

GREAT RIVER ENERGY AND MEEKER ENERGY

APPLICATION TO THE MINNESOTA PUBLIC UTILITIES COMMISSION
FOR A ROUTE PERMIT AND ENVIRONMENTAL ASSESSMENT FOR THE

KIMBALL SUBSTATION AND 115-KV TRANSMISSION LINE PROJECT IN STEARNS AND MEEKER COUNTIES, MINNESOTA

DOCKET NO. ET2, E121 / TL-26-182



September 2026

THIS PAGE INTENTIONALLY BLANK

TABLE OF CONTENTS

1.	INTRODUCTION	1
1.1.	Great River Energy and Meeker Energy Background	1
1.2.	Project Ownership.....	4
1.3.	Permittees and Project Contacts.....	4
1.4.	Project Location	4
1.5.	Proposed Project	5
1.6.	Project Need and Purpose	8
1.7.	Summary of Potential Human and Environmental Impacts	8
1.8.	Preapplication Coordination and Public Involvement	9
1.8.1.	Public Involvement	9
1.8.2.	Preapplication Coordination	9
2.	REGULATORY PROCESS	14
2.1.	Certificate of Need Not Required	14
2.2.	Route Permit	14
2.3.	Standard Review Process.....	14
2.3.1.	Application Preparation	14
2.3.2.	Preapplication Coordination	14
2.3.3.	Application Notice	15
2.3.4.	Public Information & Scoping Meeting.....	15
2.3.5.	Draft Route Permit.....	15
2.3.6.	EA Addendum	16
2.3.7.	Public Hearing	16
2.3.8.	Timing.....	16
2.4.	Other Permits/Approvals	16
2.4.1.	Federal Approvals.....	18
2.4.2.	State of Minnesota Approvals.....	18
2.4.3.	Local Approvals.....	21
3.	PROPOSED PROJECT	22
3.1.	Transmission Line.....	22
3.1.1.	Proposed Route	22
3.1.2.	Proposed Alignment.....	23
3.1.3.	Proposed Right-of-Way	23
3.1.4.	Temporary Easements.....	24
3.1.5.	Transmission Line.....	25
3.1.6.	Transmission Line Clearance Requirements	25
3.1.7.	Outages	25
3.1.8.	Distribution Lines	26
3.1.9.	Reliability.....	26
3.1.10.	Service Life.....	26
3.1.11.	Design Considerations to Accommodate Future Needs	26
3.2.	Substation.....	27
3.2.1.	Substation Site and Design Considerations	27
3.3.	Safety Equipment and Plans	28
3.4.	Estimated Costs.....	28

3.5.	Project Schedule.....	29
3.6.	Work Force Required.....	29
3.7.	Construction and Restoration Practices	30
3.8.	Operation and Maintenance Practices.....	30
4.	ALTERNATIVE ROUTES CONSIDERED AND REJECTED.....	31
4.1.	Alternative Requirement.....	31
4.2.	Route Alternatives Considered but Rejected	31
4.2.1.	Human and Environmental Impact Considerations	33
4.3.	Conclusions.....	34
5.	ENGINEERING, OPERATIONAL DESIGN, CONSTRUCTION, AND RIGHT-OF-WAY ACQUISITION	35
5.1.	Transmission Line.....	35
5.1.1.	Structure Design.....	35
5.1.2.	Conductors	38
5.1.3.	Right-of-Way Acquisition Procedures.....	38
5.1.4.	Final Design and Construction Procedures.....	39
5.1.5.	Restoration Procedures	41
5.1.6.	Operation and Maintenance	42
5.2.	Kimball Substation.....	44
5.2.1.	Design and Land Requirements	44
5.2.2.	Land Acquisition Procedures	44
5.2.3.	Construction Procedures	44
5.2.4.	Restoration Procedures	44
5.2.5.	Operation and Maintenance	44
6.	ENVIRONMENTAL ASSESSMENT	45
6.1.	Methodology and Definitions	45
6.2.	Regions of Influence	46
6.3.	Environmental Setting	48
6.4.	Human Settlement.....	48
6.4.1.	Aesthetics.....	48
6.4.2.	Cultural Values	50
6.4.3.	Displacement.....	51
6.4.4.	Environmental Justice.....	52
6.4.5.	Land Use and Zoning.....	55
6.4.6.	Noise	58
6.4.7.	Public Services and Transportation	62
6.4.8.	Recreation	66
6.4.9.	Socioeconomics	67
6.4.10.	Property Values.....	71
6.5.	Public Health and Safety.....	73
6.5.1.	Interference	73
6.5.2.	Electric and Magnetic Fields	74
6.5.3.	Emergency Services.....	81
6.5.4.	Public and Worker Safety	83
6.6.	Land-based Economies	84
6.6.1.	Agriculture	84

6.6.2.	Forestry	88
6.6.3.	Mining.....	88
6.6.4.	Tourism	89
6.7.	Archaeological and Historic Resources	89
6.7.1.	Potential Impacts.....	90
6.7.2.	Mitigation Measures	90
6.7.3.	Typical Route Permit Conditions.....	91
6.8.	Natural Environment.....	91
6.8.1.	Air Quality	91
6.8.2.	Climate Change and Resilience	93
6.8.3.	Greenhouse Gas Emissions.....	95
6.8.4.	Geology and Topography	97
6.8.5.	Rare and Unique Natural Resources	98
6.8.6.	Soils.....	105
6.8.7.	Vegetation.....	109
6.8.8.	Surface Waters and Wetlands	111
6.8.9.	Groundwater	116
6.8.10.	Wildlife and Habitat.....	118
6.9.	Unavoidable Impacts	122
6.10.	Irreversible and Irretrievable Impacts	123
6.11.	Cumulative Impacts	123
7.	REFERENCES	125

LIST OF TABLES

Table 1	Townships, Ranges, and Sections Crossed by the Proposed Route.....	5
Table 2	Summary of Permits, Licenses, Approvals, and Consultations	17
Table 3	NESC Clearance Requirements for 115-kV Transmission.....	25
Table 4	Estimated Project Costs	29
Table 5	Anticipated Project Schedule.....	29
Table 6	Comparison of Proposed and Alternative Alignments	33
Table 7	Wetland Types Crossed by the Proposed and Alternative Alignments	34
Table 8	NLCD Land Cover Types Crossed by the Proposed and Alternative Alignments.....	34
Table 9	Typical 115-kV Structure Dimensions	35
Table 10	Regions of Influence	47
Table 11	Buildings within the Proposed Route and Proposed ROW	52
Table 12	Environmental Justice Data	54
Table 13	Common Noise Sources and Levels	59
Table 14	Noise Limits by Noise Area Classification (dBA)	59
Table 15	Noise-sensitive Receptors from Transmission Line	60
Table 16	Anticipated Transmission Line Noise Levels in Heavy Rain.....	61
Table 17	Highways or Roads Crossed by the Proposed ROW	64
Table 18	Population and Economic Profile	68
Table 19	Magnetic Fields of Common Electric Appliances (mG)	76
Table 20	Calculated Electric Fields (kV/M) at One Meter Above Ground	78
Table 21	Calculated Magnetic Fields (mG) for Proposed Design	79
Table 22	Days in Each Air Quality Index Category (St. Cloud, MN).....	92
Table 23	Construction Emission of Criteria Pollutants (tons)	93
Table 24	Preliminary Estimate of Construction Greenhouse Gas Emissions, in Short Tons.....	96
Table 25	State Protected Species within One Mile of the Project Study Area	99
Table 26	Federally Protected Species within the Project Area.....	100
Table 27	Summary of Soil Characteristics	107
Table 28	Wetlands within the Proposed Route.....	114
Table 29	Wetlands Crossed by the Proposed Alignment.....	114
Table 30	CWI Wells within the Proposed Route	117
Table 31	Birds of Conservation Concern Potentially Present in the Local Vicinity	120

LIST OF FIGURES

Figure 1	Project Overview	2
Figure 2	Great River Energy and Meeker Energy Service Territories.....	3
Figure 3	Kimball Substation Preliminary Site Plan	7
Figure 4	Arrangement of the Route Width, Right-of-Way, and Alignment	22
Figure 5	Arrangement of Road Right-of-Way Relative to Transmission Line Easement	24
Figure 6	Photos of 115-kV Structures with 3-Phase Distribution Underbuild.....	27
Figure 7	Rejected Route Alternative	32
Figure 8	Photos of 115-kV Transmission Structures	36
Figure 9	Standard Tree Removal Practices during Transmission Line Operations	43
Figure 10	Census Tracts	53
Figure 11	Landcover (NLCD)	57
Figure 12	Existing Infrastructure	63
Figure 13	Jobs by Industry in Meeker and Stearns Counties, 2024	70
Figure 14	Calculated Electric Field Profile	79
Figure 15	Calculated Magnetic Field Profile	80
Figure 16	Organic Farming Operations.....	85
Figure 17	Water Resources	112

LIST OF APPENDICES

Appendix A	Application Completeness Checklist
Appendix B	Detailed Route Maps
Appendix C	Public Outreach
Appendix D	Agency Correspondence
Appendix E	Tribal Correspondence
Appendix F	Minnesota Public Utilities Commission Draft Application Review Comments and Applicants' Response
Appendix G	List of Landowners
Appendix H	Agricultural Impact Mitigation Plan
Appendix I	Draft Vegetation Management Plan
Appendix J	Greenhouse Gas Emission Calculations
Appendix K	Geographic Information System (GIS) References

LIST OF ABBREVIATIONS

AIMP	Agricultural Impact Mitigation Plan
ALJ	administrative law judge
APLIC	Avian Power Line Interaction Committee
alignment	The general path a transmission line will follow
Applicants	Great River Energy and Meeker Energy
Application	Route Permit Application
AQI	Air Quality Index
ARMER	Allied Radio Matrix for Emergency Response
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMPs	best management practices
BWSR	Minnesota Board of Water and Soil Resources
CFR	Code of Federal Regulations
CH ₄	methane
CO	carbon monoxide
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
Commission or MPUC	Minnesota Public Utilities Commission
CWI	County Well Index
dBA	decibel – A weighted
DEED	Minnesota Department of Employment and Economic Development
EA	Environmental Assessment
EF	electric field
EMF	electromagnetic field
EMS	Emergency Medical Services
EQB	Minnesota Environmental Quality Board
ESA	Endangered Species Act
FAA	Federal Aviation Administration
G	gauss
GLO	General Land Office
GHG	greenhouse gas
HVTL	high voltage transmission line
IPaC	Information for Planning and Consultation
kV	kilovolt
kV/m	kilovolts per meter
L ₅	the dBA not to be exceeded over 5 percent of the time within an hour
L ₁₀	the dBA not to be exceeded over 10 percent of the time within the hour

L ₅₀	the dBA not to be exceeded over 50 percent of the time within an hour
MBS	Minnesota Biological Survey
MCE	Minnesota Conservation Explorer
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
ME-BW	Great River Energy's existing 115-kV Big Swan to Wakefield transmission line
Merjent	Merjent, Inc.
MF	magnetic fields
mG	milligauss
MGS	Minnesota Geological Survey
MIAC	Minnesota Indian Affairs Council
Minn. R.	Minnesota Rules
Minn. Stat. §	Minnesota Statutes Section
MISO	Midcontinent Independent System Operator
MnDOT	Minnesota Department of Transportation
MP	milepost
mph	miles per hour
MPCA	Minnesota Pollution Control Agency
MRO	Midwest Reliability Organization
N ₂ O	nitrous oxide
NAC	Noise Area Classifications
NAAQS	National Ambient Air Quality Standards
NESC	National Electrical Safety Code
NHIS	Natural Heritage Inventory System
NIEHS	National Institute of Environmental Health Sciences
NO ₂	nitrogen dioxide
NO _x	oxides of nitrogen
NLCD	National Land Cover Database
NPC	native plant communities
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
O ₃	ozone
OSA	Office of the State Archaeologist
OSHA	Occupational Safety and Health Administration
PEM1Ad	Palustrine Emergent, Persistent Temporarily Flooded Partly Drained/Ditched

PEM1Af	Palustrine Emergent, Persistent Temporarily Flooded Farmed
PEM1C	Palustrine Emergent, Persistent Seasonally Flooded
PEM1D	Palustrine Emergent, Persistent Continuously Saturated
PFO1A	Palustrine Forested, Persistent Temporarily Flooded
PSS1/EM1C	Palustrine Scrub-Shrub/Emergent, Persistent Seasonally Flooded
PSS1A	Palustrine Scrub Shrub Temporarily Flooded
PM _{2.5}	fine particulate matter equal to or less than 2.5 microns in diameter
PM ₁₀	particulate matter equal to or less than 10 microns in diameter
Project	Kimball Substation and new 115-kV Transmission Line Project
Project Area	The general area within an approximate 1-mile radius of the Project, unless otherwise defined
Proposed Alignment	The path that the transmission line will follow as proposed by Great River Energy
Proposed ROW	The 100-foot-wide area for construction and operation of the transmission line that is centered on the Proposed Alignment as proposed by the Applicants
Proposed Route	The corridor in which Great River Energy proposes to build the approximately 2.9-mile transmission line presented in this Route Permit Application. Great River Energy Requests a route width of 200 feet for most of the Proposed Route, with a wider route width of up to 750 feet at either end of the Project. The Proposed Route contains the Proposed ROW and the Proposed Alignment.
Proposed Route Width	An alternate term for the Proposed Route
PWI	Public Waters Inventory
ROI	region of influence
ROW	Right-of-way, or the area required for safe construction and operation of the transmission line. The Applicant's Proposed ROW is 100 feet.
SF ₆	sulfur hexafluoride
SHPO	State Historic Preservation Office
SO ₂	sulfur dioxide
SOBS	Sites of Biodiversity Significance
SSURGO	Soil Survey Geographic Database
Study Area	a 0.5-mile-wide buffer centered on the Proposed Alignment
subd.	subdivision
subp.	subpart
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Officer
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency

USFWS	U.S. Fish and Wildlife Service
VMP	Vegetation Management Plan
VOC	volatile organic compounds
WCA	Wetland Conservation Act
WMA	Wildlife Management Area

1. INTRODUCTION

Great River Energy and Meeker Energy (together, the Applicants) submit this Route Permit Application (Application) to the Minnesota Public Utilities Commission (Commission or MPUC) for a Route Permit to construct the proposed Kimball Substation and an approximately 4-mile 115-kilovolt (kV) single-circuit high voltage transmission line referred to as the Kimball Substation and 115-kV Transmission Line Project (Project). The Project is in Maine Prairie and Luxemburg Townships in Stearns County and Forest Prairie Township in Meeker County, Minnesota. An application completeness checklist is provided in **Appendix A**.

As shown on **Figure 1**, the Project will consist of new 115-kV overhead transmission line from Great River Energy's existing 115-kV Big Swan to Wakefield (ME-BW) transmission line to the proposed Kimball Substation, which will be constructed to receive 115-kV service. This Project is needed to enable Meeker Energy to continue to provide reliable service in the local community by interconnecting to Great River Energy's existing 115-kV transmission system. The proposed transmission line will be constructed, owned, and operated by Great River Energy. The proposed Kimball Substation will be constructed, owned, and operated by Meeker Energy.

1.1. Great River Energy and Meeker Energy Background

Great River Energy is a not-for-profit wholesale electric power cooperative which provides electricity to approximately 1.7 million people through its member-owner cooperatives and customers. Through its member-owners, Great River Energy serves two-thirds of Minnesota geographically and parts of Wisconsin (**Figure 1**). Great River Energy's electric system is interconnected directly with neighboring suppliers. Great River Energy is a member of the Midwest Reliability Organization and the Midcontinent Independent System Operator (MISO).

Great River Energy's mission is to safely provide member-owners with affordable, reliable energy in harmony with a sustainable environment. Great River Energy owns and operates more than 5,100 miles of transmission line (69-kV or higher) and owns more than 100 substations 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 and customer cooperatives.

Meeker Energy is a member-owned distribution cooperative serving Meeker, Kandiyohi, McLeod, Renville, Stearns, and Wright counties and is one of Great River Energy's transmission and energy customers (**Figure 2**). Meeker Energy is based in Litchfield, Minnesota, and provides electric service to over 10,000 residential accounts, businesses, and industries. Meeker Energy does not generate power; rather, Meeker Energy distributes energy to homes and businesses supplied and transmitted by Great River Energy and other wholesale providers to their substations. The Kimball Substation will provide power to customers in the local community, primarily in Stearns and Meeker counties.

Figure 1 Project Overview

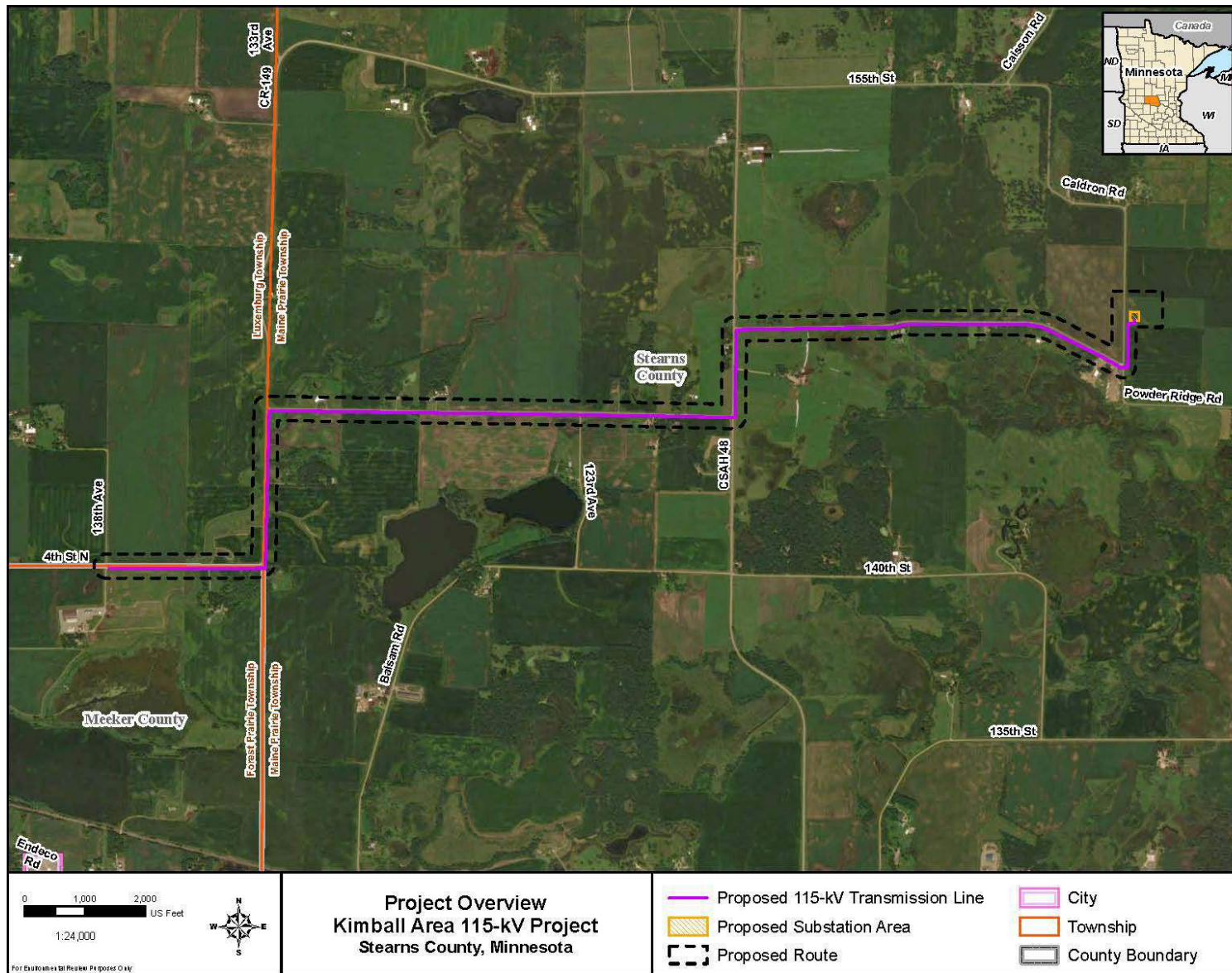


Figure 2 Great River Energy and Meeker Energy Service Territories



1.2. Project Ownership

Great River Energy will own and operate the new 4-mile 115-kV transmission line from a new switch structure on the ME-BW transmission line, to be located on the southeast corner of 140th Street (Meeker-Stearns Street) and 138th Avenue, to the proposed Kimball Substation. Great River Energy will own the last structure outside the substation fence line and the conductors going to the first structure located within the substation itself (i.e., the “high-side” structure). Great River Energy will also own some metering equipment within the proposed Kimball Substation.

Meeker Energy will own and operate the Kimball Substation. Meeker Energy will own the high-side structure and the conductor span between it and the 115/12.47-kV stepdown transformer. Beyond the transformer, the remainder of the substation will be comprised of low voltage equipment and control systems, which will also be owned by Meeker Energy.

1.3. Permittees and Project Contacts

Great River Energy and Meeker Energy are the permittees for the Project. The contacts for the Project and this Application are:

Mark Strohfus
Great River Energy
Project Manager, Transmission Permitting
12300 Elm Creek Blvd
Maple Grove, MN 55369
763-445-5210
MStrohfus@GREnergy.com

Dan Schrupp
Meeker Energy
Electric Operations Manager
1725 U.S. Highway 12 E, Suite 100
Litchfield, MN 55355
320-593-4126
dschrupp@meeker.coop

1.4. Project Location

The Project is located within Maine Prairie and Luxemburg Townships in Stearns County and Forest Prairie Township in Meeker County, Minnesota. The Project is north of, and between, the cities of Kimball and Watkins. The proposed Kimball Substation will be approximately 1.35 miles northwest of Kimball. The transmission line and substation do not cross city boundaries. Major highways in the area include State Highway 15 (north/south) and State Highway 55 (east/west) that intersect in Kimball. The Project is in the township, ranges, and sections shown in **Table 1**.

Table 1 Townships, Ranges, and Sections Crossed by the Proposed Route

County	Township Name	Township	Range	Sections
Stearns County	Luxemburg	122	30	36
	Maine Prairie	121	29	6
		122	29	31-33
Meeker County	Forest Prairie	121	30	1

1.5. Proposed Project

Great River Energy proposes to construct a new 4-mile 115-kV overhead single-circuit transmission line between its existing 115-kV ME-BW transmission line and the parcel where the proposed Kimball Substation will be located. Except for road crossings, the Project will be located entirely on private land. An overview of the Project is shown in **Figure 1. Appendix B** contains a series of detailed route maps depicting the Proposed Alignment, the 100-foot-wide right-of-way (ROW; Proposed ROW), and the 400-foot Proposed Route for the transmission line. At the easternmost end of the Project, the Proposed Route is expanded to 450 feet by 680 feet to accommodate the Kimball Substation. The Proposed Route contains the Proposed Alignment and Proposed ROW. More information on the Proposed Route, Proposed Alignment, and Proposed ROW are included in **Section 3.1.1**, **Section 3.1.2**, and **Section 3.1.3**, respectively.

What is a Proposed Route, Proposed Alignment, and Proposed Right-of-Way?

A “Proposed Route,” “Proposed Route Width,” or “Route” is a corridor that is requested by Great River Energy in this Application and approved by the Commission in a Route Permit. As part of the permitting process, the Commission may modify the Route. The Route will be defined by the Route Permit issued by the Commission and is the area in which Great River Energy will generally be authorized to construct its transmission line. Great River Energy is requesting a Route Width of 200 feet for most of the Route, with a wider area at the endpoints of the Project.

