuel. During construction, vehicles necessary for these activities will be deployed on site and will need to travel to and from the construction area, consuming hydrocarbon fuels. Other resources will be used in pole construction, pole placement, and other construction activities.

6.11 Cumulative Effects

Cumulative potential effects are impacts on the environment that result from "the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectations have been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects."[88]

Consideration of cumulative potential effects is intended to aid decision-makers so that they do not make decisions about a specific project in a vacuum. Effects that may be minimal in the context of a single project may accumulate and become significant when all projects are considered.

A review of foreseeable projects (federal, state, or local unit of governments) in the Project area or along the transmission route that may affect, or be affected by, the proposed Project was conducted including projects identified by the MnDOT,[89] MPCA,[90] Scott County,[91] and Rice County.[92] Great River Energy also coordinated with Xcel Energy and Minnesota Valley to determine if there are any other additional potential transmission or distribution projects in this area.

Current and reasonably foreseeable future projects within the Project Area are summarized in **Table 6.11-1** and shown in **Figure 6-7**. Great River Energy plans to commence construction of the Project in fall 2024 once required permits and approvals are obtained. Great River Energy anticipates construction will take place over eight months and the Project will be energized in summer 2025.

Table 6.11-1. Current and Reasonably Foreseeable Projects

Project Name / Responsible Agency	General Location	Anticipated Timing	General Description	Reference
Jackson Ave / County Road 52 (Rice County)	Near the connection point of the Proposed Project with Great River Energy's MV-EVX line, intersects with 280th St E / State Highway 19	Rice County anticipates completion by October 2023	Paving of Jackson Ave / County Road 52	Rice County Highway Dept. 2023 Maintenance & Construction Plan: https://www.ricecountymn.gov/172/Maps
Great River Energy Removal of 115-kV MV-CDT transmission line	North of the Project area on the existing CapX2020 structures that run east-west along 260th St E	Anticipate completion by August 2025	Involves the removal of 4.5 miles of the 115-kV transmission line on the CapX2020 structures	Great River Energy (see **Chapter 1**)

[88] Minn. R. 4410.0200, subp. 11a.

[89] Construction Projects, Plans, and Studies on Minnesota Highways - MnDOT (state.mn.us)

[90] Local sites and projects | Minnesota Pollution Control Agency (state.mn.us)

[91] Construction Projects | Scott County, MN (scottcountymn.gov), Future Projects & Studies | Scott County, MN (scottcountymn.gov)

[92] Rice County Highway Dept. 2023 Maintenance & Construction Plan (arcgis.com)

Project Name / Responsible Agency	General Location	Anticipated Timing	General Description	Reference
CapX2020 2nd Circuit	North of the Project area on the existing CapX2020 structures that run east-west along 260th St E	Anticipate completion by August 2025	String the 2nd 345-kV transmission line (2nd circuit) on the existing CapX2020 structures	Consultation with Xcel Energy
Minnesota Valley Burial of Distribution Lines	Along Baseline Ave and along 280th St E / State Highway 19	Summer 2024	Burial of distribution lines where the Project overtakes the existing lines	Consultation with Minnesota Valley

6.11.1 Human Settlements

Cumulative potential effects on human settlements are anticipated to be minimal. The current and reasonably foreseeable projects occurring in the Project Area are primarily maintenance of existing infrastructure, as is the case of the Minnesota Valley burial of existing lines and Rice County Road paving projects. Great River Energy's removal of the existing 4.5-mile 115-kV MV-CDT transmission line from Xcel Energy's CapX2020 structures and Xcel Energy's subsequent stringing of the second 345-kV circuit on the CapX2020 structures will not require the installation of any additional infrastructure in the Project Area. Impacts will be temporary and minor associated with the short-term construction activity to remove the old line and string the new line.

6.11.2 Public Health and Safety

Cumulative potential effects on public health and safety as a result of the Project are anticipated to be minimal (see **Section 6.3**). The current and reasonably foreseeable projects include infrastructure maintenance and improvement projects being undertaken to ensure safe operation of the infrastructure and the public's health and safety.

6.11.3 Land-Based Economies

Cumulative potential effects on land-based economies are anticipated to be minimal. These projects are maintenance and infrastructure improvements occurring within existing utility and road ROWs.

6.11.4 Natural Environment

Cumulative potential effects on the natural environment are anticipated to be minimal. These projects are maintenance and infrastructure improvements occurring within existing utility and road ROWs.

6.11.5 Rare and Unique Natural Resources

Cumulative potential effects on rare and unique natural resources are anticipated to be minimal. These projects are maintenance and infrastructure improvements occurring within existing utility and road ROWs.

7 APPLICATION OF RULE CRITERIA

7.1 Route Permit

According to Minn. Stat. § 216E.02, subd. 1, it is the policy of the state of Minnesota to locate HVTLs in an orderly manner that minimizes adverse human and environmental impacts and ensures continuing electric power system reliability and integrity. The Commission has promulgated standards and criteria for issuing Route Permits (Minn. R. 7850.4000). That rule provides that the Commission shall issue Route Permits for HVTLs that are consistent with state goals to conserve resources, minimize environmental impacts and impacts to human settlement, minimize land use conflicts, and ensure the state's electric energy security through efficient, cost-effective transmission infrastructure. The Project addresses these criteria:

- The Project is consistent with state goals to conserve resources because the majority of the Project is proposed to be routed along existing utility, pipeline, and road ROWs, thus avoiding and minimizing potential additional impacts to the extent practicable.

- The Project will minimize environmental impacts because:

    - The majority of the Project is proposed to be routed along existing utility, pipeline, and road ROWs, which will avoid and minimize potential impacts on vegetation and wildlife.

    - Great River Energy will develop its final alignment based on the permitted route to further avoid and minimize impacts to environmental resources, in compliance with federal, state, and local regulations and in coordination with applicable federal, state, and local agencies.

    - Great River Energy will design the final alignment to avoid or span as many wetlands as practicable.

- Great River Energy will implement construction, restoration, and operation and maintenance procedures and BMPs to further avoid and minimize impacts to environmental resources. The Project will minimize impacts on human settlement and other land use conflicts because:

    - It is proposed to generally be routed along utility, pipeline, and road ROWs and/or routed along property boundaries, thus avoiding impacts to new landowners and parcels.

    - Great River Energy will develop its final alignment based on landowner and stakeholder input to avoid and minimize impacts to residents and business owners along the final route.

- Disturbed areas will be restored to their original condition to the maximum extent practicable and Great River Energy will negotiate compensation with landowners for unavoidable impacts.

- The Project is consistent with state goals to ensure electric energy security because it will help ensure continued reliable and secure electrical service to the existing Cedar Lake Substation and will accommodate the installation of a new 345-kV circuit on the existing CapX2020 line.

7.2 Conclusion

Great River Energy respectfully requests that the Commission issue a Route Permit for the proposed Project in Scott and Rice Counties, Minnesota.