A “Proposed Alignment” is Great River Energy’s initial proposal for where the line would be built and where it turns or crosses from one side of a road to the other. The Proposed Alignment may change due to input from landowners, agencies, and owners of other utilities in the area.

A “Proposed Right-of-Way” or “Proposed ROW” is the space around the Proposed Alignment that Great River Energy would maintain and protect from encroachments to ensure the safe and reliable operation of the transmission line. Landowners are compensated for the ROW as part of the easement acquisition process. Great River Energy is proposing a Proposed ROW of 100 feet wide, or 50 feet on each side of the Proposed Alignment.

Great River Energy estimates that the transmission line will cost approximately \$5.5 million. Meeker Energy estimates that the Kimball Substation will cost approximately \$2.7 million. A more detailed breakdown of Project costs is included in **Section 3.4**.

Construction of the Kimball Substation and the transmission line is proposed to commence in third quarter 2028 and the Project is anticipated to be in service second quarter 2029.

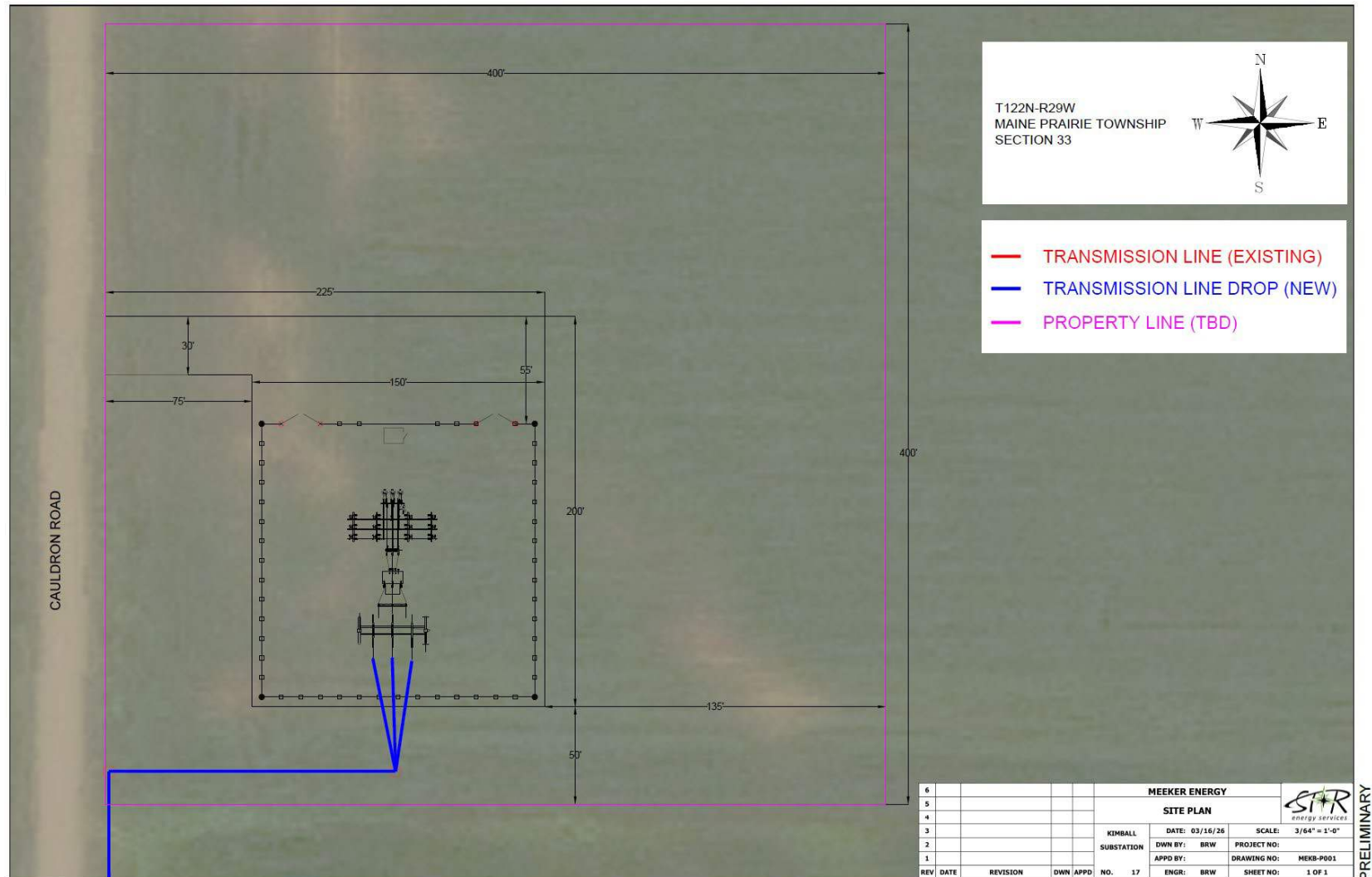
Great River Energy will construct the transmission line primarily with direct-embedded steel structures. Steel poles on concrete foundations might be needed for angles. These poles will typically be 70 to 90 feet above ground and placed 400 to 500 feet apart. A new switch will be installed on the existing ME-BW 115-kV line. More information on structure design is included in **Section 5.1.1**.

Great River Energy will generally obtain a 100-foot-wide easement for construction and operation of the transmission line, typically 50 feet off each side of the transmission line. Where the Project parallels road right-of-way, Great River Energy will typically place structures approximately 2 to 7 feet outside of the road right-of-way, to the extent that there are no other conditions necessitating other placement (e.g., buried utilities). Great River Energy will typically seek an approximately 55-foot-wide easement from landowners along roadways. Landowners will be compensated for the easement as part of the easement acquisition process.

Meeker Energy has existing overhead distribution lines along portions of the Proposed ROW. Great River Energy currently anticipates that distribution lines within the Proposed ROW will be buried by Meeker Energy. Because the distribution lines are not subject to Commission requirements due to their lower voltage, work related to those distribution lines is not included as part of this Application. More information on distribution lines is included in **Section 3.1.8**.

Meeker Energy will construct the Kimball Substation (see **Figure 3**). The substation fenceline will be approximately 140 feet by 140 feet (2,000 square feet). A graveled area of approximately 13,000 square feet will be constructed for vehicle access and parking, for a total disturbed area of approximately 33,000 square feet (0.75 acre). High voltage electrical components within the fenceline will include the high-side 115-kV structure (i.e., the last structure before the conductors interconnect to the substation equipment), a 115/12.47-kV stepdown transformer, a short segment of 115-kV conductor from the high-side structure, and switch gear.

Figure 3 Kimball Substation Preliminary Site Plan



1.6. Project Need and Purpose

The Project is needed to ensure reliable electric service in the Kimball area as businesses grow and new homes are constructed. The proposed Kimball Substation is strategically located to fill a gap in the local distribution system. By connecting the new substation and, as a result, the existing distribution system, to the existing 115-kV transmission system in this area, the Project will enable Meeker Energy to continue to provide highly reliable service to its member-consumers in the region.

An additional connection to 115-kV service has been discussed in some form for 15 years since the implementation of Meeker Energy's 2011-2025 Long Range Plan. The northern edge of the Meeker Energy service territory is subject to periods of the year where voltage drop can cause flickering lights. Over the years, various solutions have been successful in sustaining reliable service, but as load growth occurs in Maine Prairie and Southside Townships surrounding Kimball, many of these solutions are becoming ineffective during high loading periods.

Additionally, having another distribution resource in the area is important so that when there is scheduled maintenance or storm-related outages, the Kimball Substation can assist with back feeding neighboring Meeker Energy substations, which will allow continued power delivery.

As it does for any other high voltage transmission line, Great River Energy coordinated this Project through the Midcontinent Independent System Operator's (MISO) Transmission Expansion Planning (MTEP) process in accordance with MISO Business Practice Manual BPM 020. Great River Energy provided MISO with technical information about the Project, including the interconnection location, expected loading, facility characteristics, and anticipated in service timing. In addition, Great River Energy will provide updates to MISO as designs are refined. MISO evaluates projects using regional power flow and reliability models over a ten-year horizon, analyzing seasonal peak, shoulder, and light load conditions to assess system impacts, identify reliability needs, and determine any required system upgrades. Here, Great River Energy first submitted the Project with the identified end points to MISO in September 2022 and updates were provided on March 31, 2026.

1.7. Summary of Potential Human and Environmental Impacts

The Environmental Assessment (EA) included as **Chapter 6** of this Application analyzes the potential human and environmental impacts of the proposed Project. It also discusses ways to mitigate these impacts. Generally, potential impacts associated with the Project are anticipated to be temporary and minimal.

No homeowners will be displaced by the Project. All land impacted during construction will be restored to the extent practicable, and landowners will be compensated for any crop losses or damage due to construction operations or structure and conductor placement. The electric fields (EFs) associated with the new transmission line (i.e., 0.84 kilovolts per meter [kV/m]) will be significantly less than the maximum levels permitted by the Commission (i.e., 8 kV/m). No stray voltage issues are anticipated. Similarly, Project facilities will comply with applicable noise standards. The Proposed Route parallels existing roads for 100 percent of its length and electric distribution lines for 89 percent of its length. The routing of the Project minimizes potential tree

removal; there are approximately 2.89 acres of trees within the Proposed ROW. These and other potential human and environmental impacts, as well as applicable avoidance and minimization measures, are described in more detail in **Chapter 6** of this Application. A list of unavoidable impacts related to construction and operation of the Project is presented in **Section 6.9**.

Great River Energy will develop its final transmission line alignment within the Route permitted by the Commission based on information developed in the record, as well as coordination with landowners and applicable federal, state, and local agencies to further avoid and minimize impacts on human and environmental resources, and in compliance with federal, state, and local regulations.

1.8. Preapplication Coordination and Public Involvement

1.8.1. Public Involvement

Great River Energy has conducted ongoing outreach with the landowners whose property is crossed or touched by the proposed route width since October 2025. An Open House meeting was held at the Maine Prairie Town Hall on March 18, 2026. Approximately 22 people signed into the Open House. Invitations were mailed to 49 landowners whose property is crossed or touched by the Project, as well as an alternate route (see **Chapter 4**). Invitations were also mailed to local government officials and agencies. A notice was also published in the Tri-County News newspaper on March 12, 2026. Copies of the invitation, mailing list and newspaper notices are included in **Appendix C**.

At the Open House, landowners asked questions about tree clearing, easement negotiations, electric and magnetic fields (EMF), stray voltage, and what would happen with the existing distribution lines. Several people discussed the Minnesota Energy Connection project, a 345-kV transmission line proposed to be built in the area, and they expressed concern that the proposed Kimball Substation and 115-kV tap line was being installed to serve others than the local community.

Upon submission of this Route Permit Application, the Commission's permit review process provides opportunities for the public to participate and comment on the Project in accordance with Minnesota laws and regulations. More information on participating and commenting on Commission proceedings can be found on its website, <https://mn.gov/puc/get-involved/public-comments/>. The docket number for the Project is 26-182. **Section 2.3** includes more information on the review process.

1.8.2. Preapplication Coordination

Minn. Stat. § 216I.05 requires applicants to provide notice to each local unit of government within the Route, Minnesota Tribal governments, and state technical resource agencies. The Applicants have conducted outreach as presented below. The Applicants have incorporated information received during agency consultations into the relevant sections of this Application. Where additional coordination has occurred, it is summarized below with references to the section of this Application which provides additional detail.

On April 23, 2026, Great River Energy sent initial notification letters to federal, state, and local agencies regarding the Project. These letters stated that Applicants intended to file a Route Permit Application for the Project, requested comment, and offered to meet about the Project. The draft letter template, correspondence sent and received to date, and a table presenting outreach efforts are included in **Appendix D**. Agency responses, where received, are summarized below.

1.8.2.1. Federal Agencies

U.S. Army Corps of Engineers (USACE; no response to date)

U.S. Fish and Wildlife Service (USFWS)

- On March 23, 2026, the Applicants obtained an Official Species List through the USFWS Information for Planning and Consultation (IPaC) online tool.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS; no response to date)

1.8.2.2. Minnesota Agencies

- Minnesota Department of Agriculture (MDA)
 - Steve Roos responded on May 28, 2026, acknowledging receipt of the Project notification letter and offering support if necessary when preparing the Agricultural Impact Mitigation Plan (AIMP). Steve Roos also provided comments on a draft Agricultural Impact Mitigation Plan on September 4, 2026.
- Minnesota Department of Health (MDH; no response to date)
- Minnesota Department of Natural Resources (MDNR)
 - On April 17, 2026, the Applicants received the Natural Heritage Review document from the MDNR.
- Minnesota Department of Transportation (MnDOT)
 - Tom Cruikshank and Stacy Kotch Egstad responded to the Project notification letter on April 27 and April 28, 2026, respectively. Each confirmed that the Project will not impact MnDOT right-of-way but requested to be informed should alternative routes be considered.
- Minnesota Indian Affairs Council (MIAC; no response to date)
- Office of the State Archaeologist (OSA; no response to date)
- Minnesota Pollution Control Agency (MPCA; no response to date)

- Minnesota State Historic Preservation Office (SHPO)
 - The Applicants submitted the Phase 1A Cultural Resources Assessment on May 29, 2026. SHPO indicated this assessment was accurate in its June 22, 2026, response.
- Wetland Conservation Act (WCA) – Board of Water and Soil Resources (BWSR; no response to date)
- Minnesota Office of Pipeline Safety (no response to date)
- Minnesota Department of Commerce
 - Chase Christopherson responded on April 23, 2026, to the Project notification letter inquiring which Tribal governments had been notified of the Project. The Applicant responded with information that the 11 federally-recognized Tribes in Minnesota were sent notification letters.
- Minnesota Department of Revenue (no response to date)
- Minnesota Department of Labor and Industry (no response to date)
- Minnesota State Legislature
 - Senator Jeff Howe was sent Project information via the communication form on his website on April 23, 2026. A staff member reached out to the Applicants via email on April 29, 2026 requesting the Project notification letter. The letter was emailed to Senator Howe’s office.
- Minnesota Public Utilities Commission
 - The Applicants contacted Ray Kirsch with the Commission to coordinate an introductory Project call. This meeting occurred on May 18, 2026.

1.8.2.3. Local Agencies and Organizations

- Meeker County Soil and Water Conservation District (no response to date)
- Meeker County (no response to date)
- Stearns County Conservation District (no response to date)
- Stearns County
 - Chris Byrd with the Stearns County Highway Department responded to the Project notification letter on April 23, 2026, requesting a pre-application coordination meeting. This meeting occurred on June 18, 2026.

- Stearns County Commission
 - Stearns County Commissioner Jeff Bertram responded to the Project notification letter on April 24, 2026. He expressed concerns with having multiple projects in the area and the frustration his constituents feel. Mark Strohfus, project manager at Great River Energy, followed up with a phone call to Commissioner Bertram on April 24, 2026, and an additional follow up email on April 29, 2026.
- Stearns County WCA (no response to date)
- Forest Prairie Township (no response to date)
- Luxemburg Township (no response to date)
- Maine Prairie Township (no response to date)

1.8.2.4. Tribal Nations and Organizations

On April 20, 2026, a representative of Great River Energy made a phone call to Tribal Historic Preservation Officers (THPOs).

On April 23, 2026, Great River Energy sent notification letters to those individuals on the MPUC's Tribal Government service list and THPO service list. These letters stated that Great River Energy intended to file a Route Permit Application for the Project, requested comment, and offered to meet about the Project.

On May 14, 2026, Great River Energy sent follow-up notification email to the THPOs of Tribes that did not respond to the April 2026 letter.

Tribal government responses, where received, are summarized below. A sample letter, correspondence sent and received to date, and a table presenting outreach efforts are included in **Appendix E**.

- 1854 Treaty Authority (no response to date)
- Bois Forte Band of Chippewa (no response to date)
- Fond du Lac Band of Lake Superior Chippewa (no response to date)
- Grand Portage Band of Lake Superior Chippewa (no response to date)
- Leech Lake Band of Ojibwe
 - The Leech Lake Band of Ojibwe provided a determination on May 20, 2026, that there are no recorded historic properties within the Project Area. The correspondence also requested that all work should stop if any human remains or suspected human remains are found.

- Lower Sioux Indian Community (no response to date)
- Mille Lacs Band of Ojibwe
 - On April 27, 2026, Kelly Applegate, Commissioner of Natural Resources with the Mille Lacs Band of Ojibwe responded to the Project notification letter by acknowledging receipt of the email and indicating that the Mille Lacs Band of Ojibwe will review the Project.
- Prairie Island Indian Community (no response to date)
- Red Lake Nation (no response to date)
- Shakopee Mdewakanton Sioux Community
 - Leonard Wabasha, THPO for the Shakopee Mdewakanton Sioux Community, responded to the Project notification on April 23, 2026, indicating the Tribe has no concerns regarding the proposed route and encouraged the Applicants to consult with Tribal THPOs closer to the Project area.
- Upper Sioux Community, Minnesota (no response to date)
- White Earth Band of Minnesota Chippewa (no response to date)

2. REGULATORY PROCESS

2.1. Certificate of Need Not Required

Minnesota Statutes Section (Minn. Stat. §) 216B.243, subdivision (subd.) 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...” Large energy facility is defined as “any high-voltage transmission line with a capacity of 100 kilovolts or more with more than ten miles of its length in Minnesota.”¹ Because the Project is less than 10 miles in length, a Certificate of Need is not required.

2.2. Route Permit

Minn. Stat. § 216I.05, subd. 2, provides that “[a] person is prohibited from constructing a high-voltage transmission line without a Route Permit issued by the commission.” High-voltage transmission line (HVTL) is defined by Minn. Stat. § 216I.02, subd. 8, as “a conductor of electric energy and associated facilities that is (1) designed for and capable of operation at a nominal voltage of 100 kilovolts or more, and (2) is greater than 1,500 feet in length.” Because the Project consists of a 115-kV transmission line that is 4 miles long, which is greater than 1,500 feet in length, a Route Permit from the Commission is required.

2.3. Standard Review Process

Minn. Stat. § 216I.07 provides a Standard Review Process for transmission lines between 100- and 300-kV; the Project is proposed as 115-kV and thus qualifies for the Standard Review Process. An Environmental Impact Statement is not required under the Standard Review Process. Instead, an EA is incorporated into this Application as required by Minn. Stat. § 216I.07, subd. 3.

2.3.1. Application Preparation

Minn. Stat. § 216I.05, subds. 3 and 4, set forth the information that must be included in an Application. Under the Standard Review Process, an applicant is not required to propose alternative routes but must discuss other routes that were considered and rejected by the applicant (Minn. Stat. § 216I.05, subd. 3). An alternative route considered and rejected for the Project is discussed in **Chapter 4**.

As required by Minn. Stat. § 216I.07, subd. 3, the Applicants prepared an EA, which is incorporated into this Application as **Chapter 6**. The EA contains “information regarding the proposed project's human and environmental impacts, and (2) address[es] mitigating measures for identified impacts. The environmental assessment is the only state environmental review document that must be prepared for the proposed project” (Minn. Stat. § 216I.07, subd. 3).

2.3.2. Preapplication Coordination

Minn. Stat. § 216I.05, subd. 5 requires that an applicant provide notice to each local unit of government within which a route is proposed; Minnesota Tribal governments; and state technical

¹ Minn. Stat. § 216B.2421, subd. 2(3) (2024).

resource agencies. Preapplication coordination was discussed in **Section 1.8.2** and records of this coordination are provided in **Appendix D** and **Appendix E**.

Minn. Stat. § 216I.05, subd. 6, requires that an applicant must provide a draft application to Commission staff for review. The Applicants provided a draft of this Application to the Commission on June 22, 2026. The Commission’s review focused on the Application’s completeness and provided clarifications that might help the Commission’s review of the Application. An application completeness checklist is provided in **Appendix A**; the Commission’s Draft Application Review Comments letter, and the Applicants’ response, are provided in **Appendix F**.

2.3.3. Application Notice

After an Application is filed, the Commission determines whether the Application is complete within 10 working days (Minn. Stat. § 216I.05, subd. 7). Upon the Commission’s acceptance of this Application as complete, the Commission will provide notice in accordance with Minn. Stat. § 216I.05, subd. 8. This includes newspaper notice, notice to local governments and Tribes, and notices to landowners. To facilitate this notice, the relevant contacts at federal, state, and regional and local government units, Tribal governments and organizations, along with a list of names of each owner whose property is within or adjacent to the Proposed Route, is included in **Appendix D**, **Appendix E** and **Appendix G**.

In addition, a paper version of the application will be available for public review at the Great River Regional Library – Kimball; 51 Spruce Avenue West; Kimball, Minnesota 55353. An electronic version of the Application will be available on eDockets in docket number 26-182.

2.3.4. Public Information & Scoping Meeting

The Standard Review Process requires the Commission to schedule at least one public information and scoping meeting near the Project location. The Applicants and the Commission will have representatives available at the public meeting(s). The purpose of the meeting is to provide information about the Project and permitting process, present key issues, answer questions, and to allow stakeholders to propose alternate routes for consideration. Additionally, the Commission will gather information concerning the necessity of an EA addendum under Minn. Stat. § 216I.07, subd. 3.

2.3.5. Draft Route Permit

Once the public information and scoping meeting has been held and after the public comment period closes, the Commission will prepare a draft Route Permit for the Project. The draft Route Permit will “identify the person or persons who are the permittee, describe the proposed project, and include proposed permit conditions” (Minn. Stat. § 216I.05, subd. 10). The Commission can change the draft Route Permit in any respect before final issuance or may deny the Route Permit (Minn. Stat. § 216I.05, subd. 10). Receiving a draft Route Permit does not mean the Applicants can construct the Project.

2.3.6. EA Addendum

Minn. Stat. § 216I.07, subd. 3 (b), states that “if after the public meeting the [C]ommission identifies other . . . routes or potential impacts for review, the [C]ommission must prepare an addendum to the [EA] that evaluates (1) the human and environmental impacts of the alternative . . . route, and (2) any additional mitigating measures related to the identified impacts consistent with the scoping decision.” Should an EA addendum be necessary, the Commission will issue a scoping decision that identifies the topics to be studied in the addendum (Minn. Stat. § 216I.05, subd. 10(2)) and Commission staff will prepare it.

2.3.7. Public Hearing

After the Commission issues a draft Route Permit and, if necessary, an EA addendum, a public hearing and associated comment period will be held to again solicit public input and to create an administrative record. The Commission will select a person to preside over the hearing, which, in practice, is usually an administrative law judge (ALJ) from the Court of Administrative Hearings. The Commission will establish the procedures to be followed at and following the hearing. The Applicants will be present at the hearing as well as Commission staff. The Applicants and Commission staff will be available to answer questions. See Minn. Stat. § 216I.07, subd. 4.

Once the public hearing is concluded, if the Commission has so requested, 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 decide as to the route for the Project, using the criteria set forth in Minn. Stat. 216I.05, subd. 11.

2.3.8 Timing

A Route Permit under the Standard Review Process must be issued 6 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(s). See Minn. Stat. § 216I.07, subd. 4. The permitting timeline for the Standard Review Process is shorter than the timeline required for the Major Review Process provided in Minn. Stat. § 216I.06.

2.4. 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 route that is permitted by the Commission and the conditions encountered during construction. A list of the federal, state, and local permits that could be required for the Project is provided in **Table 2**. Each of these requirements and their applicability to the Project are discussed below and in the relevant section of the Application. **Appendix D** contains a record of correspondence with regulatory agencies to date.

Table 2 Summary of Permits, Licenses, Approvals, and Consultations

Permit	Jurisdiction	Anticipated
Federal		
Section 404 Clean Water Act Permit (Utility Regional General Permit)	U.S. Army Corps of Engineers	Yes
Section 10 Rivers and Harbors Act	U.S. Army Corps of Engineers	No
Endangered Species Act / Migratory Bird Treaty Act Consultation	U.S. Fish and Wildlife Service	Yes
Part 7460 Airport Obstruction Evaluation	Federal Aviation Administration	No
State		
Route Permit	Public Utilities Commission	Yes
State Endangered Species Consultation	Department of Natural Resources	Yes
Utility Crossing License	Department of Natural Resources	No
Water Appropriation General Permit – Temporary Construction Dewatering	Department of Natural Resources	Unlikely
National Historic Preservation Act Consultation Minnesota Field Archaeology Act Minnesota Historic Sites Act Minnesota Private Cemeteries Act	State Historic Preservation Office Tribal Historic Preservation Officers	Yes
National Pollutant Discharge Elimination System Construction Stormwater General Permit	Pollution Control Agency	Unlikely
Section 401 Clean Water Act Water Quality Certification (via the Section 404 Clean Water Act Permit – Utility Regional General Permit)	Pollution Control Agency	Yes
Wetland Conservation Act	Board of Water and Soil Resources – Local Government Unit Coordination	Yes
Miscellaneous Work Permit for Trunk Highways	Department of Transportation	No
Oversize and/or Overweight Permit	Department of Transportation	Possible
Utility Permit	Department of Transportation	No
Local		
Oversize/Overweight Moving Permit	Meeker and Stearns counties	Possible
Utility Permit	Meeker and Stearns counties	Possible
Approach Application	Meeker and Stearns counties	Possible
Right-of-Way Permit	Meeker and Stearns counties	Possible
Local Road Permit	Townships	Possible
Other		
Crossing Permits/Agreements	Utilities	Possible

2.4.1. Federal Approvals

2.4.1.1. Section 404 Permit Clean Water Act Permit

A Section 404 permit is required from the USACE, St. Paul District, if there are discharges of dredged or fill material into waters of the United States, as defined by the Clean Water Act. Currently, Great River Energy does not anticipate the transmission line will impact waters of the United States. If wetlands are impacted by the final alignment, impacts are anticipated to be eligible for coverage under the Minnesota Utility Regional General Permit. Should this occur, 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 6.8.8** discusses the potential impacts to wetlands associated with the Proposed Route.

2.4.1.2. U.S. Fish and Wildlife Service Endangered Species Act, Bald and Golden Eagle Protection Act, and Migratory Bird Treaty Act

In accordance with the Endangered Species Act (ESA), the Applicants will assess whether activities associated with construction and operation of the Project could affect any federally listed threatened, endangered, or proposed threatened and endangered species, designated critical habitat, or proposed critical habitat. The Applicants have conducted an early review of the Project using USFWS tools (see **Appendix D**) and will again review these tools for changes once a route has been selected and design of the transmission line is complete. **Section 6.8.5** discusses potential impacts to federally listed threatened and endangered species associated with the Proposed Route.

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (BGEPA). The Migratory Bird Treaty Act (MBTA) 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 will require marking transmission line shield wires or to use alternate structures to reduce the likelihood of avian collisions once the design of the transmission line is complete.

2.4.1.3. 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). **Section 6.4.7** discusses potential impacts to airports.

2.4.2. State of Minnesota Approvals

2.4.2.1. State Endangered Species and Sensitive Resource Consultation

Minn. Stat § 84.0895 prohibits the take, import, transport, or selling of any portion of an endangered species or wild animal or plant. To determine if the Project will impact a state listed threatened or endangered species, Great River Energy has consulted with the MDNR Natural Heritage and Nongame Research Program, which collects, manages, and interprets information about nongame species, through the MCE system. The MCE also provides information on other sensitive resources in the Project vicinity. The response to Great River Energy's MCE review request is included in **Appendix D**. As reviews under the MCE system are valid for 1 year from

submittal, the Applicants will conduct an updated MCE review once a route has been selected, and within one year prior to construction of the Project.

Great River Energy also provided a separate notification letter to MDNR as part of its April 2026 outreach. No response to this letter has been received to date (see record of outreach in **Appendix D**). Great River Energy will work with the MDNR to identify any areas that will require marking transmission line shield wires or use of alternate structures to reduce the likelihood of avian collisions once the transmission line design process is complete.

2.4.2.2. Historic, Archaeological, and Tribal Cultural Resources

The Applicants have assessed whether the Project might have the potential to cause effects to a 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 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 SHPO, and the 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 all human burials, human remains, or human burial grounds, including precontact American Indian burial mounds, found on or in all public or private lands and waters in Minnesota.

Great River Energy submitted a literature review of archaeological and historic properties in the Project vicinity to the Minnesota SHPO in a letter dated June 24, 2025; SHPO responded on June 22, 2026. (see **Appendix D**). Further, Great River Energy requested feedback on the Project from the 11 federally recognized Minnesota Tribal Governments identified in Minn. Stat. §10.65, subd. 2. Further details regarding outreach are provided in **Section 6.7**, and correspondence is provided in **Appendix E**.

2.4.2.3. 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 in **Section 6.8.9**.

2.4.2.4. National Pollutant Discharge Elimination System Construction Stormwater General Permit

Coverage under the MPCA National Pollutant Discharge Elimination System Construction Stormwater General Permit is required for stormwater discharges associated with construction

activities disturbing one or more acres. One requirement of permit coverage is to develop and implement a Stormwater Pollution Prevention Plan (SWPPP), which includes best management practices (BMPs) to minimize discharge of pollutants from the construction site. Great River Energy and Meeker Energy expect that coverage under this permit will not be required for the transmission line and Kimball Substation, as construction will not disturb more than 1 acre of soil.

2.4.2.5. Section 401 Water Quality Certification

A Section 401 water quality 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 state water quality standards set under the Clean Water Act in waters of the U.S. The federal agency 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 waives its review of the project. As discussed above, should Section 404 coverage be required, the Project is likely to qualify for coverage under the Minnesota Utility Regional General Permit; the MPCA has already issued a Section 401 Certification associated with this permit and no additional review or permit will be required should the Project meet applicable conditions.

2.4.2.6. Wetland Conservation Act

BWSR coordinates the state's Wetland Conservation Act (WCA). Stearns and Meeker counties administer the WCA within their boundaries; however, it is anticipated that Stearns County will likely be the lead agency reviewing the entirety of the Proposed Route, as needed. Should wetlands be impacted along the permitted alignment, Great River Energy anticipates being eligible for the Exemption for Utilities in accordance with Minn. Stat. § 103G.2241, subd. 6, and Minnesota Rules (Minn. R.) 8420.0420, subp. 6, which allow utility exemptions for installation, maintenance, repair, or replacement of transmission 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 0.5 acre of wetlands. Alternatively, the transmission line may also qualify for a federal approvals exemption for utilities under Minn. R. 8420.0420, subp. 4, which waives the requirement for a replacement plan for impacts authorized under Section 404 of the Clean Water Act if minimum state standards are met.

Further discussion on potential impacts to wetlands associated with the Proposed Route are provided in **Section 6.8.8**.

2.4.2.7. Utility Accommodation Permit

A Utility Accommodation Permit is required by MnDOT for the use and occupancy of highway right-of-way by public and private utility facilities. The Project will not impact any state highways or rights-of-way.

2.4.2.8. Miscellaneous Work Permit for Trunk Highways

A Miscellaneous Work Permit is required by MnDOT for placement of temporary obstructions on the highway right-of-way (e.g., survey vehicles) and vegetation removal. The Project will not impact any state highways or rights-of-way.

2.4.2.9. Oversize/Overweight

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

2.4.3. Local Approvals

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

2.4.3.1. County Road Permits

The Project crosses county road right-of-way. The Kimball Substation will require access off Caldron Road. Therefore, right-of-way Permits, Utility Permits, and Approach Applications might be necessary. An Oversize/Overweight Moving Permit is required for moving oversized structures longer than 65 feet on county roads in Stearns County. The transportation contractor will apply for this permit once the transmission line design is complete and will acquire it prior to applicable construction activities. Applicable approvals related to township roads will be obtained and complied with, if applicable.

3. PROPOSED PROJECT

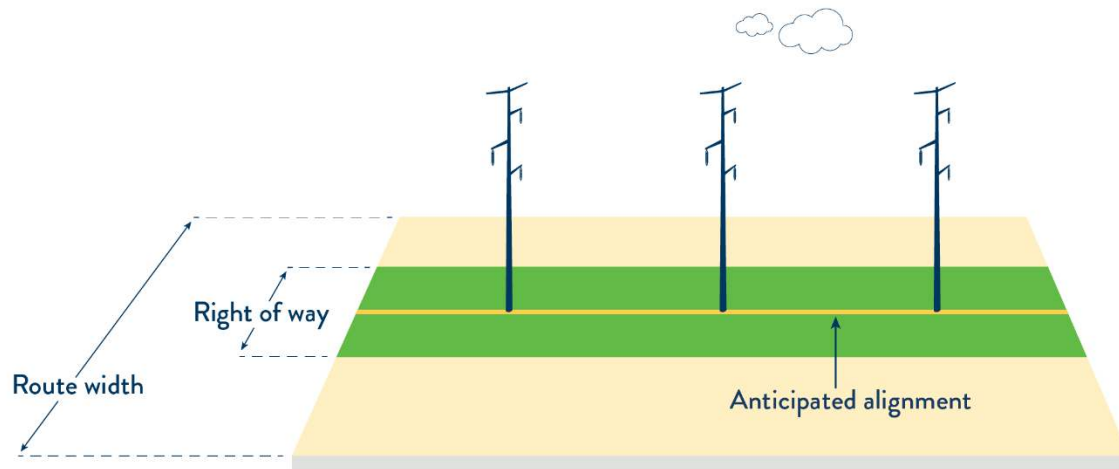
Great River Energy proposes to build a new 4-mile, 115-kV single-circuit transmission line between its existing 115-kV ME-BW transmission line and the proposed Kimball Substation in Stearns County, Minnesota. This Project is needed to enable Meeker Energy to continue to provide reliable service in the region by connecting the existing distribution system to the 115-kV transmission system through the Kimball Substation.

An overview of the Project is shown on **Figure 1**. The Kimball Substation is shown on **Figure 3**. **Appendix B** contains a series of larger scale aerial photo maps depicting the Proposed Route (the corridor within which the Project will be located), Proposed Alignment, and the 100-foot-wide Proposed ROW for construction and operation of the Project.

3.1. Transmission Line

When the Commission issues a Route Permit, it designates a transmission line route (or, Route Width). This may be different than the route that an applicant proposes in its Application. If the permittee wishes to construct the transmission line outside of the route designated in the permit, it must request to amend the permit. The permit also identifies an anticipated alignment and right-of-way within the route (**Figure 4**).

Figure 4 Arrangement of the Route Width, Right-of-Way, and Alignment



3.1.1. Proposed Route

Minn. Stat. §216I.02, subd. 15, defines a “route” as the location of a HVTL between two end points. Under this definition, a route may have a variable width of up to 1.25 miles. Commission Route Permits define the route (or, route width) for each project. The route width is typically wider than the ROW needed to construct and operate a project to provide flexibility to address human and environmental concerns, landowner concerns, and physical constraints (e.g., other utilities)

that arise during the permitting process and after a Route Permit has been issued but is not so wide that it is impossible to determine where the transmission line would be constructed. This makes predicting potential impacts possible. The route, in combination with the anticipated alignment, is intended to balance flexibility and predictability in the Commission's Route Permit.

Within this Application, Great River Energy is generally requesting a 400-foot-wide Proposed Route centered on existing road centerlines; Great River Energy is also requesting a wider width of approximately 450 feet by 680 feet where the Kimball Substation will be constructed east of Caldron Road (see **Appendix B**).

3.1.2. Proposed Alignment

As described in **Section 1.5**, the Proposed Alignment refers to the location of the poles and conductors within the Proposed ROW as proposed by the Applicant. It is not the final alignment. The Proposed Alignment is used for review purposes only – the transmission line might ultimately be constructed elsewhere within the permitted route width.

As part of this permitting process, the Commission will authorize a route for the Project that identifies a route width and anticipated alignment. The anticipated alignment approved by the Commission may differ from the Proposed Alignment based on input received from landowners, agencies, and other stakeholders during the permitting process. The transmission line must be constructed generally along the anticipated alignment unless modified in accordance with the Route Permit. Modifications can be necessary because of feedback from landowners, design or engineering constraints, and unforeseen conditions.

The Proposed Alignment begins at Great River Energy's existing ME-BW 115-kV transmission line at the intersection of 138th Avenue and 140th Street. The Proposed Alignment continues east and turns north along County Road 149 then east on 145th Street. At County Road 48 the Proposed Alignment turns north again for a short distance before turning east to follow Balkan Road. The Proposed Alignment turns north at Caldron Road and follows it to the substation location.

The Project will be collocated with existing road right-of-way for its entire length, except where it will turn into the Kimball Substation. Further discussion of collocation with road right-of-way is provided in **Section 6.4.7**. Ultimately, Great River Energy plans to place the Proposed Alignment approximately 2 to 7 feet outside of existing road right-of-way.

3.1.3. Proposed Right-of-Way

The ROW is the area required for safe operation of the transmission line. The Proposed ROW is the Applicant's proposal for the physical land area that will be maintained by Great River Energy to construct, operate, and maintain the transmission line. The Proposed ROW is within the Proposed Route Width. The final ROW for the Project must be within the route approved by the Commission and is the area from which the permittee may obtain agreement from landowners (typically in the form of an easement) to construct and operate the transmission line.

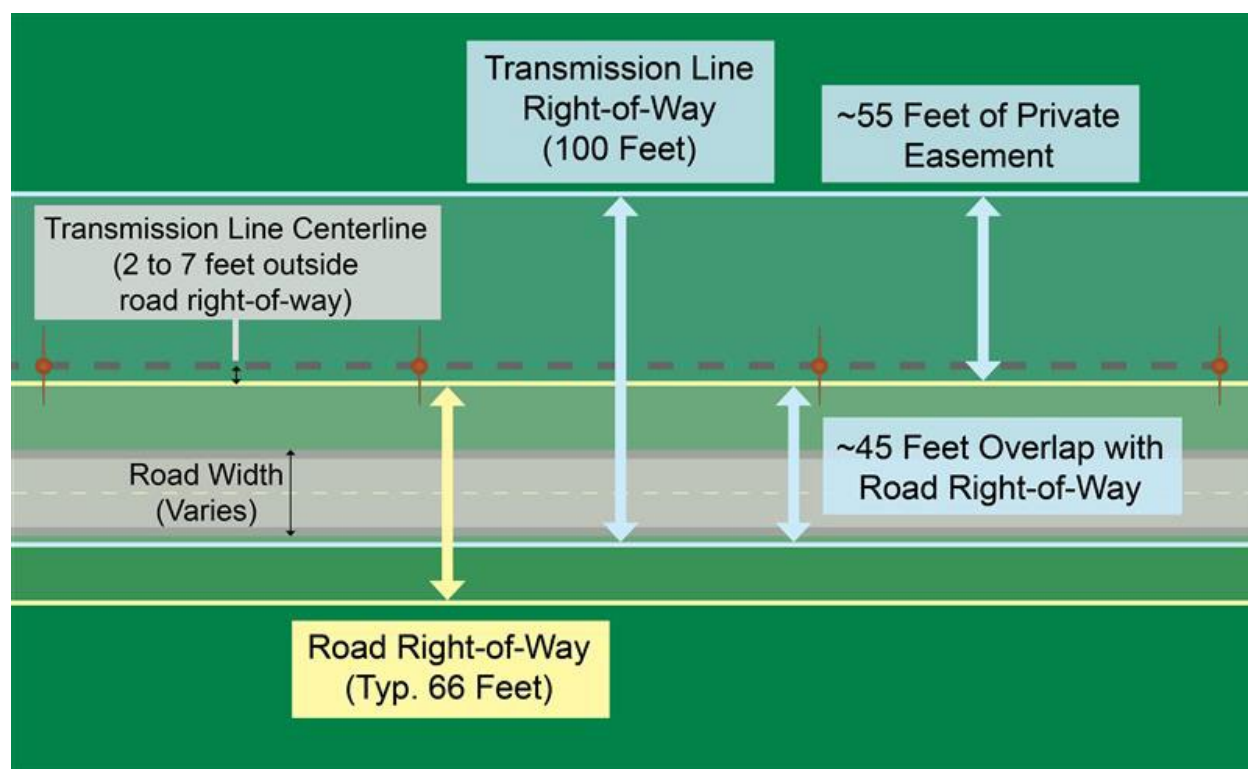
Great River Energy will require a new 100-foot-wide easement for construction and maintenance of the transmission line. Great River Energy representatives will work directly with individual landowners to acquire the necessary easements and other land rights for the construction,

operation, and maintenance of the Project once the final route and alignment are determined (see **Section 5.1.3**).

Where the Project parallels road right-of-way, Great River Energy plans to place poles approximately 2 to 7 feet outside of the road right-of-way, to the extent that there are no other conditions necessitating other placement (e.g., other buried utilities). Great River Energy will typically seek an approximately 55-foot-wide easement from landowners along roadways. In this example, the remaining 45 feet will be shared with road right-of-way. This general arrangement is depicted on **Figure 5**.

Survey and title work completed after issuance of a Route Permit ultimately define the size (i.e., width) and location of existing road right-of-way, the necessary placement of transmission line poles outside of the road right-of-way, the areas of overlap, and the easement that must be obtained from the private landowner. The aerial maps in **Appendix B** show where the Project parallels existing roads and road right-of-way, with the name of the road labeled for clarity. Additional description is provided in **Section 6.4.7**.

Figure 5 Arrangement of Road Right-of-Way Relative to Transmission Line Easement



3.1.4. Temporary Easements

The Applicants may acquire additional temporary land use rights for equipment laydown and transmission line stringing areas. Location, use, restoration, and landowner compensation for these areas will be negotiated with respective landowners through a temporary lease or easement. The locations of temporary easements are not typically specified in Commission route permits.

3.1.5. Transmission Line

A new three-way switch structure will be constructed at the ME-BW transmission line. Access to the switch structure is anticipated to occur from 138th Avenue or 140th Street. The Project will primarily use direct-buried steel structures. Larger steel poles on concrete foundations may be needed for angles. Typical pole heights will range from 70 to 90 feet above ground and the distance or “span” between poles will generally range from 400 to 500 feet. Final design, which will occur after the Commission issues a Route Permit, will determine the final span distances, as well as the need for specialty poles (e.g., steel poles on foundations). Photos of potential Project structures are shown in **Section 5.1.1**.

3.1.6. Transmission Line Clearance Requirements

National Electrical Safety Code (NESC) sets minimum clearance requirements between conductors and structures. NESC clearance requirements are summarized in **Table 3**. For a 115-kV transmission line such as the Project, the NESC minimum clearance is 8.6 feet under a 48-miles per hour (mph) wind. When there is no wind, the conductors must have a clearance of 9.1 to 11.6 feet from some common structures. The amount of blowout is dependent on several factors, including the span length and conductor type. On a typical 115-kV transmission line with a 500-foot span, blowout is approximately 10 feet with 48 mph winds and approximately 16 feet with 98 mph winds. As such, the ROW is protective of the 98-mph wind case² and includes approximately 20 feet of additional clearance. The final line design evaluates blowout and clearances based on actual span distances, the type of conductor being used, and the actual structure types outside of the ROW.

Table 3 NESC Clearance Requirements for 115-kV Transmission

Risk Case	Minimum Clearance with No Wind (feet)	Estimated Blowout with 48 mph Wind (feet)	Estimated Blowout with 98 mph Wind (feet)
From a lighting support, traffic signal support, or support structure for another line.	9.1	10	16
From any other buildings, walls, projections, structures, bridges, etc.	11.6	8.6	16

3.1.7. Outages

At times, outages are necessary to construct a transmission line. 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 transmission grid reliability

² Adding the 98-mph hour wind case of 16 feet with the minimum no wind clearance of 11.6 feet requires a ROW clearance of 27.6 feet. The 50-foot ROW proposed by Great River Energy provides for an additional 22.4 feet of clearance on either side of the alignment. This distance is approximately half of the ROW proposed on either side of the alignment.

requirements. Coordination is accomplished through well-defined outage scheduling procedures that use web-based tools, allow for study affirmation and ultimate approval of the submitted outage. Once approved, detailed switching orders are developed and shared with all parties involved using well-defined processes to ensure the 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 Meeker Energy.

3.1.8. Distribution Lines

Great River Energy does not own, operate, or install low voltage distribution lines. Great River Energy sometimes allows distribution utilities such as Meeker Energy to attach distribution lines to its high voltage transmission line structures, below the high voltage lines. This is commonly called “underbuild” or “underbuilt.” A depiction of distribution underbuild is included on **Figure 6**, below. Note that the Project may have “single-phase distribution underbuild” which results in two or four distribution conductors underneath the transmission conductors as depicted on **Figure 6**.

Alternatively, Great River Energy may request that the distribution lines be buried. Great River Energy anticipates that distribution lines currently within the Proposed ROW will be buried by Meeker Energy. Changes to electric distribution lines under 100-kV do not require a permit from the Commission.

3.1.9. Reliability

An average 115-kV transmission line is expected to be available approximately 99.9 percent of the year. Great River Energy expects that this transmission line should not be out of service for any extended period, other than the rare times when scheduled maintenance is required or when an event, such as a tornado, thunderstorm, ice storm, or a vehicle or heavy equipment collides with a structure causes an outage.

3.1.10. Service Life

The service life of a transmission line and substation is approximately 40 years, although based on experience, it is quite possible that the service life of these facilities will exceed 40 years.

3.1.11. Design Considerations to Accommodate Future Needs

Minn. Stat. §216I.05, subd. 11 (b)(10) requires the Commission to consider future needs for large energy infrastructure facilities in the Project area. The Project is designed to serve increased electrical demand into the future and help to ensure electric reliability. The Project is not designed for future expansion. Sometimes, for example, structures are designed for the addition of a second circuit or a substation footprint is expanded to accommodate an additional transformer. For this Project, the Applicants anticipate that a single-circuit design is sufficient to meet the area’s energy needs for the next 10 to 15 years. The Applicants are not currently aware of any large loads being developed in the Project Area, defined as the general area within an approximate 1-mile radius of the Project.

Figure 6 Photos of 115-kV Structures with 3-Phase Distribution Underbuild



3.2. Substation

Substations are a part of the electric generation, transmission, and distribution system and contain high-voltage electric equipment to monitor, regulate, and distribute electricity safely and reliably. The Kimball Substation will convert the 115-kV electric energy carried by the transmission line to 12.47-kV for use on Meeker Energy's distribution system.

3.2.1. Substation Site and Design Considerations

Meeker Energy intends to locate the Kimball Substation east of Caldron Road (**Figure 1**) where the landowner has agreed to sell the land for construction of the substation. The substation location was selected because of growing residential and commercial growth in the Kimball area, its close proximity to an existing 115-kV transmission line, and because it fills a geographic gap in its distribution system.

The substation fenceline will be approximately 140 feet by 140 feet (20,000 square feet or approximately 0.45 acre) with a 6-foot-tall fence topped with three strands of barbed wire. A graveled area of approximately 13,000 square feet will be constructed for vehicle access and parking, for a total disturbed area of approximately 33,000 square feet (0.75 acres). High voltage electrical components within the fenceline will include the high-side 115-kV structure (the last structure before the conductors interconnect to the substation equipment), a 115/12.47 kV stepdown transformer, a short segment of 115-kV conductor from the high-side structure, and switch gear. Distribution level components within the fenceline will include switch gear, 8-foot by 8-foot electrical equipment enclosure, and bus work. Areas of the parcel that are not utilized for access, parking, or substation equipment will be revegetated.

3.3. Safety Equipment and Plans

The transmission system is equipped with numerous safety systems including monitoring and relaying equipment that will open the circuit to the transmission line (i.e., stop the flow of electricity) in the event of damage to a section of the transmission line. In addition, there are manual systems of switches that can be closed to direct energy to a transmission line or opened to stop the flow of energy to a transmission line. Some of these switches are manually operated and others equipped with a motor-operated device to allow remote opening or closing.

Safety risks to workers and the public during construction and operation include potential injuries from falls, equipment and vehicle use, unauthorized access, and electrical hazards. To mitigate these risks, Great River Energy will implement several safety measures. In accordance with 29 CFR 1926.1408, work zones will be clearly marked with defined boundaries to ensure equipment stays at least 15 feet away from 115-kV transmission lines, helping to prevent contact or arcing. Transmission lines will be deenergized using switches, lockout/tagout procedures, and applying grounding equipment, as outlined in 29 CFR 1910.269(m), to prevent accidental re-energization. Workers will be protected from falls by using appropriate fall protection equipment in compliance with 29 CFR 1926.1423. Great River Energy, its field representative, and Great River Energy's contractors will employ a variety of safety measures to prevent public contact in the event of a downed transmission line. Great River Energy and Meeker Energy will secure and mark work areas to prevent unauthorized access within the substation and construction zones. The address of the work site and the nearest hospital will be communicated during morning job briefings to facilitate prompt response in case of medical emergencies.

Vegetation management, which is described in **Section 5.1.6**, is also necessary to maintain safe clearances from the transmission lines.

3.4. Estimated Costs

Estimated costs for the Project are approximately \$8.2 million. Transmission line and substation costs are shown in **Table 4**. Transmission line costs will be about \$5.5 million. The proposed Kimball Substation will cost approximately \$2.7 million. Costs may vary depending upon, among other things, the cost of material and labor. Applicants currently anticipate that costs may vary $\pm$ 30 percent.

Table 4 Estimated Project Costs

Project	Total
Transmission Line	\$5,500,000
Substation	\$2,700,000
TOTAL	\$8,200,000

All capital costs for the transmission line infrastructure will be borne by Great River Energy. Costs related to the proposed Kimball Substation will be borne by Meeker Energy.

The estimated annual cost of ROW maintenance, operation, and general maintenance of all Great River Energy's transmission lines (69-kV to 500-kV) in Minnesota is approximately \$4,000,000 or 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, and other factors. The maintenance and operation of the proposed Kimball Substation is expected to cost approximately \$10,000 per year.

3.5. Project Schedule

The Applicants anticipate starting construction on the transmission line and the Kimball Substation in Q3 2028 and energizing the Project in Q2 2029. **Table 5** summarizes the Applicants' anticipated permitting schedule consistent with the milestones and timeframes set forth in Minn. Stat. Ch. 216I.

Table 5 Anticipated Project Schedule

Milestone	Timeframe
Route permit application filed	September 2026
Scoping meeting	October 2026
Public hearing	November 2026
Commission meeting	February 2027
Written order issued	March 2027
Start of construction	Third Quarter 2028
Project energization	Second Quarter 2029

3.6. Work Force Required

The Applicants anticipate that 15 to 27 daily contract workers (10 to 20 for the transmission line and 5 to 7 for the Kimball Substation) will be employed for the Project. Great River Energy and Meeker Energy will also have a construction supervisor onsite throughout the construction and restoration phases of the Project. The Applicants will comply with Minn. Stat. 216I.05, subd. 12(d) by paying no less than the prevailing wage rate and require all contractors and subcontractors to do the same.

Maintenance and operation activities will be conducted by existing Great River Energy and Meeker Energy staff.

3.7. Construction and Restoration Practices

The Applicants intend to employ their standard practices to construct and restore the Project. These standard practices have been established and incorporate BMPs to meet internal, state, and federal requirements, balance construction costs, and minimize impacts on landowners and the environment. Construction practices to be followed are described in more detail in **Sections 5.1.4** and **5.2.3**.

3.8. Operation and Maintenance Practices

Great River Energy and Meeker Energy will periodically perform inspections, maintain equipment, and repair damage to the transmission line and Kimball Substation. The Applicants will perform regular maintenance and inspections over the life of the facilities 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 easement and areas where obstructions or terrain require access outside of the easement, but within the terms of the easement agreement. If problems with the transmission line are found during inspection, repairs will be performed, and landowners will be compensated for any losses or damage incurred to their property because of the maintenance work.

Great River Energy's Transmission Construction and Maintenance Department will conduct vegetation surveys and remove vegetation that will interfere with the safe operation of the transmission line (see **Section 6.8.7**). A 3- to 7-year vegetation maintenance cycle is desirable. Maintenance practices include a combination of mechanical and hand clearing, along with targeted application of herbicides where allowed.

4. ALTERNATIVE ROUTES CONSIDERED AND REJECTED

4.1. Alternative Requirement

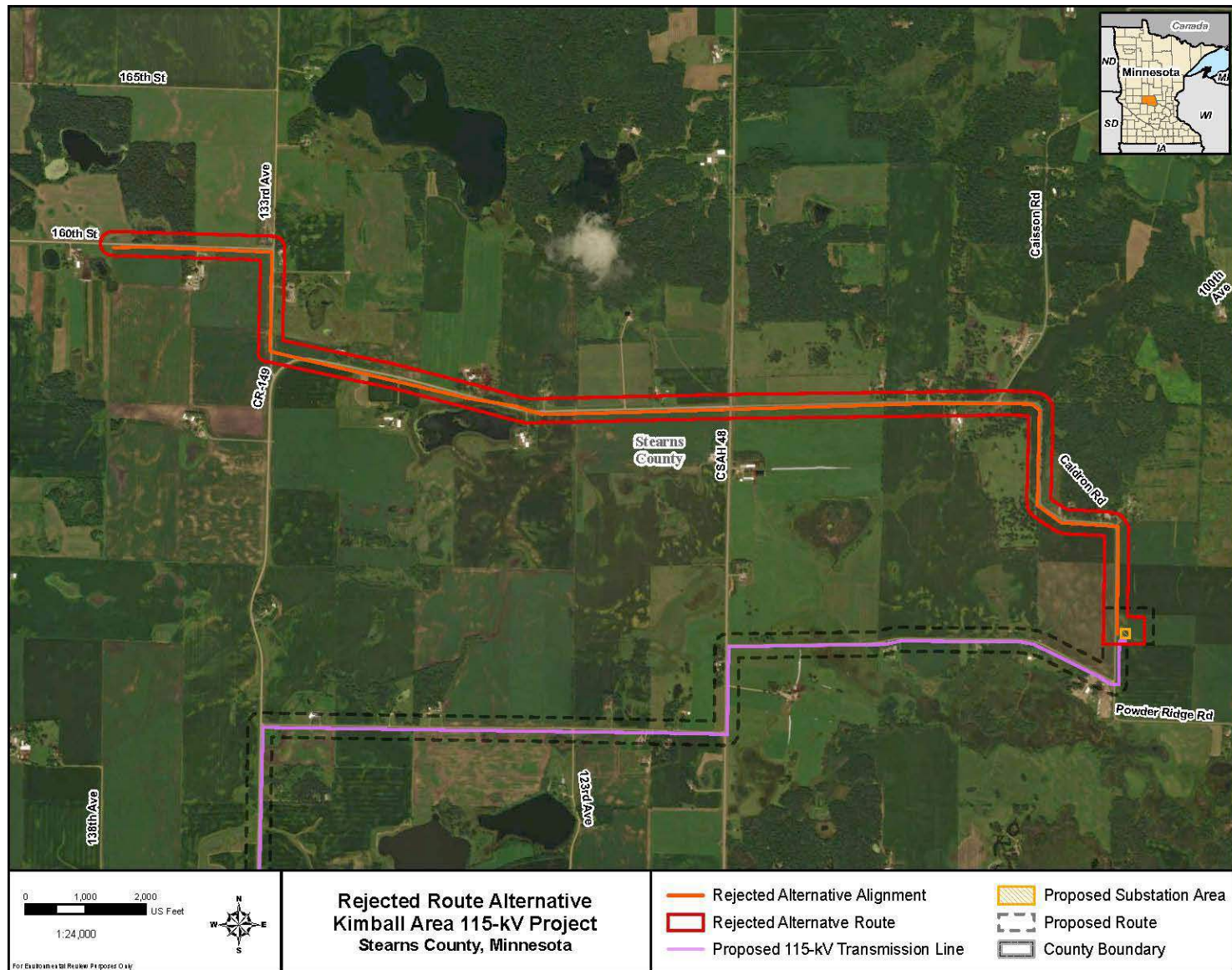
Minn. Stat. § 216L.05, subd. 3(b)(14), requires an applicant to identify any alternative routes that were considered and rejected for the Project.

Great River Energy considered an alternative route that would connect to Great River Energy's existing ME-BW transmission line in a different location. This route alternative was ultimately rejected in favor of the Proposed Route. Great River Energy did not consider any other existing rights-of-way as alternatives.

4.2. Route Alternatives Considered but Rejected

Great River Energy considered an alternative route that originated at the ME-BW 115-kV transmission line approximately 2 miles north of the proposed tap location near 160th Street. This rejected route alternative is shown on **Figure 7**. The rejected alternative turns south on 133rd Avenue then follows County Road 149 east, which turns into 155th Street. At Caldron Road, the rejected alternative turns south into the substation location.

Figure 7 Rejected Route Alternative



4.2.1. Human and Environmental Impact Considerations

Great River Energy reviewed publicly available environmental datasets to complete a high-level comparative analysis of the Proposed Alignment (i.e., the path that the transmission line will follow as proposed by Great River Energy) and the rejected route alternative (or, a conceptual path that this alternative would follow, as defined and studied by Great River Energy). A summary of the results is presented in **Tables 6, 7, and 8**.

Table 6 Comparison of Proposed and Alternative Alignments³

Resource / Characteristic	Proposed Alignment	Rejected Route Alternative	Source
Length (miles)	4.16	4.20	Measured in GIS
Collocation ^a with Utilities and Roads			
Distribution lines (miles)	3.67	2.84	Measured in Google Earth
Percent collocated	89%	68%	
Roads (miles)	4.14	4.08	Measured in GIS
Percent collocated	>99%	97%	
Land Use Features and Aesthetics			
Residences within 100 feet of the Proposed Alignment	2	0	Digitized from aerial photographs (2021)
Residences within 200 feet of the Proposed Alignment	4	5	Digitized from aerial photographs (2021)
No. of parcels crossed by the Proposed Alignment	19	17	https://www.mngeo.state.mn.us/choose/land_own_property.html (February 2024)
Environmental Resources			
Feet of wetlands crossed	2,830 feet	378 feet	National Wetland Inventory
Potential structures in wetlands	4	1	National Wetland Inventory
Prime farmland (Proposed Route)	182 acres	112 acres	Soil Survey Geographic Database Soils Data
^a Collocation is defined as any utility or road located within 50 feet either side of the Proposed Alignment. Measurements were made visually understanding the intention of the alternative and Great River Energy’s anticipated goal of aligning any alternative approximately 5 feet outside of road right-of-way.			

³ National Archives. 2026. *Code of Federal Regulations. Table A-1 to Subpart A of Part 98 – Global Warming Potentials, 100-Year Time Horizon*. Available at: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-A/appendix-Table%20A-1%20to%20Subpart%20A%20of%20Part%2098>. Accessed March 2026.

Table 7 Wetland Types Crossed by the Proposed and Alternative Alignments⁴

Wetland Type	Proposed Alignment	Rejected Route Alternative
	Feet Crossed	
Seasonally Flooded/Saturated Emergent Wetland	1,988	176
Shallow Marsh	842	202
TOTAL	2,830	378

Table 8 NLCD Land Cover Types Crossed by the Proposed and Alternative Alignments

Land Cover Type	Proposed Project	Rejected Route Alternative
	Miles Crossed	
Developed, Open Space	2.10	2.08
Developed, Low Intensity	1.11	0.76
Developed, Medium Intensity	0.00	0.00
<i>Developed Land Cover Type Subtotal</i>	<i>3.21</i>	<i>2.84</i>
Pasture/Hay	0.00	0.55
Cultivated Crops	0.95	0.81
<i>Agricultural Land Cover Type Subtotal</i>	<i>0.95</i>	<i>1.36</i>
Deciduous Forest	0.00	0.00
Woody Wetlands	0.00	0.00
Emergent Herbaceous Wetlands	0.00	0.00
<i>Natural Land Cover Type Subtotal</i>	<i>0.00</i>	<i>0.00</i>
TOTAL	4.16	4.20

4.3. Conclusions

The Proposed Alignment crosses an additional 2,452 feet of wetlands, most of which will be spanned. The Proposed Alignment and rejected route would result in similar human and environmental impacts. Ultimately, Great River Energy selected the Proposed Route for inclusion in this Application because it is marginally shorter and is collocated with existing road rights-of-way for >99 percent of its length and existing distribution for 89 percent of its length, as compared to 97 percent and 68 percent, respectively, for the rejected route alternative.

⁴ Minnesota Geospatial Commons. 2025. National Wetland Inventory for Minnesota.

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

Design and construction of transmission lines occur through multiple stages including identification of existing ROW; 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 Line

5.1.1. Structure Design

Great River Energy anticipates constructing the transmission line primarily with direct-embedded single-pole steel monopoles, 70 to 90 feet above ground and placed 400 to 500 feet apart; however, other structure types might be used as described below. Steel structures on concrete foundations or specialty structures (e.g., steel structures on a foundation, or direct-embedded with guying) may be required in some locations. The average diameter of the direct-embedded steel structures at ground level will be approximately 22 inches. Typical dimensions are provided in **Table 9**. Photos of typical structures are provided on **Figure 8**.

Table 9 Typical 115-kV Structure Dimensions

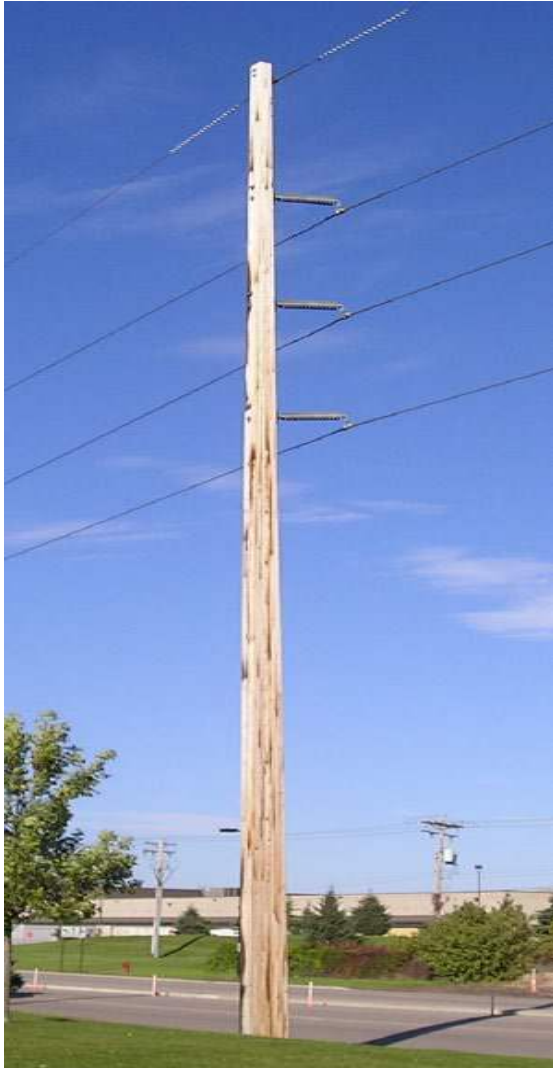
Structure Type	Material	Approximate Height Above Ground (feet)	Structure Base Diameter (inches)	Span Between Distances (feet)
Monopole with braced post	Wood, steel, or ductile iron	60 - 90	18 - 36	400 - 500
H-Frame	Wood, steel, or ductile iron	60 - 90	18 - 36	350 - 800
Three-pole	Wood, steel, or ductile iron	60 - 90	18 - 36	350 - 800

Steel structures on concrete foundations or direct-embedded steel structures with guying may be needed for angled structures; the size of these structures is dependent on the tension on the line, and/or the angle of deflection the structure location causes on the transmission line. Specific sizing of these structures will be determined after a Route Permit is issued when detailed engineering design will be initiated.

Figure 8 Photos of 115-kV Transmission Structures



Figure 8 (cont'd): Photos of 115-kV Transmission Structures



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 HVTLS. The horizontal configuration allows the transmission line to be as low as possible at the crossing point, while still maintaining the required clearances set by the NESC. In some cases where overhead clearances require the use of H-frame structures, it may be necessary to also bury the optical ground shield/communication wire. In such a situation, the optical ground wire will be directionally bored underground between the two structures adjacent to the H-frame structure. Great River Energy does not anticipate the Proposed Route will require H-frame or 3-pole structures because the Project does not need to cross any existing utility lines, and there are no FAA concerns.

A deadend structure is used to change direction or wire tension on a transmission line and at most highway crossings. 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 foundations and can have a larger cross section than typical structures. The specific locations of deadend structures will be determined after a Route Permit is issued and detailed engineering design is completed.

5.1.2. Conductors

The single circuit structures will have three phase wires and one shield wire. It is anticipated that the phase wires will be 477 thousand circular millimeter aluminum-conductor steel reinforced (i.e., 477 ACSR) or a conductor with similar capacity. The shield wire will be 0.555 optical ground wire.

5.1.3. Right-of-Way Acquisition Procedures

Great River Energy representatives will work directly with individual landowners to acquire the necessary easements and other land rights for the construction, operation, and maintenance of the transmission line. Great River Energy will typically obtain a total easement of approximately 100 feet (typically, approximately 50 feet of each side of the transmission line) for the 115-kV transmission line system. Great River Energy’s easement can overlap with road and other rights-of-way through permits or other agreements, which can reduce the amount of easement areas acquired from landowners. Where a transmission line of this size parallels roads, structures are typically installed 2 to 7 feet outside of road right-of-way, resulting in approximately 55 feet of ROW being needed from landowners outside of road right-of-way. **Figure 5** presents a conceptual arrangement of the 100-foot-wide Proposed ROW and transmission line alignment relative to road right-of-way.

Land rights acquisition typically begins after the Commission has designated a route for the Project. Great River Energy will provide the landowners with the transmission easement document and offer of compensation, as well as information on the Project schedule, construction practices, vegetation removal, and construction damages settlement procedures. Additional information may also be given to each landowner regarding preliminary structure placement (if available at that time), structure design or photos, and power line safety. Great River Energy will also respond to any comments or questions landowners might have, including those with respect to transmission line construction and operation practices. Great River Energy will continue to engage with landowners throughout the permitting process to answer any questions they may have regarding the easement acquisition process or the Project.

In addition to permanent easements necessary for the construction, restoration, operation, and maintenance of the Project, agreements may be obtained from certain landowners for temporary access, construction, or staging areas for storage of poles, vehicles, or other related items.

If a mutually acceptable agreement cannot be reached through Great River Energy’s work with landowners, Minnesota law provides that Great River Energy can use its rights of eminent domain to obtain the rights necessary for the Project (Minn. Stat. §§ 222.36, 301B.02, and 308A.201, subd.

13). If necessary, Great River Energy will commence a condemnation action, pursuant to Minn. Stat. Ch. 117, to obtain the necessary rights. Before the action is started, Great River Energy typically obtains an appraisal and provides it to the landowner. The landowner also has certain rights of reimbursement to obtain his or her own appraisal.

Great River Energy commences a condemnation action by filing a petition with the district court for the county in which the land is located. Great River Energy then serves all persons with an interest in the lands that are the subject of the action with the petition and other documents, including a notice of hearing. The district court conducts a hearing on Great River Energy's petition, and a landowner may object to the petition. If the court approves Great River Energy's condemnation petition, then the Court appoints an impartial panel of valuation commissioners.

The commissioners view the landowner's property and conduct a hearing at which the landowner and Great River Energy present their evidence about the fair market value impact that the easement(s) have on the property. The commissioners then issue an award setting the amount of compensation that Great River Energy must pay for the rights acquired. If a landowner or Great River Energy is not satisfied with the award, either may file an appeal in which the just compensation will be set following a trial. If no appeal is filed, Great River Energy will pay the amount of the award. At any point in the condemnation process, the landowner and Great River Energy can reach a settlement and dismiss the action.

5.1.4. Final Design and Construction Procedures

Prior to construction, Great River Energy will need to complete preliminary survey work and may need to acquire soil data in locations where special structures (e.g., deadend or turning structures) will be used. Great River Energy will give notice to and will work with landowners to access survey work, including locations where Great River Energy will conduct soil borings to determine soil suitability.⁵

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.

⁵ Survey work and geological studies do not fall within the scope of "construction" under Minn. Stat. § 216I. See Minn. Stat. § 216I.02, subd. 4 ("Construction does not include changes needed to temporarily use sites or routes for nonutility purposes, or uses in securing survey or geological data, including necessary borings to ascertain foundation conditions.").

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.

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.

The first phase of construction will involve survey staking of the transmission line structure locations and edges of the ROW. Following staking, the ROW will be cleared of trees and other woody vegetation to ensure safe and reliable access during construction, restoration, operations, and maintenance. Great River Energy will implement wire / border zone vegetation management practices as described in **Section 5.1.6**.

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 as otherwise agreed to with the property owner during easement negotiations or in accordance with agency requirements. Clearing in wetlands will be conducted when the ground and wetlands are frozen, or construction 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, Great River Energy will identify existing underground utilities using the Gopher State One Call process.

If temporary removal or relocation of fences is necessary, installation of temporary or permanent fencing or 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, by paying compensation 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, minimal grading of the immediate terrain will 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 are Project-specific, and are based on the proposed schedules for activities, prohibitions, maintenance guidelines, inspection procedures, required permits, 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 the construction of the transmission line are expected to adhere to these BMP requirements.

Most of the proposed structures will be installed directly in the ground by augering a hole that is typically 10 to 20 feet deep and 36 to 60 inches in diameter. 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. If a structure is located in a wetland, excavated soil from the wetland will be spread in an upland area or disposed of at an offsite facility. After a direct-embedded 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 70-to-95-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.

Most of the proposed structures will be steel poles, which may be directly embedded or set on a concrete foundation. The concrete foundations will be approximately 5 to 7 feet in diameter and generally are exposed 1 foot above the existing ground level. Concrete trucks will be used to bring the concrete in from a local concrete batch plant. This concrete batch plant will not be owned by the Applicants. Thus, it is not an associated facility of the Project.

After a number of structures have been erected, Great River Energy will begin to install the shield wire and conductors by establishing stringing setup areas within the ROW or temporary construction workspace as negotiated with the landowner. These stringing setup areas will be located at deadend structures and will occupy approximately 15,000 square feet (i.e., about one-third acre) for linear segments of the line and approximately 30,000 square feet (i.e., about two-thirds acre) 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.

5.1.5. Restoration Procedures

The Applicants have developed an AIMP (**Appendix H**) and a draft Vegetation Management Plan for this Project (**Appendix I**) that will be reviewed by the state interagency Vegetation Management Plan Working Group. The Vegetation Management Plan describes the objectives and plans for restoring or replacing any vegetation damaged during the construction process. Great River Energy will implement this plan after construction is completed.

Following construction, disturbed areas will be restored to their original condition to the maximum extent practicable, or as negotiated with the landowner. Post-construction restoration activities will include removing and disposing of debris, removing all temporary facilities (including staging and laydown areas), installing appropriate erosion and sediment 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 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, as negotiated with landowners. Great River Energy will monitor the ROW to ensure restoration occurs as planned.

Some temporary construction workspace may be needed for the Project. Once construction is complete, Great River Energy will remove and properly dispose of all material and debris, and repair any damage and perform restoration, as necessary. It is anticipated that minimal temporary construction workspace on property immediately adjacent to the ROW and on private property will be needed, except for limited equipment access and pulling areas.

Great River Energy will contact landowners after construction is complete to determine if they are satisfied with clean-up measures and if any other damage might have occurred. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition.

5.1.6. Operation and Maintenance

Great River Energy will access its easement to perform periodic inspections, conduct maintenance, and repair damage. Regular maintenance and inspections will be performed during the life of the transmission line generally in accordance with NERC requirements⁶ to ensure its continued integrity.

Great River Energy inspects the condition of its transmission lines and structures on an adaptive schedule. There is typically a post-construction review approximately 1 year after construction. After that, Great River Energy generally inspects its 115-kV transmission lines every 2 years. 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 with 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. ROW clearing practices will include a combination of mechanical and hand clearing, along with herbicide application (where allowed), to remove or control vegetation growth. Shrubs that will not interfere with the safe operation of the transmission line or accessing and traversing the ROW will be allowed to reestablish in the ROW.

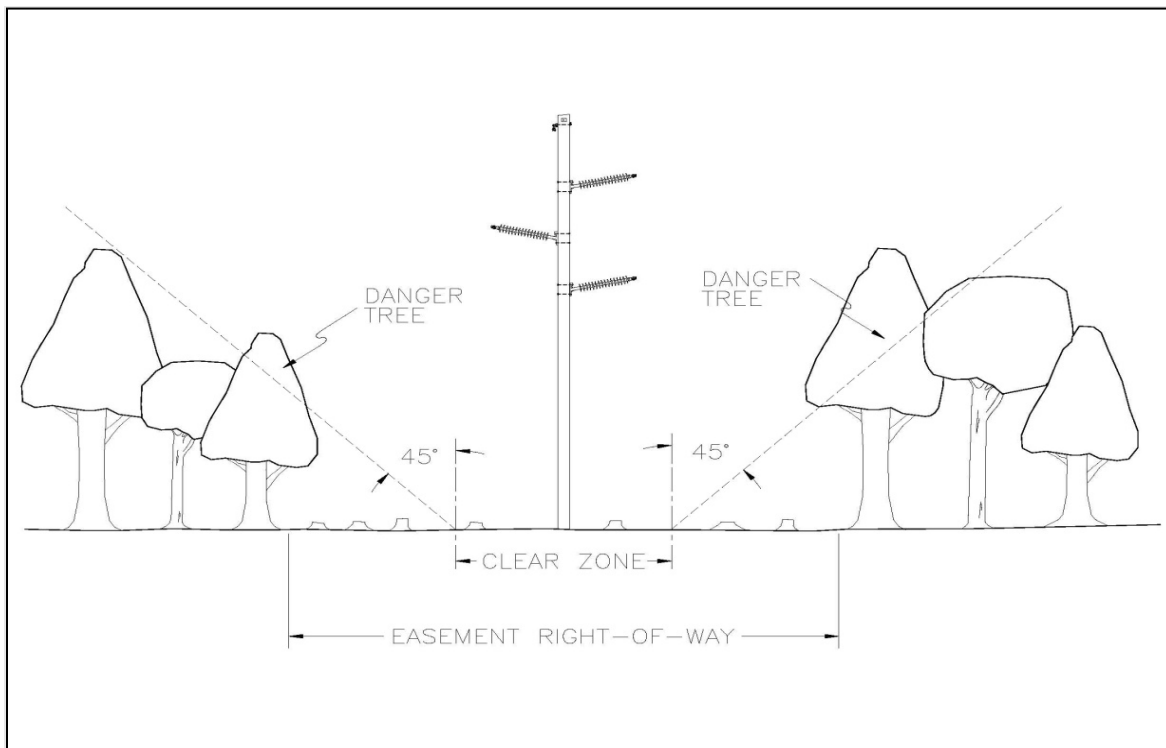
Great River Energy will use an integrated vegetation management approach that incorporates a wire / border zone practice for ROW clearing and maintenance. As a general practice, taller tree species that endanger the safe and reliable operation of the transmission facility will be removed. In developed areas and to the extent practical, existing low-growing shrubs and tree species that will not pose a threat to the transmission facility or impede construction or maintenance may remain in outer limits of the easement area (i.e., the border zone) as agreed to during easement negotiations. The area below the outer conductors plus 10 to 15 feet (i.e., the “wire zone” or “clear zone”) will be cleared of all shrubs and trees to ensure maintenance trucks can access the line and

⁶ NERC requirements apply to transmission lines rated ≥ 200 kV. Great River Energy follows NERC requirements for vegetation management as a best management practice.

no vegetation interferes with the safe operation of the transmission line. A 3- to 7-year cycle of vegetation maintenance is desirable.

The NESC states that transmission owners must, "... maintain a reliable electric transmission system by using a defense-in-depth strategy to manage vegetation located on transmission [ROW] and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation- related outages that could lead to Cascading."⁷ Consistent with this requirement, Great River Energy's easements typically specify that trees outside of the ROW, which are identified as "danger trees", may be removed or trimmed to eliminate the hazard based on negotiations with individual landowners. Danger trees are generally depicted on **Figure 9**. Danger trees generally are those that are dead, diseased, weak, or leaning towards the energized conductors.

Figure 9 Standard Tree Removal Practices during Transmission Line Operations



⁷ North American Electric Reliability Corporation. (n.d.) *FAC-003-05 Transmission Vegetation Management*. Available at: <https://www.nerc.com/globalassets/standards/reliability-standards/fac/fac-003-5.pdf>. Accessed August 2026.

5.2. Kimball Substation

5.2.1. Design and Land Requirements

The proposed Kimball Substation will be constructed on land to be purchased by Meeker Energy. The substation and graveled area (including parking area) will be approximately 0.75 acres. Additional design information is discussed in **Section 3.2.1** and shown on **Figure 3**.

5.2.2. Land Acquisition Procedures

Meeker Energy will purchase the property where the Kimball Substation will be located.

5.2.3. Construction Procedures

Site preparation will include stripping topsoil, and if necessary, hauling in structural fill to build up the subgrade for the substation pad.

Construction within the proposed Kimball Substation will consist of drilling pier foundations ranging in size from 3 to 5 feet in diameter and 8 to 15 feet deep. The foundations will be installed to support transmission line deadend structures, static masts, and bus and equipment support structures. Secondary oil containment for the transformer and reactor will use a geomembrane liner system. A ground grid will be installed 18 inches below the subgrade surface throughout the substation pad and extend 4 feet outside the security wall. Conduit for control and communication cables and grounding conductor will be installed prior to the placement of the final layer of crushed rock surfacing.

A portion of the parcel will be dedicated to access and a parking area.

5.2.4. Restoration Procedures

Temporary construction workspaces that are disturbed during construction and locations outside the final Kimball Substation footprint will be restored to their original condition to the maximum extent practicable. Post-construction restoration 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 occurs, the construction crew or a restoration contractor will use various methods to alleviate the compaction. Meeker Energy will implement the Vegetation Management Plan during restoration activities.

5.2.5. Operation and Maintenance

Meeker Energy will regularly inspect and maintain the Kimball Substation to ensure its continued integrity. The estimated annual cost of substation maintenance and operation is \$10,000.

6. ENVIRONMENTAL ASSESSMENT

Minn. Stat. 216I.07, subd. 3(a) requires that projects identified in Minn. Stat. 216I.07, subd. 2 prepare and submit an EA with the application. The Project meets the definition of a HVTL with a capacity between 100- and 300-kV as listed in Minn. Stat. 216I.07, subd. 2; therefore, an EA is required in this Application. The EA provided in this section contains information regarding the Project's human and environmental impacts and addresses mitigating measures for identified impacts.

The mitigation measures discussed throughout this EA include language typically included in Route Permits issued by the Commission. This text is meant to be illustrative of typical conditions but may not be consistent with any Route Permit issued by the Commission for this Project. Ultimately, the conditions within the Commission's Route Permit specific to this Project will be developed through the record in this proceeding.

6.1. Methodology and Definitions

Commission guidance recommends that applicants describe the methodology for characterizing potential impacts. This EA uses descriptions based on recent environmental documents prepared by the Minnesota Department of Commerce.

A potential impact is the anticipated change to an existing condition caused either directly or indirectly by the construction and operation of a proposed project. Potential impacts can be positive or negative and short or long term. Impacts vary in duration and size, by resource, and across locations. In certain circumstances, potential impacts can accumulate incrementally meaning that impacts from the Project would be in addition to on-the-ground impacts already occurring.

To provide appropriate context, the following terms and concepts are used to describe and analyze potential impacts:

- **Duration.** Impacts vary in length of time. Short-term impacts are generally associated with construction but might extend into the early operation phase. Long-term impacts are associated with operation. Permanent impacts extend beyond decommissioning and reclamation.
- **Size.** Impacts vary in size. To the extent possible, potential impacts are described quantitatively, for example, the number of impacted acres or the percentage of affected individuals in a population.
- **Uniqueness.** Resources are different. Common resources occur frequently, while uncommon resources are not ordinarily encountered.
- **Location.** Impacts are location dependent. For example, common resources in one location might be uncommon in another.

Impact intensity levels are described using a qualitative scale, which is explained below. These terms are not intended as value judgments, but rather a means to ensure mutual understanding among readers.

- **Negligible** impacts do not alter an existing resource condition or function and are generally not noticeable to an average observer. These impacts generally affect common resources over the short term.
- **Minimal** impacts do not considerably alter an existing resource condition or function. Minimal impacts might, for some resources and at some locations, be noticeable to an average observer. These impacts generally affect common resources over the short or long term.
- **Moderate** impacts alter an existing resource condition or function and are generally noticeable to the average observer. Impacts might be spread out over a large area making them difficult to observe but can be estimated by modeling. Moderate impacts can either affect common resources over the long term or permanently, or they can affect uncommon resources over the short or long term.
- **Significant** impacts alter an existing resource condition or function to the extent that the resource is impaired or cannot function. Significant impacts are likely noticeable or predictable to the average observer. Impacts might be spread out over a large area making them difficult to observe but can be estimated by modeling. Significant impacts can affect common or uncommon resources and be of any duration.

Also discussed are opportunities to mitigate potential impacts. Mitigation means:

- avoiding impacts altogether by not undertaking a certain project or parts of a project;
- minimizing impacts by limiting the degree of magnitude of a project;
- rectifying impacts by repairing, rehabilitating, re-creating, or restoring the affected environment;
- reducing or eliminating impacts over time by preservation and maintenance operations during the life of the project;
- compensating for impacts by replacing or providing substitute resources or environments; or
- reducing or avoiding impacts by implementing pollution prevention measures (or BMPs).

Some impacts can be avoided or minimized; some might be unavoidable but can be minimized; others might be unavoidable and unable to be minimized but can be corrected. The level at which an impact can be mitigated might change the impact intensity level. Where applicable, this Application also discusses permit conditions included in the current version of the Commission's standard draft Route Permit. The actual permit conditions applied to this Project will be the result of the record developed in this proceeding.

6.2. Regions of Influence

Potential impacts on human and environmental resources are analyzed within specific geographic areas called regions of influence (ROI). The ROI is the geographic area where the Project might exert some influence and is used as the basis for assessing potential impacts. ROIs vary by

resource. As necessary, potential impacts and mitigation measures beyond the identified ROI are discussed to provide appropriate context. Also, direct impacts within the ROI might cause indirect impacts outside the ROI.

Chapter 6 uses the following ROIs:

- Proposed ROW (50 feet on either side of the Proposed Alignment, plus the footprint of the Kimball Substation);
- Proposed Route (200 feet from approximate road centerline with limited exceptions near the substation location);
- Local Vicinity (1,600 feet);
- Project Area (1 mile); and
- County.

The ROIs are based on a distance from both sides of the Proposed Alignment developed by Great River Energy. **Table 10** summarizes the ROIs used by resource element.

Table 10 Regions of Influence

Resource Type	Element	Region of Influence
Human Settlement	Displacement	Proposed ROW
	Electrical Interference, Land Use and Zoning	Proposed Route
	Aesthetics, Noise, Property Values, Recreation	Local Vicinity
	Cultural Values, Environmental Justice, Public Services	Project Area
	Environmental Justice	Census Tracts
	Socioeconomics	County
Public Health and Safety	Electric and Magnetic Fields (including Stray Voltage), Implantable Medical Devices, Worker, and Public Safety	Proposed ROW
	Emergency Services	County
Land-based Economies	Agriculture, Forestry, Mining	Proposed Route
	Tourism	Local Vicinity
Archaeological and Historic Resources		Project Area
Natural Environment	Geology and Topography, Soils, Vegetation	Proposed ROW
	Public and Designated Lands, Surface Water and Wetlands, Groundwater, Wildlife (except birds), Wildlife Habitat	Proposed Route
	Wildlife (birds)	Local Vicinity
	Rare and Unique Resources	Project Area
	Air Quality, Climate Change and Resilience, Greenhouse Gas Emissions	County

6.3. Environmental Setting

The Project lies in the Eastern Broadleaf Forest Province, Minnesota & Northeast Iowa Morainal Section, and Hardwood Hills subsection, according to the MDNR Ecological Classification System. The MDNR describes the Hardwood Hills Subsection as:

- *Steep slopes, high hills, and lakes formed in glacial end moraines and outwash plains characterize this subsection. Presettlement vegetation included maple-basswood forests interspersed with oak savannas, tallgrass prairies, and oak forests. Much of this region is currently farmed. Where lakes are present, tourism is common.*⁸

The environmental setting of the Project Area includes several hydrologic features, such as wetlands, ditches, streams, and lakes. The Mississippi River is approximately 16 miles northeast. There are few waterbodies within the Project area. The Proposed Route crosses both forested and emergent wetlands, but does not cross streams or lakes.

Land use within the Project Area is primarily center-pivot irrigation crop land, with some trees between center-pivots. Rural residences exist as do several feed lots and some businesses. The closest towns to the Project Area include Watkins, about 2 miles southwest, and Kimball, about 4 miles to the southeast. There are transmission and distribution lines within the Project Area. The Proposed Route follows township roads and existing distribution lines for most of its length.

The landscape and characteristics of the Project Area are further described in the following subsections. The characteristics of the Project Area are typical of the surrounding area and do not preclude the development of this Project.

6.4. Human Settlement

6.4.1. Aesthetics

An evaluation of aesthetics is typically focused on visual impacts. Aesthetic impacts are subjective, because an individual's perceived changes to the landscape from a proposed infrastructure project can vary greatly.

Viewsheds contain both natural and built features and viewer sensitivity and view exposure will impact their expectations associated with a particular view. Viewers with high sensitivity are often engaged in recreational activities; traveling for pleasure; or experiencing a viewshed from a recreational area or their home. Low viewer sensitivity is often associated with people passing through an area or working. Exposure refers to the number of views, frequency and duration of views, and the view location, among other variables. Other factors, such as time of day, can affect the aesthetic impact on a viewshed.

⁸ Minnesota Department of Natural Resources. 2026. *Hardwood Hills Subsection*. Available at: <https://www.dnr.state.mn.us/ecs/222Ma/index.html>. Accessed April 2026.

The landscape in the local vicinity is fragmented with a mix of center-pivot agricultural land, rural residences, open space, paved and graveled county and townships roads, feedlots, and utility infrastructure.

The Project will primarily use direct-buried single-pole steel structures. Larger steel poles on concrete foundations might be needed for angles. Typical pole heights will range from 70 to 90 feet above ground and spans between poles will generally range from 400 feet to 500 feet.

Where the Project follows existing distribution line right-of-way, the Applicants anticipate Meeker Energy will bury the distribution lines. Design standards for a 115-kV line require taller structures than for distribution lines, but there will be fewer of them because the taller structure heights allow for longer spans between structures.

6.4.1.1. Potential Impacts

The ROI for aesthetics is the Local Vicinity. The proposed transmission line will be visible along the Proposed Route like other distribution and transmission lines in the Local Vicinity. The transmission line follows existing road right-of-way for its entire length, except where the transmission line turns into the Kimball Substation. The transmission line also follows existing distribution lines on either side of the roadway for its entire length; however, it does not overtake existing distribution in every location. The transmission line overtakes existing distribution lines along the east side of County Road 149, the south side of 145th Street, the east side of County Road 48, and the south side of Balkan Road. The substation will be constructed in an agricultural field.

Impacts associated with construction and operation of the Project will be long term, localized, of a small size, and will not impact a unique resource. Potential impacts will be minimal. The Project will not considerably alter the existing resource condition or landscape function.

Transmission lines and substations are common in rural areas and are compatible with rural residential aesthetics. The viewshed will remain similar to existing conditions. Visual impacts are subjective and will depend on the perceptions of the observers living within or traveling through the Local Vicinity. Although distribution lines currently exist in the viewshed, the visual contrast added by the taller transmission structures and lines might be perceived as a visual disruption for some individuals.

Tree clearing will occur. Clearing along existing road and distribution rights-of-way will incrementally increase the width of the existing ROW. Clearing will impact one residence where the transmission line does not follow existing distribution right-of-way along. Potential impacts to this residence, and those residences where incremental clearing will encroach into their tree line, are anticipated to be moderate.

6.4.1.2. Mitigation Measures

The primary strategies for minimizing aesthetic impacts are prudent routing, such as placing the transmission line away from residences and following existing infrastructure right-of-way to the greatest extent practical. Great River Energy will work with landowners to identify concerns related to Project aesthetics. The Proposed Alignment follows existing road rights-of-way for its >99 percent and existing distribution line right-of-way for 89 percent of its length.

In addition to these standard mitigation measures, Great River Energy will work with landowners to identify concerns related to Project aesthetics and compensate landowners for removal of trees and vegetation as part of easement negotiations.

6.4.1.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures relevant to aesthetics, including considering input from landowners and land management agencies prior to final structure location and using care to preserve the natural landscape.

6.4.2. Cultural Values

Cultural values include those perceived community beliefs or attitudes that define what is collectively important to the group. Cultural values provide a framework for community unity.

Cultural values are informed by the work and recreational pursuits of residents, as well as geographic features. The nearest cities to the Project are Watkins and Kimball. Within Meeker and Stearns Counties, there are multiple parks, trails, and open spaces. Willow Creek Park in Kimball, McCarthy Park and Veterans Park in Watkins, and Clear Lake County Park in Meeker County all provide opportunities for outdoor education and recreation. Trails traverse the county, including running and walking trails, Nordic and alpine ski trails, and snowmobile trails. Meeker and Stearns County is home to many lakes, and water recreation is an important part of the culture in the region. The Project Area is primarily agricultural and rural residential.

Prior to European contact, the land in the Project Area was "home to several indigenous [T]ribes, including the Ojibwa, Dakota, Sioux and Chippewa."⁹ There are no Tribally owned reservations or trust lands in the Project Area.

Most residents in Stearns and Meeker counties self-report as having European heritage, primarily German, Swedish, Irish, Norwegian, and Polish.¹⁰ To celebrate the areas German heritage, residents in Watkins celebrate Kraut N' Wurst Days annually on the first Saturday in August. The celebration is located in McCarthy Park and includes a parade, the Little Miss Watkins Pageant, a raffle, food and drink stands, and an evening street dance.¹¹

6.4.2.1. Potential Impacts

The ROI for Cultural Values is the Project Area. Construction of the transmission line and substation is not expected to conflict with the work or leisure pursuits of residents in the Project Area in such a way as to impact the underlying culture of the area. The Project will support electrical reliability in Stearns and Meeker counties. Given that existing electric transmission and distribution lines already exist in the Project Area and that the Project overtakes existing

⁹ Stearns County. n.d. *History*. Available at: <https://www.stearnscountymn.gov/703/History>. Accessed June 2026

¹⁰ U.S. Census Bureau. 2025. *American Community Survey. People Reporting Ancestry – ACS 5-Year Estimates Data Profiles, Table B04006*. Available at: <https://data.census.gov/table/ACSDT5Y2024.B04006?q=heritage&g=050XX00US27093.27145>. Accessed March 2026.

¹¹ City of Watkins. 2026. *Recreation – Kraut N' Wurst Days*. Available at: <http://www.cityofwatkins.com/kraut-n-wurst-days.html>. Accessed March 2026.

distribution line rights-of-way for three-quarters of its length, the Project is not expected to interfere with the sense of place in the Project Area.

6.4.2.2. Mitigation Measures

The Proposed Route is along existing road and distribution line right-of-way, which minimizes aesthetic changes to the landscape that could influence an individual's sense of place. No additional mitigation is proposed.

6.4.2.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures that address resources that contribute to community character and cultural values. These include measures related to agricultural land, public roads, restoration of disturbed areas, cultural and historic resources, recreation, and coordination with landowners, Tribal Nations, local governments, and other stakeholders. Implementation of these measures would help avoid, minimize, or mitigate potential indirect effects on cultural values during Project construction and operation by reducing disruptions to agricultural activities, recreation, community resources, and other features that contribute to local identity and quality of life.

6.4.3. Displacement

As discussed in **Section 3.1.6**, the NESC and Great River Energy maintain clearance standards between transmission lines and buildings within the right-of-way for the safe operation of the transmission line. Great River Energy strives to avoid displacing residences or other structures during its routing process.

Table 11 summarizes the buildings within the Proposed ROW and Proposed Route. There are residences, outbuildings, agricultural structures, or structures associated with businesses within those parameters of the Project. The structures nearest to the transmission line are residences and outbuildings, with few agricultural or business structures. The substation will be constructed on land that will be owned by Meeker Energy.

6.4.3.1. Potential Impacts

The ROI for Displacement is the Proposed ROW. No residences, buildings, or business structures will be displaced by the Project. The Project will be designed in compliance with local, state, NESC, Great River Energy, and Meeker Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths.

6.4.3.1. Mitigation Measures

Displacement of residences, buildings and businesses will not occur; therefore, no mitigation is proposed.

Table 11 Buildings within the Proposed Route and Proposed ROW

Building Type	Number of Structures	
	Proposed ROW	Proposed Route
Residence	0	4
Agricultural or Outbuilding	0	10
Business Structures	0	0
TOTAL	0	14

6.4.3.2. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures related to right-of-way acquisition, landowner coordination, agricultural impacts, and restoration, and compliance with these requirements also helps avoid and minimize the potential for displacement and associated property impacts.

6.4.4. Environmental Justice

The Commission defines an environmental justice area, consistent with Minn. Stat. § 216B.1691, subd. 1(e), as an area that meets one or more of the following criteria:

- 1) 40 percent or more of the area's total population is non-white;
- 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
- 4) the area is located within Indian country, as defined in United State Code, title 18, section 1151.¹²

Census tracts that intersect with the Proposed Route were analyzed for environmental justice areas. Census tracts are the best approximation of a geographic area where adverse impacts can occur from the Project. Census tracts are shown on **Figure 10**.

¹² Office of the Revisor of Statutes. 2024. *2024 Minnesota Statutes. 216B.1691 Renewable Energy Objectives*. Available at: <https://www.revisor.mn.gov/statutes/cite/216B.1691>. Accessed March 2026.

Figure 10 Census Tracts

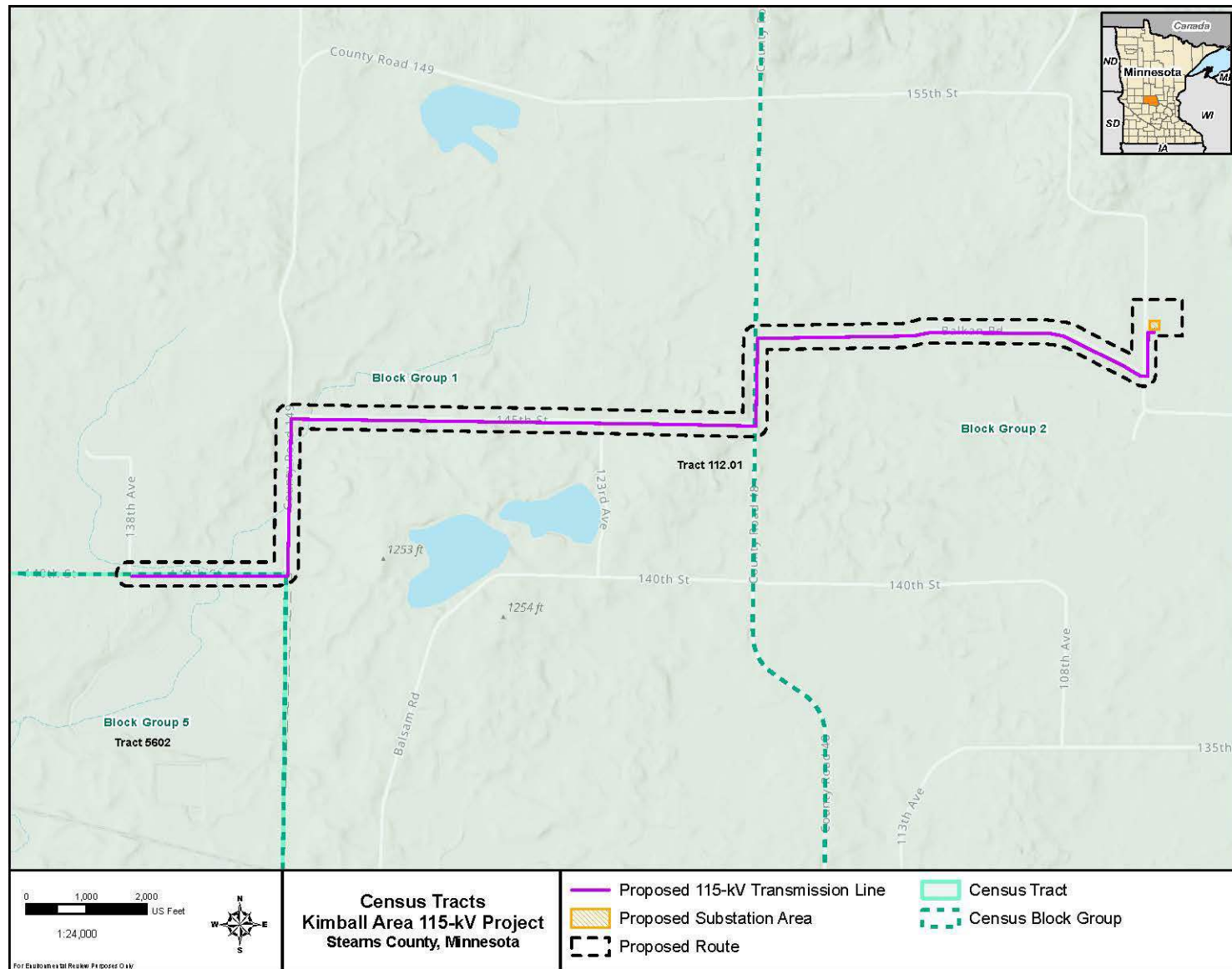


Table identifies minority populations by race and ethnicity, low-income populations, and populations with a language other than English spoken at home for census tracts crossed by the Project Route as well as Stearns County, Meeker County, and Minnesota. The most recent U.S. Census Bureau American Community Survey 5-Year Estimate Data were used when possible. Stearns County, Meeker County, and Minnesota were used as reference populations.

Table 12 Environmental Justice Data¹³

County/ Census Tract	2020 Population	Percent Total Minority ^a	All Individuals with Income Below 200 Percent of Poverty Level	Language Other Than English Spoken at Home
Minnesota	5,706,494	24.1%	22.2%	12.4%
Stearns County	158,292	19.8%	28.3%	12.0%
Census Tract 112.01	3,192	3.9%	19.5%	1.2%
Meeker County	23,400	7.8%	24.5%	3.0%
Census Tract 5602	5,164	11.2%	20.5%	1.0%
^a "Minority" refers to people who reported their ethnicity and race as something other than non-Hispanic White.				

As shown by the MPCA Understanding Environmental Justice in Minnesota web viewer,¹⁴ the Project does not cross federally recognized Tribal Areas. **Table 12** identifies minority populations by race and ethnicity, low-income populations, and populations with a language other than English spoken at home for census tracts crossed by the Project Route as well as Stearns County, Meeker County, and Minnesota. The most recent U.S. Census Bureau American Community Survey 5-Year Estimate Data (2024) were used when possible.

As shown in **Table 12**, no census tracts within the Project Area are considered environmental justice communities under the definition provided in Minn. Stat. § 216B.1691, subd. 1(e).

The Applicants reviewed the MPCA What's in My Neighborhood database.¹⁵ This database shows potentially contaminated sites and an inventory of businesses that have applied for environmental permits and registrations from the agency. Because a site is listed in the database does not necessarily imply a threat to the environment. There are approximately seven feedlots within the Project Area.

The MPCA developed the MNRISKS air toxics screening tool to "give a broader picture of the sources of air pollution in Minnesota and the potential health risks posed to residents from

¹³ U.S. Census Bureau. 2024. American Community Survey 5-Year Estimates (Tables: B03002 Hispanic or Latino Origin by Race; DP02 Selected Social Characteristics in the United States; S1701 Poverty Status in the Past 12 Months); 2020 Decennial Census (Table P1 Total Population).

¹⁴ Minnesota Pollution Control Agency. 2023. *Understanding Environmental Justice in Minnesota*. Available at: <https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page?views=EJ-areas>. Accessed March 2026.

¹⁵ Minnesota Pollution Control Agency. 2025. *What's in My Neighborhood*. Available at: <https://mpca.maps.arcgis.com/apps/webappviewer/index.html?id=9d45793c75644e05bac197525f633f87>. Accessed March 2026.

cumulative exposure.”¹⁶ According to the MPCA MNRISKS model, Census Tract 112.01 Block Group 1 has an air score of 0.10 and score is in the lowest 20 percent of air scores in Minnesota and the air quality is better than 80 percent of the state. Census Tract 112.01 Block Group 2 also has an air score of 0.10; however, the MPCA indicates this air score is in the lowest 30 percent of air scores in the state. Census Tract 5602 has an air score of 0.20, which is in the lowest 30 percent of air scores in the state. Additionally, air scores are below health benchmarks for all Block Groups. A health benchmark is “...an amount of air pollution that is unlikely to result in health effects in sensitive populations after a lifetime of exposure.”¹⁷

6.4.4.1. Potential Impacts

The ROI for Environmental Justice is the census tracts crossed by the Project. There are no statutorily defined environmental justice communities impacted by the Project.

6.4.4.2. Mitigation Measures

The Project does not occur within environmental justice communities; therefore, no mitigation is proposed.

6.4.4.3. Typical Route Permit Conditions

Typical route permit conditions related to public engagement, landowner coordination, construction practices, restoration, agricultural protection, cultural resources, and environmental protection would apply within identified environmental justice communities and would help avoid, minimize, or mitigate potential Project impacts.

6.4.5. **Land Use and Zoning**

Under Minn. Stat. § 216I.18, subd. 1, a route permit from the Commission supersedes and preempts local zoning, building, or land use rules. Though zoning and land use rules are superseded, the Commission’s site permit decision must be guided, in part, by consideration of impacts to local zoning and land use in accordance with the legislative goal to “minimize human settlement and other land use conflicts.”¹⁸ Discussion of land use and zoning in this section are intended to provide understanding of local regulations and long term goals and describe how the Project might impact existing land uses and future development.

Except for where the transmission line right-of-way overlaps existing road rights-of-way and at the Kimball Substation, the Project will be located entirely on private land. Land use is primarily agricultural row crops, with farmsteads and other residences located along roadways. Land cover is shown on **Figure 11**. Land cover types within the Proposed Route include a mix of developed open space (24 percent); low intensity developed (9 percent); medium intensity developed (<1

¹⁶ Minnesota Pollution Control Agency. 2023. *MNRISKS: Minnesota statewide screening of health risks from air pollution*. Available at: <https://www.pca.state.mn.us/sites/default/files/aq9-29.pdf>. Accessed May 2026.

¹⁷ Minnesota Pollution Control Agency. 2023. *Understanding Environmental Justice in Minnesota, MNRISKS Air Pollution Score*. Available at: https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page?views=Air-pollution-score#data_s=id%3AdataSource_17-190fface219-layer-6%3A2992. Accessed March 2026.

¹⁸ Minn. Stat. 216I.05, subd. 11((a)(2)).

percent); cultivated crops (51 percent); pasture/hay (11 percent); deciduous forest (<1 percent); woody wetlands (<1 percent); and emergent wetlands (4 percent). Land cover types within the Local Vicinity is primarily cultivated crops and pasture/hay.

Stearns County divides its zoning into districts. These districts regulate land use and placement of structures in the county. The Project is zoned agricultural. There are three variations of the Agricultural District (A-160, A-80, and A-40) that coincide with the number of residential dwellings within that number of acres. The Project is within the A-80 District.¹⁹ "The purpose of this district is to preserve the agricultural and rural character of the land. Agriculture is the predominate land use, however, a few single-family dwellings and hobby farms exist within this district. Because of the proximity to slower growing rural areas, additional residential development may be allowed at a low density of not more than one residence per eighty (80) acres."²⁰

Meeker County intends for the Project Area to remain in agricultural production.²¹ Meeker County's Agricultural Preservation District is intended to maintain, conserve, and enhance agricultural land; protect land from unnecessary urban encroachment; protect and preserve natural resource areas; and stabilize increases in public expenditures for public services.²² Meeker County has a zoning protocol for development that takes place on county land. In order to commence any form of development or construction, one must obtain a specific land use permit, which is dependent upon the type of project.

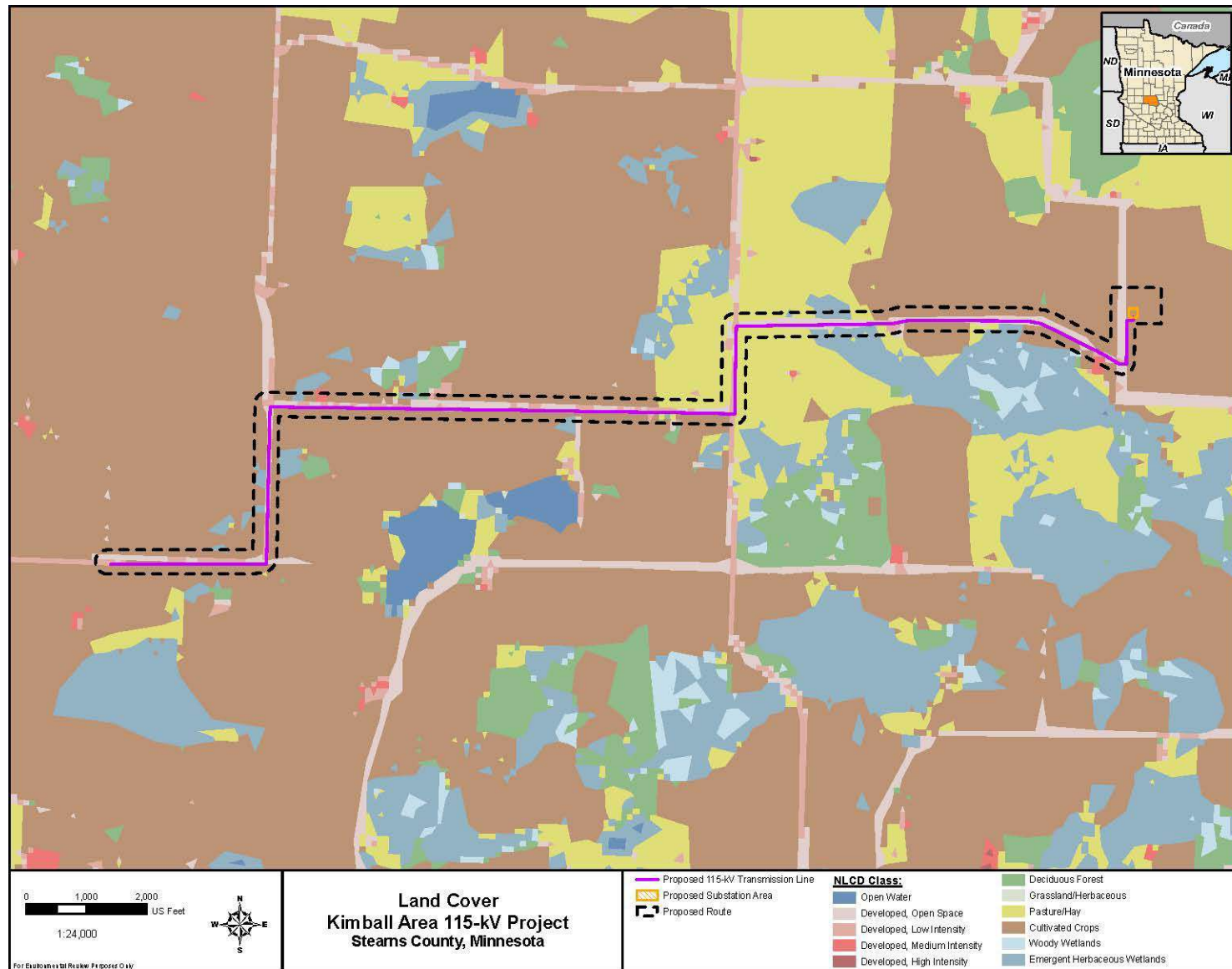
¹⁹ Stearns County. 2025. *Stearns County Official Zoning Map*. Available at: <https://content.civicplus.com/ap/assets/d494293a-1d06-4969-933c-9c3b510cb29b>. Accessed April 2026.

²⁰ Stearns County. n.d. *Zoning Districts*. Available at: <https://www.stearnscountymn.gov/945/Zoning-Districts>. Accessed April 2026.

²¹ Meeker County. 2007. *Comprehensive Future Land Use Map*. Available at: <https://www.co.meeker.mn.us/DocumentCenter/View/3124/Comprehensive-Land-Use-Plan--Future-Land-Use-Map-9Apdf>. Accessed April 2026.

²² Meeker County. December 2024. *Meeker County Land Development Ordinances, Section 11.00*. Available at: https://library.municode.com/mn/meeker_county/codes/land_development_ordinance?nodeId=LADER_PTIV_ZOOR_ART11AGPRDI_S11.00IN. Accessed April 2026.

Figure 11 Landcover (NLCD)



The Stearns County 2030 Comprehensive Plan highlights several broad categories, including land use, natural resources, parks, transportation, and economic development.²³ The Comprehensive Plan establishes goals related to land use. These include minimizing conflicts between agricultural and other land uses, identifying areas for industrial and non-farm development, and coordinating infrastructure expansion with development. The Project supports these goals, as it does not impede future agricultural use.

According to the Meeker County Strategic Plan, County priorities for the years 2025 to 2027 include financial stewardship, assets and amenities, quality economic growth, and organizational excellence. The planned strategy for improving assets and amenities includes “providing functional and modern facilities that support the needs of the county and community.”²⁴ The Project will improve electrical reliability thereby supporting economic growth and modern facilities.

6.4.5.1. Potential Impacts

The ROI for Land Use and Zoning is the Proposed Route. Potential impacts are expected to be long term but minimal. The transmission line is not expected to alter current and future land use, including agricultural uses. Construction of the substation will convert land zoned as agricultural to an industrial use.

6.4.5.2. Mitigation Measures

The Project is not expected to alter current or future land use, and the Project will not impact zoning. Short-term agricultural impacts during construction will be mitigated by Great River Energy through restoration and compensatory payments. The Applicants do not propose additional mitigative measures specific to land use and zoning.

6.4.5.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures that address land use / land cover, as well as agricultural land, soil and vegetation management, restoration, aesthetics, recreation, and coordination with landowners and local governments, which help avoid and minimize effects on land use / land cover.

6.4.6. Noise

Human hearing is not equally sensitive to all frequencies of sound. Thus, 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.

²³ Stearns County. 2026. *Stearns County 2030 Comprehensive Plan*. Available at: <https://www.stearnscountymn.gov/957/Stearns-County-2030-Comprehensive-Plan>. Accessed April 2026.

²⁴ Meeker County Strategic Plan. 2025. *Sowing the Seeds of our Future*. Available at: <https://www.co.meeker.mn.us/DocumentCenter/View/7857/2025-2027-Strategic-Plan>. Accessed April 2026.

A Guide to Noise Control in Minnesota, published by the MPCA, indicates that a noise level change of one dBA is not noticeable.²⁵ A three-dBA change is considered the “threshold of perception” or the lowest change in sound level that is generally perceptible to human hearing. A five-dBA change in noise level is a noticeable change. 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 (i.e., four times as loud). **Table 13** shows noise levels associated with common, everyday sources.

Table 13 Common Noise Sources and Levels²⁶

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	Quiet urban daytime
40	Library, quiet urban nighttime
30	Bedroom at night
20	Quiet rural nighttime
10	Broadcast recording studio
0	Threshold of hearing

Established daytime and nighttime noise standards by Noise Area Classifications (NACs) are provided in **Table 14**. These standards, outlined in Minn. R. 7030.0040, are expressed as limiting levels of dBA within a 1-hour period; L₅₀ is the dBA not to be exceeded over 50 percent of the time (30 minutes) within an hour, while L₁₀ is not to be exceeded over 10 percent of the time (6 minutes) within the hour.

Table 14 MPCA Noise Limits by Noise Area Classification (dBA)

Applicable Noise Area Classification	Description	Daytime (7 a.m. – 10 p.m.)		Nighttime (10 p.m. – 7 a.m.)	
		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
Note: This table identifies the classifications potentially relevant to this Project. See Minn. R. 7030.0050 for the complete text of the rule.					

²⁵ Minnesota Pollution Control Agency. 2015. *A Guide to Noise Control in Minnesota*. Available at: <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>. Accessed March 2026.

²⁶ *Ibid.*

NACs are based on the land use activities at the location of the receiver. Noise standards are applicable to that land use activity. NACs are listed in the MPCA noise regulations to distinguish the categories. Residential areas, churches, educational and health services, and similar 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, which includes agricultural land.

As presented in **Table 14**, the most stringent applicable MPCA noise standard for a NAC 1 property is the L₅₀ daytime and nighttime standards equivalent to 60 dBA and 50 dBA, respectively. Households, including farmhouses, are classified as NAC 1 under Minn. R. 7030.0050. Agricultural land is classified as NAC 3. The NAC 3 daytime and nighttime standard is 75 dBA for both time periods.

6.4.6.1. Potential Impacts

The ROI for Noise is the Local Vicinity. Construction-related impacts are expected to be short term and minimal. Operational impacts are anticipated to be of a small size, long term, and not impact unique resources. Potential impacts will be negligible to minimal.

The primary noise receptors within the local vicinity are residences and farmsteads. Residences are assigned to NAC 1. **Table 15** presents the distance of noise-sensitive receptors, or residences, from the Proposed Alignment. Residences are shown on the detailed maps in **Appendix B**.

Table 15 Noise-sensitive Receptors from Transmission Line

Feet	0 to 50	50 to 100	100 to 200	200 to 400	400 to 800	800 to 1,600
Residences	0	2	2	4	3	6

Construction

Construction noise is expected to occur during daytime hours as the result of heavy equipment operation and increased vehicle traffic associated with the transport of construction personnel and materials to and from work areas. Occasionally, there might be construction outside these hours or on a weekend if Great River Energy and Meeker Energy must work around customer schedules, line outages, or if the schedule has been significantly impacted due to delays or other factors. Construction activities will be performed with standard heavy equipment such as backhoes, cranes, boom trucks, and assorted small vehicles.

Crews will work from structure location to structure location when constructing the transmission line. Crews will return to a location during the separate phases of construction: clearing and grading, material delivery, auguring structure and foundations holes, setting structures, and stringing conductors. As such, crews will be present at any given location for a few days but will not be present along the entire right-of-way at any given period. Construction at the substation will occur intermittently but be located at the same location. The closest residence to the substation is over 2,000 feet west and screened by vegetation.

Noise associated with construction of the Project will be short term and minimal. Upon completion of construction activities, noise associated with construction equipment will cease.

Operation

During operation, transmission lines can generate a small amount of sound energy from the corona effect, a small electrical discharge caused by the localized EF near energized components and conductors that ionize the surrounding air molecules. Corona noise from a transmission line occurs under foggy, damp, or rainy weather conditions and can create a crackling sound. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. The Center for Hearing and Communication indicates that rainfall is commonly measured at 50 dBA.²⁷ 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 L₅ and L₅₀ for audible noise emissions. The worst-case scenario is when the transmission line is exposed to heavy rain conditions defined as 1 inch per hour. Anticipated noise levels for heavy rain conditions for a typical 115-kV line based on modeled results from PLSS-CADD and the Bonneville Power Administration Corona and Field Effects Program, Version 3.1, are listed in **Table 16**.

Table 16 Anticipated Transmission Line Noise Levels in Heavy Rain

L ₅	L ₅₀	Location
25.0 dBA	21.5 dBA	right-of-way edge
28.7 dBA	25.2 dBA	directly under line

As shown in **Table 16**, operational noise levels produced by a 115-kV transmission line are not usually perceivable and will be within MPCA noise limits.

During operation, the primary noise source associated with the Kimball Substation will be the transformer. Meeker Energy is planning to obtain a transformer with a typical noise specification of 75 dBA or less with the cooling fans running. Noise levels will attenuate to 50 dBA within approximately 55 feet of the transformer. Point source noise drops six dBA for every doubling of distance. For example, a 50 dBA sound at 50 feet is perceived as a 44 dBA sound at 100 feet. Noise from the transformer will decrease to less than 20 dBA at the nearest residence, which is just over 1,000 feet south/southwest of the substation. This is well below NAC 1 noise standard and does not take into account other environmental mitigating factors between the substation and the residence, such as vegetation, which can reduce perceived noise levels. As such, appreciable operational noise impacts are not anticipated because of the new Kimball Substation.

6.4.6.2. Mitigation Measures

Great River Energy and Meeker Energy will require its employees and contractors to equip heavy equipment with sound attenuation devices such as mufflers to minimize the daytime noise levels. To mitigate noise impacts, work will generally be limited to daytime hours between 7 a.m. and 9 p.m. on weekdays. Great River Energy and Meeker Energy will work with landowners in the event

²⁷ Center for Hearing and Communication. 2025. *International Noise Awareness Day. Common Noise Levels – How Loud is Too Loud?* Available at: <https://noiseawareness.org/info-center/common-noise-levels/>. Accessed March 2026.

construction becomes necessary outside of daytime hours. Once operational, the Project is not anticipated to contribute to an exceedance of noise standards.

6.4.6.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include a requirement that permittees comply with applicable Minnesota noise standards and limit construction and maintenance to daytime hours to the extent practicable.

6.4.7. **Public Services and Transportation**

The Project is in a principally agricultural and rural residential area. Private landowners in the Project Area have their own private wells and individual septic systems. Residents access other utility services from various providers, including waste collection, natural gas/propane, television, and telephone. Existing infrastructure is shown on **Figure 12**.

Communications

Local internet is provided primarily by Arvig.²⁸ Local telephone service is provided by Melrose Telephone Company.²⁹ A variety of mobile telephone companies provide service in the area.

Transportation

Roads in the Project Area include State Highways 15 and 55 and county and township roads. As part of the route development process, Great River Energy evaluated opportunities to parallel existing road right-of-way, and the Proposed ROW is collocated with road right-of-way for the entirety of its length. The Proposed ROW will parallel or intersect with the roads listed in **Table 17**. The specific width of road rights-of-way vary and are determined during survey and title work conducted prior to construction. The Project's Proposed Alignment along existing road rights-of-way is shown on the detailed maps in **Appendix B**.

The Canadian Pacific Kansas City Railroad operates a railway southwest of the Project. Minnesota State Highway 55 parallels this railway.³⁰

²⁸ City of Watkins. 2026. *City Services and Other Utilities*. Available at: <http://www.cityofwatkins.com/city-services-and-other-utilities.html>. Accessed March 2026.

²⁹ MN Department of Commerce. 2026. *Minnesota Telephone Exchange Boundaries*. Available at: <https://experience.arcgis.com/experience/b1a26b60ce9141aa86c4cb7391bb8940>. Accessed March 2026.

³⁰ Canadian Pacific Kansas City Railroad. 2026. *Connecting a Continent*. Available at: <https://www.cpkcr.com/en/our-advantage/connecting-a-continent>. Accessed March 2026.

Figure 12 Existing Infrastructure

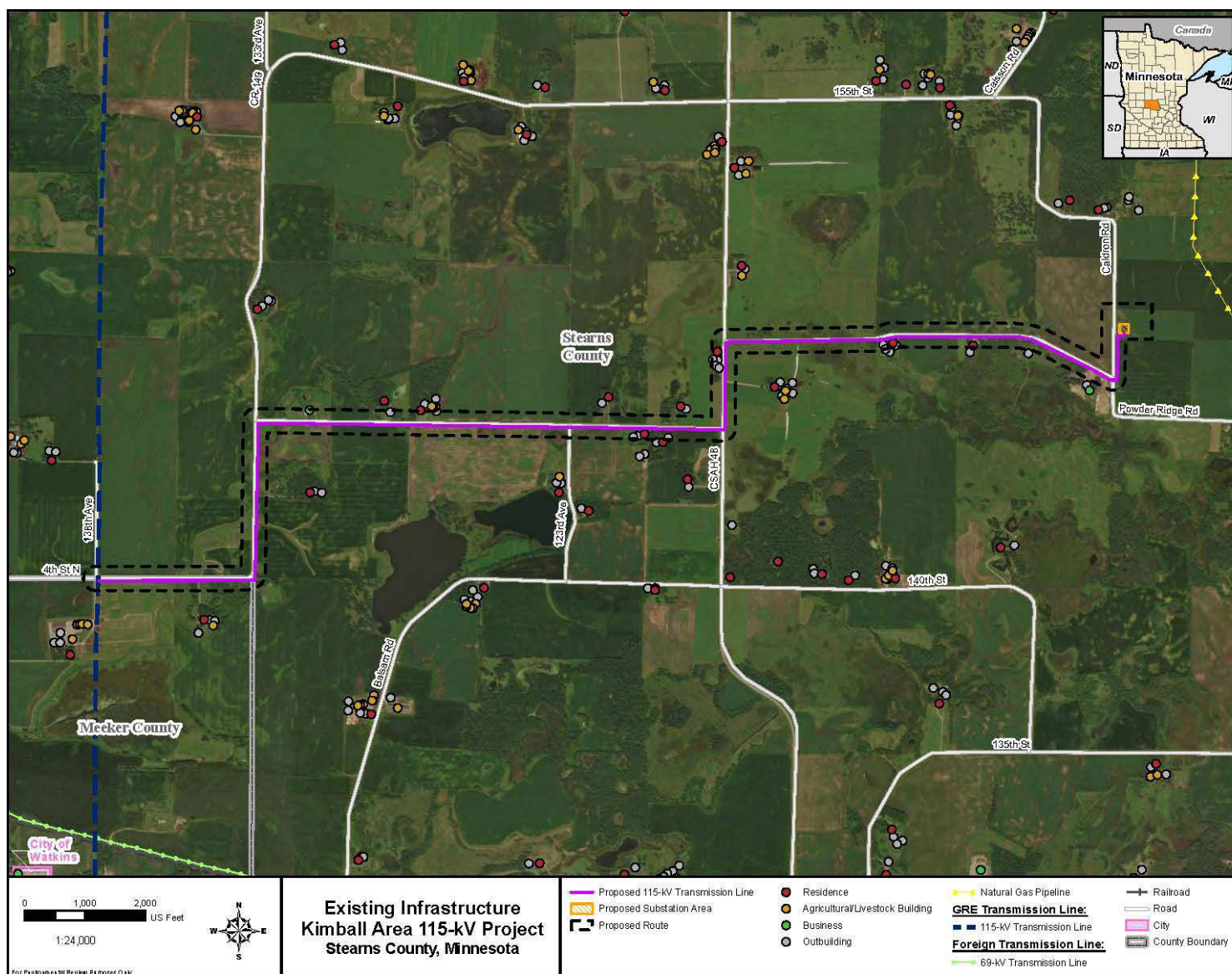


Table 17 Highways or Roads Crossed by the Proposed ROW³¹

Project Mileposts	Highway / Road Name	Jurisdiction	Parallel / Intersect	Traffic Volumes (SEQ#/AADT/ Year) ^a
0.0	138 th Ave	City of Watkins	Intersect	Not Available
0.0-0.5	140 th St	City of Watkins	Parallel	Not Available
0.5-1.0	County Road 149	Stearns County	Parallel	22637/181/2024
1.0-2.5	145 th St	City of Watkins	Parallel	Not Available
2.5-2.75	County Road 48	Stearns County	Parallel	Not Available
2.75-4.0	Balsam Rd	City of Watkins	Parallel	Not Available
4.0-4.2	Caldron Rd	City of Kimball	Parallel	Not Available

St. Cloud Airport is approximately 20 miles northeast of the Project in the city of St. Cloud and Litchfield Municipal Airport is approximately 16 miles southwest of the Project in the city of Litchfield. Maple Lake Municipal Airport is approximately 18 miles southeast of the Project in the city of Maple Lake.

Utilities

Several existing overhead transmission and distribution lines are in the Project Area. The existing ME-BW 115-kV transmission line travels north/south through the western portion of the Proposed Route. Xcel Energy maintains the existing 69-kV transmission line that partially parallels the south side of State Highway 55 and partially parallels the north side of the Canadian Pacific Kansas City railroad.

Xcel Energy and Meeker Energy provide electrical distribution services in the Project Area. The Project follows these existing distribution lines, on either side of the roadway, for its entire length. The proposed transmission line overtakes existing distribution lines along the south side of 140th Street, the east side of County Road 149, the south side of 145th Street, the east side of County Road 48, and the south side of Balkan Road for 89 percent of its length.

A natural gas mainline owned by Northern Natural Gas Company is located east of the Project Area.³²

6.4.7.1. Potential Impacts

The ROI for Public Services and Transportation is the Project Area. During construction, short-term, intermittent impacts will occur. These impacts will be minimal. Operational impacts are anticipated to be negligible. The transmission line is not expected to alter the existing condition or function of existing public services or transportation networks. Potential impacts will be temporary, of a small size, and not affect unique resources.

³¹ Minnesota Department of Transportation. 2025. *Traffic Count*. Available at: <https://mndot.public.ms2soft.com/tcds/tsearch.asp?mod=tcds>. Accessed March 2026.

³² U.S. Department of Transportation. 2026. *Pipeline and Hazardous Materials Safety Administration – National Pipeline Mapping System*. Available at: <https://pvnpm.phmsa.dot.gov/PublicViewer/>. Accessed March 2026.

Communication

The Project is not expected to interfere with local communications. See **Section 6.5.1** for a discussion about electronic interference.

Transportation

The Project is approximately 16 miles away from the nearest municipal airport; therefore, no impacts to airport operations will occur. Title 14 CFR Part 77 requires that anyone building a structure near an airport report their intentions to the FAA. Several locations along the transmission line were screened using the FAA's Obstruction Evaluation/Airport Airspace Analysis Pre-Screening Tool. A 199-foot structure height was used to ensure an overly conservative analysis. No points along the transmission line and substation location required notice be filed to the FAA.

Great River Energy will primarily travel down the right-of-way during construction of the transmission line. However, access to the right-of-way will be required from nearby roadways. Temporary and infrequent traffic impacts associated with equipment and 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 carried across the road, which is then pulled overhead. Temporary structures may be installed inside or outside of road right-of-way to ensure pulling lines, conductors and shield wire have sufficient clearance over roads. Great River Energy will comply with licenses and permits regarding road crossings.

Short term closure of roads is possible when stringing conductors. Any potential closures and temporary detours are expected to be short (i.e., minutes to hours). Access along township roads is not expected to change during construction of the Project. Operation of the Project is not expected to impact County Road 48, County Road 149, or local roads.

Utilities

There may be some minimal disruption of electrical service to Xcel and Meeker Energy's customers. Because the Project is proposed to be routed along existing distribution lines and road rights-of-way, Great River Energy does not anticipate impacts to site improvements such as wells or septic systems.

6.4.7.2. Mitigation Measures

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 traffic. Construction operations will be conducted in a manner that causes the least possible obstruction and inconvenience to the traveling public. The Applicants and their contractors will plan and execute delivery of heavy equipment in coordination with the appropriate road authorities and in a manner that will avoid traffic congestion and reduce the likelihood of dangerous situations along local roadways.

To ensure that any short-term and infrequent traffic impacts are minimized, the Applicants will coordinate with all affected road authorities. To the extent practicable, Great River Energy will schedule large material and equipment deliveries to avoid periods when traffic volumes are high.

Great River Energy will coordinate Project construction schedules, including any outages, with Xcel Energy and Meeker Energy to minimize electrical service disruptions to their customers. Existing utilities and site improvements, such as septic systems and wells, will be identified during survey activities. Based on the location of these features, the transmission line will be designed to meet or exceed required clearances and pole locations. No structure locations will be placed on existing utilities.

6.4.7.3. Typical Route Permit Conditions

- Route permits issued by the Commission typically include conditions and mitigation measures relevant to public services and transportation. For example, permittees are typically required to notify and coordinate with local road authorities and minimize disruptions to public services and public utilities.

6.4.8. Recreation

Recreational opportunities in Meeker County and Stearns County include fishing, boating, water sports, swimming, biking, hiking, hunting, Nordic and alpine skiing, snowboarding, and snowmobiling, among other activities. The Alice Hamm Wildlife Management Area (WMA) is within the Local Vicinity. "This WMA is situated in an area of marginally drained cropland. Shrub/cattail marshes and restored native prairie are the main habitat components."³³ Access to the WMA is from the northeast from Caldron Road.

No other state lands within the Local Vicinity including state parks, state forests, state trails, wildlife management areas, aquatic management areas, or scientific and natural areas. The Proposed Route does not cross designated state or national wilderness areas, nor does it cross national parks. No federal or county parks, or federal forests or refuges are within the Local Vicinity. The Project does not cross listed snowmobile trails. Recreational activities likely occur on private lands within the Local Vicinity.

Powder Ridge Ski Area is approximately 1.0 mile east of the Project. There are multiple waterbodies located around the Project Area. Carter Lake is approximately 0.25 mile south of the transmission line. Located adjacent to Carter Lake is an unnamed waterbody, which is also approximately 0.25 mile south of the transmission line. There is no public water access to these waterbodies. The closest snowmobile trail meanders through agricultural fields north of 140th Street and 145th Street. Ditch riding may occur.

³³ Minnesota Department of Natural Resources. 2026. *Alice Hamm WMA*. Available at: https://www.dnr.state.mn.us/wmas/detail_report.html?id=WMA0143100. Accessed May 2026.

6.4.8.1. Potential Impacts

The ROI for Recreation is the Local Vicinity. Negative impacts on public recreational opportunities are not expected to occur. Potential impacts at the Alice Hamm WMA are anticipated to be negligible.

Impacts associated with construction and operation of the transmission line will be negligible given the transmission line will be constructed along existing road right-of-way. These incremental impacts are not expected to be noticeable to the average recreationalist participating in recreational activities within the Local Vicinity. The Project will be visible to those entering the Alice Hamm WMA; however, the viewshed will be partially blocked by a parking area associated with a trucking company. This parking area dominates the viewshed in this location. Noise impacts during construction of the Project will be intermittent. Operational noise will be below ambient noise levels. The Proposed Alignment follows existing roads and distribution lines, minimizing visual disturbances to recreational users. Any required tree clearing will be incremental along existing right-of-way. The Proposed Route avoids areas that are considered tourist destinations and avoids public lands.

The Project will support snowmaking at the Powder Ridge ski hill.

The Proposed Route does not cross public lands. Consistent with Minn. R. 7850.4300, the Project avoids prohibited routes, including state or national wilderness areas; state or national parks; and state scientific and natural areas.

6.4.8.2. Mitigation Measures

The Proposed Alignment avoids established recreational resources. Negative impacts to recreation are not anticipated; therefore, no mitigation is proposed.

6.4.8.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures related to trail crossings, traffic management, vegetation screening, water resources, avian protection, restoration, and cleanup that also avoid and minimize impacts to recreation resources.

6.4.9. **Socioeconomics**

The Project is in a rural area of Meeker and Stearns counties near Watkins and Kimball. It is generally located away from major population centers.

6.4.9.1. Population and Economic Profile

Table 18 provides information about total population, percent minority population, median household income, and percent of persons in poverty. The median household income is approximately \$17,000 higher across Minnesota than in Meeker County; however, fewer people live in poverty in Meeker County than Minnesota as a whole. The median household income in Stearns County is approximately \$12,000 lower than the median household income across

Minnesota. Additionally, a higher percentage of its population live in poverty compared to Minnesota as a whole.

Table 18 Population and Economic Profile³⁴

Location	2020 Census Population	Percent Minority Population	Median Household Income	Persons in Poverty
Minnesota	5,706,494	24.1%	\$89,062	9.3%
Meeker County	23,400	7.8%	\$72,446	9.1%
Stearns County	158,292	19.8%	\$77,066	12.9%
^a “Minority” refers to people who reported their ethnicity and race as something other than non-Hispanic White.				

6.4.9.2. Local Economy and Labor Force

Meeker County is part of Economic Development Region 6E as defined by the Minnesota Department of Employment and Economic Development (DEED).³⁵ Region 6E includes Kandiyohi, McLeod, Meeker, and Renville counties. Stearns County is part of Economic Development Region 7W as defined by DEED.³⁶ Region 7W includes Benton, Sherburne, Stearns, and Wright counties. The Applicants reviewed the 2024 Regional Profile for Regions 6E and 7W developed by DEED. These profiles provide post-pandemic economic development data. Region 6E and 7W comprise approximately 2 percent and 7.9 percent of the state’s total population, respectively. Region 6E had a small population decrease since 2020. Meeker County is the 43rd largest county in the state and is the fastest growing county in Region 6E. Region 7W has had a 4 percent population increase since 2020, making it the fastest growing of all 13 economic development regions in Minnesota. Stearns County is the 8th largest county in the state.

In 2020, the labor force in Region 6E was approximately 66,080 workers. They lost just under 1,800 workers by 2021 as a result of the pandemic. The 2022 labor force stayed virtually the same as 2021. In 2023, there was a slight increase again, gaining about 500 workers. In 2020, the labor force in Region 7W was approximately 244,527 workers. By 2021, the region had lost approximately 6,500 workers. 2022 and 2023 saw rebounds totaling approximately 4,800 workers in those two years. Region 7W still is not up to pre-pandemic numbers, however, taking into account recent trends, they are projected to surpass the 2020 labor force in the coming years.

The top three industries are the same in Stearns County, Meeker County, and the state of Minnesota. In Stearns County and Meeker County, approximately 28.8 percent and 22.0 percent of the jobs, respectively, are associated with educational services, and health care and social assistance. The other top industries associated with Stearns County and Meeker County are

³⁴ U.S. Census Bureau. 2024. American Community Survey 5-Year Estimates (Tables: B03002 Hispanic or Latino Origin by Race; DP03 Selected Economic Characteristics);³⁴ 2020 Decennial Census (Table P1 Total Population).

³⁵ Minnesota Department of Employment and Economic Development. 2024. *Economic Development Region 6E: Southwest Central, 2024 Regional Profile*. Available at: https://mn.gov/deed/assets/2024_EDR6E_RP_tcm1045-133245.pdf. Accessed March 2026.

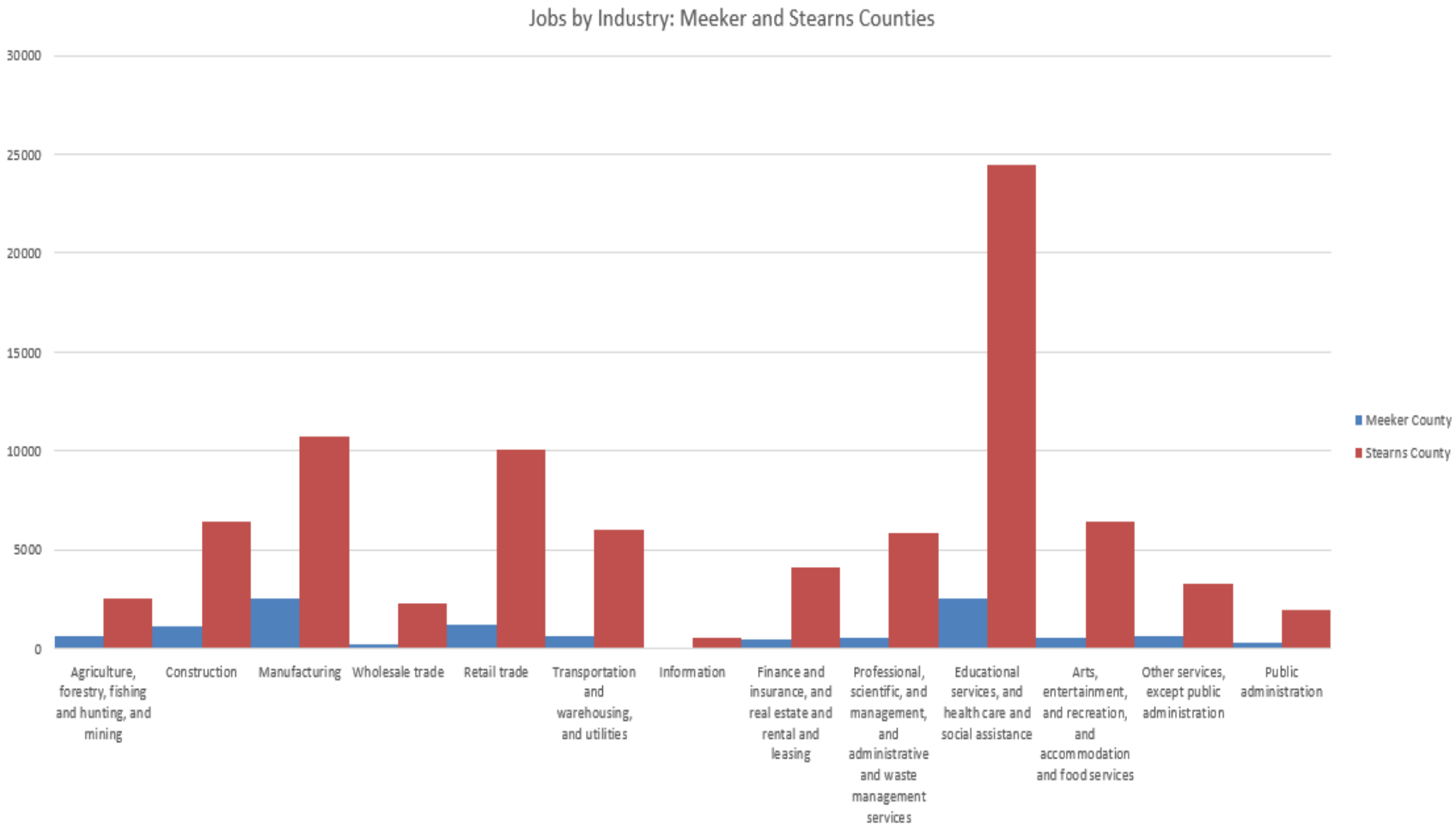
³⁶ Minnesota Department of Employment and Economic Development. 2024. *Economic Development Region 7W: Central, 2024 Regional Profile*. Available at: https://mn.gov/deed/assets/2024_EDR7W_RP_tcm1045-133247.pdf. Accessed March 2026.

manufacturing with 12.6 percent and 21.7 percent, respectively, and retail trade with 11.8 percent and 10.6 percent, respectively. The top three industries in the state of Minnesota are educational services, and health care and social assistance with 25.8 percent, manufacturing with 13.3 percent, and retail trade with 10.7 percent.³⁷

The Applicants used American Community Survey 5-Year Estimates data to develop **Figure 13**, which shows employment by industry in Meeker and Stearns counties for 2024.

³⁷ U.S. Census Bureau. 2024. *American Community Survey. Selected Economic Characteristics in the United States, Table DP03*. Available at: https://data.census.gov/table/ACSDP5Y2024.DP03?q=DP03&g=040XX00US27_050XX00US27093,27145_1400000US27093560200,27145011201. Accessed March 2026.

Figure 13: Jobs by Industry in Meeker and Stearns Counties, 2024



6.4.9.3. Potential Impacts

The ROI for Socioeconomics is Stearns and Meeker counties. Potential impacts are expected to be positive but minimal. Impacts will be short and long term and of a small size.

During construction, there might be short-term positive impacts to the nearby communities. Potential increases in local revenue could occur for businesses, such as hotels, grocery stores, gas stations, and restaurants to support utility personnel and contractors. Some materials might be purchased locally, such as concrete. Landowners will receive one-time payments for new transmission line easements. Meeker Energy will purchase the substation property.

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.

6.4.9.4. Mitigation Measures

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 (i.e., Minnesota and Wisconsin) or in states where Great River Energy has a physical location (i.e., North Dakota). As negative impacts to socioeconomics are not anticipated, no additional mitigation is proposed.

6.4.9.5. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions related to socioeconomics, including filing quarterly labor statistics reports and paying no less than the prevailing wage rate.

6.4.10. Property Values

Impacts on property values that result from power line construction have been studied, focusing primarily on residential, agricultural, and undeveloped properties as opposed to commercial or industrial properties. While the research demonstrates that property value impacts vary, the majority indicate that HVTL have “no significant impact or a slight negative impact on residential properties.”³⁸

The impact on property values from the presence of an HVTL is influenced by a complex interaction of factors. Most of these factors are parcel-specific: condition, size, improvements, acreage, and neighborhood characteristics; the proximity to schools, parks, and other amenities; and the presence of existing infrastructure (e.g., highways, railways, power lines). In addition to property-specific factors, local and national market trends, as well as interest rates can affect all three measures. Thus, impacts from HVTLs on property values depend upon “many factors,

³⁸ Pitts, J. and Jackson, T. 2007. *Power Lines and Property Values Revisited*. The Appraisal Journal, 75(4):323-325. https://www.researchgate.net/publication/316674821_Power_Lines_and_Property_Values_Revisited. Accessed May 2026.

including market condition, location, and personal preference.”³⁹ The presence of a HVTL becomes one of many interacting factors that could affect a specific property value.

Generally, impacts to property values resulting from the existence of an HVTL are based on individual perceptions relating to “aesthetic concerns about the effect of overhead wires and supporting towers on views [and] concerns about the possible adverse health impacts associated with exposure to [EMFs].”⁴⁰ The use and size of a property also influence potential impacts. Properties used exclusively for residential purposes “are more vulnerable to value impact than agricultural or recreational uses, where a broader set of property attributes become relevant for the purchaser.”⁴¹ Smaller properties are more vulnerable to value impacts “due to decreased flexibility in the siting of improvements,” though, due to topography, access, and related constraints, this can also apply to larger sized parcels.⁴²

The use of multiple regression statistical analysis is generally accepted as the current professional and academic standard for evaluating potential property value impacts, as it reflects the actual behavior of property buyers and sellers in terms of recorded sales prices, while controlling for other factors, for example, home size.^{43, 44} The results are often reported as an average change over a number of properties; however, the effect on individual properties can vary (i.e., increase or decrease) widely.

The results of these studies can be summarized, generally, as follows:

- Over time, there is a consistent pattern with about half of the studies finding negative property value effects and half finding none.
- When effects have been found, they tend to be small; almost always less than 10 percent and usually in the range of 3 percent to 6 percent.
- Where effects are found, they decay rapidly as distance to the lines increases and usually disappear at about 200 feet to 300 feet.
- Two studies investigating the behavior of the effect over time find that, where there are effects, they tended to dissipate over time.⁴⁵

³⁹ *Ibid.*

⁴⁰ Roddewig, R. and Brigden, C. 2014. *Power Lines and Property Prices*. Real Estate Issues, 39(2):15-33. <https://cre.org/wp-content/uploads/2014/10/Real-Estate-Issues-Power-Lines-and-Property-Prices.pdf>.

⁴¹ Chalmers, J. 2012. *Transmission Line Impacts on Rural Property Value*. Rights of Way. May/June.

⁴² *Ibid.*

⁴³ Kinnard, W. and Dickey, SA. 1995. *A Primer on Proximity Impact Research: Residential Values Near High Voltage Transmission Lines*. Available at: <https://cre.org/wp-content/uploads/1995/04/Real-Estate-Issues-April-1995-4.pdf>. Accessed October 2025.

⁴⁴ Minnesota Department of Commerce. 2025a. *Environmental Assessment: Laketown 115 kV Transmission Line Project*. Available at: <https://puc.eip.mn.gov/sites/default/files/2025-05/Laketown%20115%20kV%20Transm%20Line%20Project%20Environmental%20Assessment.pdf>. Accessed June 2026.

⁴⁵ *Ibid.*

6.4.10.1. Potential Impacts

The ROI for property values is the Local Vicinity. Impacts to property values could occur; however, specific changes to a property's value are difficult to predict. Impacts, if they occur, are expected to decay over time. Property value impacts fall off rapidly with distance; therefore, impacts are anticipated to be localized. Long-term impacts might or might not occur.

Every landowner has a unique relationship and sense of value associated with their property. Thus, a landowner's assessment of potential impacts to their property's value is often a deeply personal comparison of the property "before" and "after" a proposed project is constructed. These judgements, however, do not necessarily influence the market value of a property. Rather, appraisers assess a property's value by looking at the property "after" a project is constructed. Moreover, potential market participants likely see the property independent of the changes brought about by a project; therefore, they do not take the "before" and "after" into account the same way a current landowner might.

6.4.10.2. Mitigation Measures

Impacts on property values can be mitigated by reducing aesthetic impacts and encumbrances to future land use. Collocating the transmission line with existing infrastructure helps to reduce aesthetic impacts and potential land use conflicts, and landowners will be compensated for any easements. Here, the Proposed Route follows existing road right-of-way for the entirety of its length, and existing distribution for most of its length. The Applicants do not propose additional mitigative measures specific to property values.

6.4.10.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures that may serve to minimize impacts to property values. For example, permittees are required to restore or compensate landowners for damages due to construction, consider landowner input when placing structures, and preserve the natural landscape to the extent possible.

6.5. Public Health and Safety

The Project will be designed in compliance with local, state, NESC, and Great River Energy and Meeker Energy standards regarding clearance to the ground, clearance to crossing utilities, strength of materials, and ROW widths. Construction and contract crews will comply with local, state, and NESC standards regarding installation of facilities and standard construction practices. Great River Energy and Meeker Energy will follow established safety procedures, as well as industry safety procedures, during and after installation of the Project, including clear signage during all construction activities. See **Section 5.1.4** and **Section 5.2.3** for discussions on construction practices and safety.

6.5.1. Interference

As discussed in **Section 6.4.6**, the "corona" effect can ionize surrounding air molecules. Corona can transform discharged energy into very small amounts of radio noise. Corona-induced 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. In addition, structures could block line-of-sight communication signals. Interference from the Kimball Substation is not expected.

6.5.1.1. Potential Impacts

The likelihood of radio and television interference from the Project is minimal because the likelihood of significant corona formation on the Project is 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.

Should interference occur, it would most likely be in the AM frequency range and occur underneath the conductors or very close to them within the Proposed ROW. Interference is not expected at higher frequencies including FM radio and the Allied Radio Matrix for Emergency Response (ARMER) system (see **Section 6.5.3**).

6.5.1.2. Mitigation Measures

The ROI for interference is the Proposed Route. Because the Applicants do not expect radio and television interference to be an issue, the Applicants do not propose additional mitigative measures specific to interference.

6.5.1.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions that require the permittee to act if interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems, or other communication devices is caused by the presence or operation of the Project. Permittees must restore or provide reception equivalent to reception levels in the immediate area just prior to construction of the Project.

6.5.2. Electric and Magnetic Fields

As it pertains to the Project, the term “EMF” refers to the extremely low frequency decoupled EF and magnetic fields (MF) 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 MF is related to the magnitude of the current flow through the conductor. EMF is a naturally occurring phenomenon. It is also found in association with transmission lines, local distribution lines, substation transformers, household electrical wiring, and common household appliances.

6.5.2.1. 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 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.

When an EF reaches a nearby conductive object, such as a vehicle or a metal fence, it can induce a voltage on the object (or, “induced voltage”). 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.

Neutral-to-earth voltage or “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.

Although there is no state or federal standard for transmission line EF exposures, the Minnesota Environmental Quality Board (EQB) developed a standard of a maximum EF limit of 8 kV/m at one meter (3.28 feet) above ground; the Commission has adopted this standard.

6.5.2.2. Magnetic Fields

Current passing through any conductor, including a wire, produces an MF in the area around the wire. The current flowing through the conductors of a transmission line generates a MF that, in similar fashion to the EF, extends outward from the energized conductors. The intensity of the MF associated with a transmission line is proportional to the amount of current flowing through the line’s conductors, and the magnitude of the MF rapidly decreases with the distance from the conductors. Unlike EF, MFs are not significantly affected by the presence of trees, buildings, or other solid structures nearby. The value of the MF 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.^{46,47} The general standard is one of prudent avoidance. MF levels associated with some common electric appliances are provided in **Table 19**.

Table 19 Magnetic Fields of Common Electric Appliances (mG)⁴⁸

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

Implantable Medical Devices

High intensity EMFs can have adverse impacts on the operation of implantable medical devices such as pacemakers and defibrillators. While research has shown that the MFs associated with HVTs do not reach levels at which they could cause interference with such devices, it is possible that the EFs associated with some HVTs 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 implantable medical devices have indicated that EFs below 6 kV/m are unlikely to cause interactions affecting the operation of most of their devices.

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 implantable medical devices 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,

⁴⁶ Minnesota State Interagency Working Group on EMF Issues. 2002. *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*. Available at: <https://apps.commerce.state.mn.us/cera/web/project-file?legacyPath=/opt/documents/EMF%20White%20Paper%20-%20MN%20Workgroup%20Sep%202002.pdf>. Accessed October 2025.

⁴⁷ National Research Council Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems. 1997. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*. National Academies Press. Available at: <https://pubmed.ncbi.nlm.nih.gov/25121270/>. Accessed October 2025.

⁴⁸ U.S. Environmental Protection Agency. 1992. *EMF in Your Environment. Magnetic Field Measurements of Everyday Electrical Devices*. Available at: <https://nepis.epa.gov/Exe/tiff2png.cgi/000005EP.PNG?-r+75+-g+7+D%3A%5CZYFILES%5CINDEX%20DATA%5C91THRU94%5CTIFF%5C00000191%5C000005EP.TIF>. Accessed October 2025.

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 implantable medical devices. The analysis concluded that although interference may be possible in unique situations, device interference because of typical public exposure would be rare.⁴⁹

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.

6.5.2.3. Potential Impacts

The ROI for EMF is the Proposed ROW. Considerable research has been conducted since the 1970s to determine whether exposure to power-frequency, commonly referred to as “extremely low frequency” (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 extremely low frequency MF exposure and health risks and no association between extremely low frequency 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.⁵⁰ Other studies have come to similar decisions.^{51,52}

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.” This conclusion was further justified in the Route Permit proceedings for the Brookings Project. In the Brookings Project Route Permit proceedings, Great River Energy/Xcel Energy and one of the intervening parties both provided expert evidence on the potential impacts of extremely low frequency EFs and extremely low frequency MFs,

⁴⁹ Minnesota Power Systems Conference Proceedings (University of Minnesota). 2007. *Electromagnetic Compatibility of Active Implantable Medical Devices (AIMD), and their Interaction with High Voltage Power Lines*, at 23.

⁵⁰ National Institute of Environmental Health Sciences. 2025. *Electric & Magnetic Fields*. Available at: <http://www.niehs.nih.gov/health/topics/agents/emf/>. Accessed October 2025.

⁵¹ Minnesota State Interagency Working Group on EMF Issues. 2002. *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*. Available at: <https://apps.commerce.state.mn.us/cera/web/project-file?legacyPath=/opt/documents/EMF%20White%20Paper%20-%20MN%20Workgroup%20Sep%202002.pdf>. Accessed October 2025.

⁵² World Health Organization. 2007. *Extremely Low Frequency Fields. Environmental Health Criteria Monograph No. 238*. Available at: <https://www.who.int/publications/i/item/9789241572385>. Accessed May 2026.

including the World Health Organization findings.⁵³ 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 [electric fields and magnetic fields] exposure.” The Commission adopted this finding on July 15, 2010.⁵⁴ Impacts to public health and safety are not anticipated. Impact calculations prepared by the Applicants for electric and magnetic fields are included below.

Electric Fields

Great River Energy has calculated the approximate EFs for the Project’s transmission configuration and estimates the peak magnitude of EFs density to be approximately 0.84 kV/m underneath the conductors (one meter above ground), which is well below the Commission's standard. **Table 20** summarizes the EFs calculated for the proposed transmission line. These EF calculations are also shown graphically on **Figure 14**.

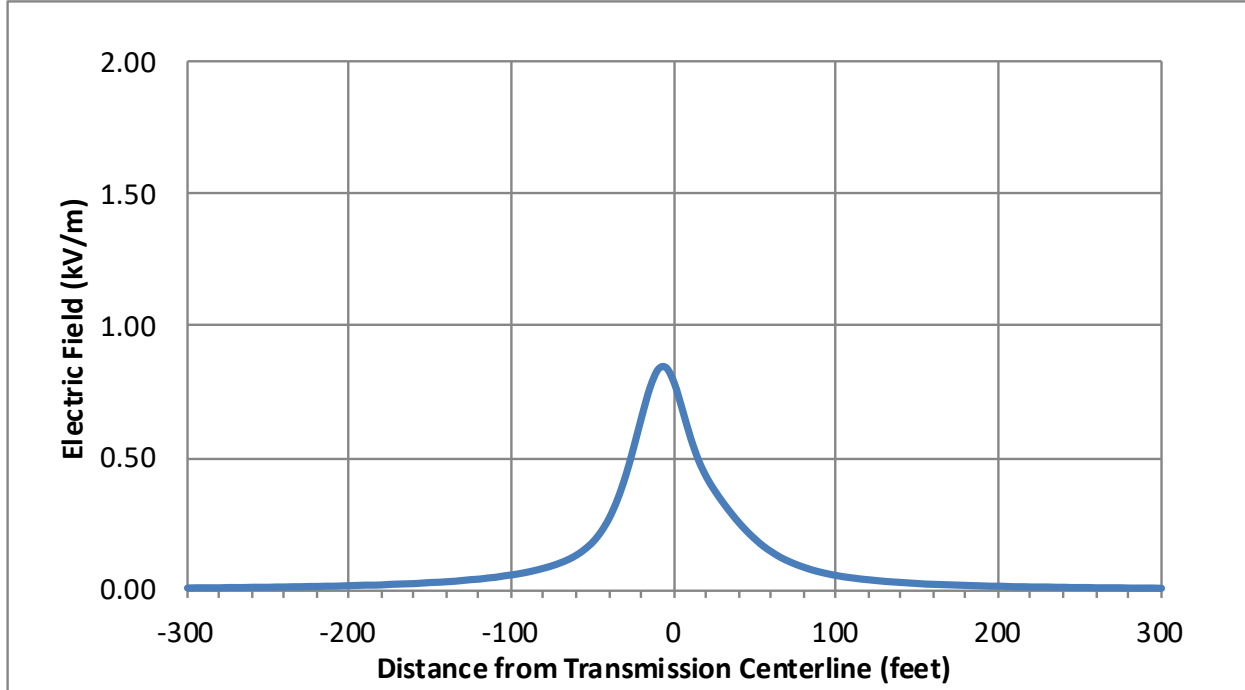
Table 20 Calculated Electric Fields (kV/M) at One Meter Above Ground

Design Voltage (kV)	Max Operating Voltage (kV)	Distance from Transmission Line (feet)										
		-300	-200	-100	-50	-25	Max (-5)	25	50	100	200	300
115-kV	126.5	0.01	0.02	0.06	0.18	0.54	0.84	0.37	0.19	0.05	0.01	0.01

⁵³ *Ibid.*

⁵⁴ Minnesota Public Utilities Commission. 2010. *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*. Available at: <https://puc.eip.mn.gov/sites/default/files/2024-01/pdfs/d3de4cba-c74e-4d74-bf9d-7611874eb8fa.pdf>. Accessed May 2026.

Figure 14 Calculated Electric Field Profile



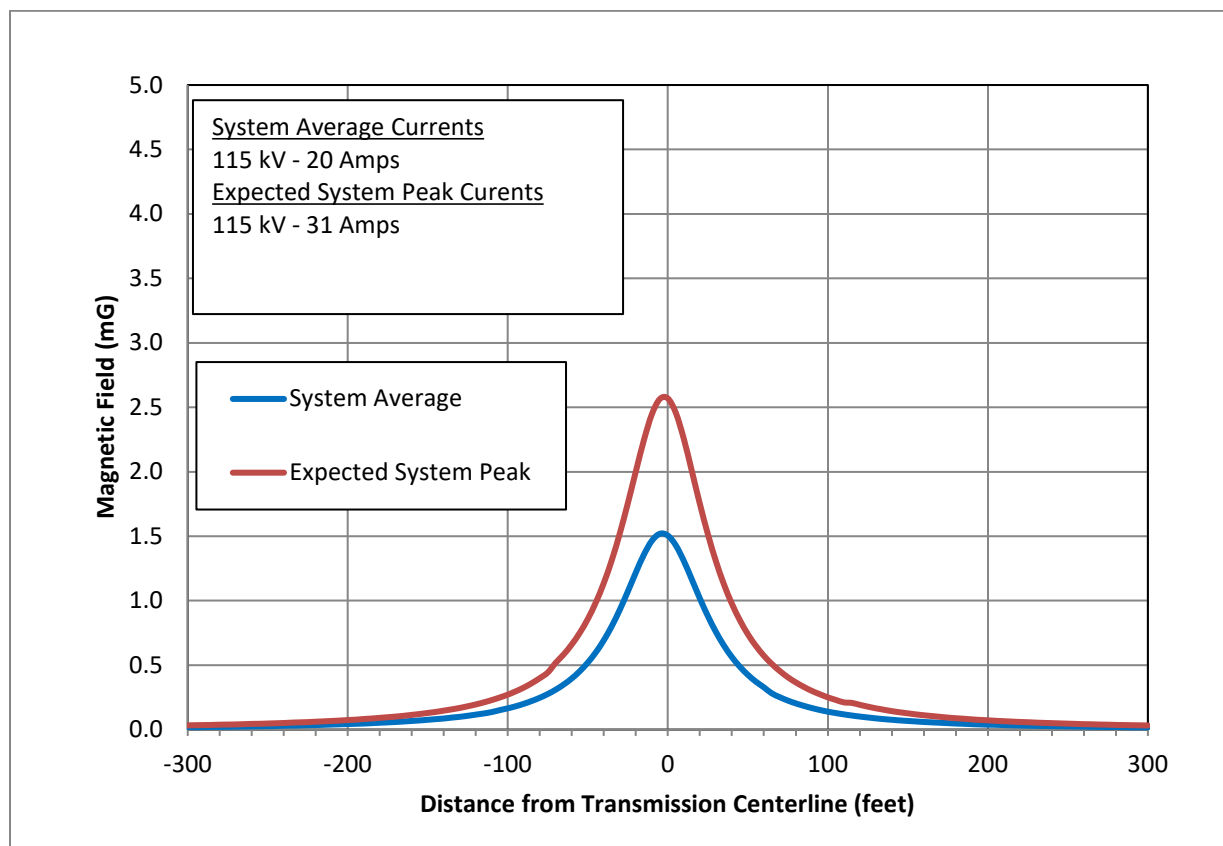
Magnetic Fields

Table 21 summarizes the MFs calculated for the proposed transmission line configuration with power flow at peak loading and at average loading. The MF calculations are also shown graphically on **Figure 15**.

Table 21 Calculated Magnetic Fields (mG) for Proposed Design

Operating Voltage	Line Current (Amps)	Distance from Transmission Line (feet)										
		-300	-200	-100	-50	-25	Max (0)	25	50	100	200	300
115-kV Average Load	20.1	0.02	0.04	0.17	0.52	1.07	1.51	0.88	0.43	0.14	0.04	0.02
115-kV Peak Load	30.1	0.03	0.07	0.27	0.86	1.76	2.57	1.52	0.74	0.25	0.07	0.03

Figure 15 Calculated Magnetic Field Profile



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

Implantable Medical Devices

Manufacturers of pacemakers and other implantable medical devices have indicated that EFs below 6 kV/m are unlikely to cause interactions affecting the operation of most of their devices. **Table 20** and **Figure 14** show that the EFs for the Project are below levels at which modern bipolar devices are susceptible to interaction with the fields.

6.5.2.4. Mitigation Measures

The Project will be designed in compliance with local, state, NESC, and Great River Energy and Meeker Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths. The Kimball Substation will be equipped with protective breakers and relays. Protective equipment is designed to de-energize the transmission line when needed. The Kimball Substation will be protected by locked gates and barbed-wire-topped fencing. Signage attached to the fence will list the owner, provide a telephone contact number, and warn about electrical hazards within the substation.

Great River Energy and Meeker Energy will ensure that safety requirements are met during the construction and operation of the facilities. Additionally, when crossing roads or railroads during stringing operations, guard structures will be used to eliminate traffic delays to the extent practicable and provide safeguards for the public.

Great River Energy will work with landowners regarding induced current concerns. If a landowner has stray voltage concerns on their property, Great River Energy will suggest they contact their electric service provider to discuss the situation with technical staff, including the possibility of an on-site investigation.

6.5.2.5. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures relevant to electric and magnetic fields, including a requirement that permittees design transmission lines to meet or exceed all relevant requirements, and that permittees design, construct, and operate the transmission line such that the electric field measured one meter above ground level immediately below the transmission does not exceed 8 kV/m. Route permits also typically contain the measures relevant to stray and induced voltage. For example, permittees are required to address any induced current issues that arise because of the line's operation. Typical site permits also include requirements related to grounding certain objects within the right-of-way.

6.5.3. Emergency Services

Emergency services are provided by a variety of entities in Stearns and Meeker counties.

The Stearns County Sheriff's Office, Kimball Police Department, and Watkins Police Department provide police services for the Project Area.

The Watkins Fire Department provides fire services to Watkins, Luxembourg, and Maine Prairie Townships in Stearns County and Forest Prairie Township in Meeker County.⁵⁵ The Kimball Fire Department also serves multiple towns in the area, including Kimball, Fairhaven, Kingston, and Maine Prairie.⁵⁶

The Watkins Ambulance and Rescue Squad is staffed by volunteer, trained Emergency Medical Technicians who are always on call. They provide ambulance and emergency medical services (EMS) to Watkins, Eden Valley, and Kimball. They also cover all or parts of Manannah, Forest Prairie, and Kingston Townships in Meeker County and Eden Lake, Luxemburg, Maine Prairie, and Fairhaven townships in Stearns County.⁵⁷

⁵⁵ City of Watkins. 2026. *Fire Department*. Available at: <http://www.cityofwatkins.com/fire-department.html>. Accessed March 2026.

⁵⁶ City of Kimball. 2026. *Fire Department*. Available at: <https://www.ci.kimball.mn.us/fire>. Accessed March 2026.

⁵⁷ City of Watkins. 2026. *Watkins Ambulance Service*. Available at: <http://www.cityofwatkins.com/ambulance.html>. Accessed March 2026.

The CentraCare Paynesville Hospital is the closest emergency room to the Project. Meeker Memorial Hospital in Litchfield and St. Cloud Hospital in St. Cloud also both house emergency rooms.

The ARMER system is a radio communication system that is used by first responders across Minnesota. The ARMER system is Minnesota's primary two-way safety radio system. It serves all state agencies, fire, EMS, police, and local governments. The system was developed to improve communication amongst emergency service providers during natural and man-made disasters and is managed by MnDOT.⁵⁸

6.5.3.1. Potential Impacts

The ROI for Emergency Services is Stearns and Meeker counties. Construction of the Project is expected to have short-term, minimal impacts on emergency services. Operational impacts are anticipated to be negligible.

Construction of the Project could impact emergency services during construction by requiring emergency services to respond to any incidents or by interfering with the ability of emergency responders to respond to an emergency. Great River Energy and Meeker Energy will prioritize emergency response over construction to allow emergency services to access construction work areas. As such, construction of the Project is not expected to affect emergency services.

The ARMER system is used across Minnesota. Broadcast frequencies are above 700 megahertz. As discussed in **Section 6.5.1**, radio frequency noise would be outside this range; therefore, the ARMER system will not be impacted. ARMER towers vary in height but are generally over 330 feet tall. As such, the Project will not cause line-of-sight concerns.⁵⁹

There will be up to 27 workers on site at any given time. Local emergency services will respond to any accidents. CentraCare Paynesville Hospital, Meeker County Hospital, and St. Cloud Hospital all have ambulance services. CentraCare Paynesville Hospital is 36-bed, Level 4 Trauma Center with a helipad.⁶⁰

6.5.3.2. Mitigation Measures

Because the Applicants anticipate that impacts to emergency services will be negligible, no mitigation is proposed.

⁵⁸ Minnesota Department of Public Safety. 2026. *Emergency Communications Networks – Allied Radio Matrix for Emergency Response (ARMER)*. Available at: <https://dps.mn.gov/node/622>. Accessed March 2026.

⁵⁹ Robert Kimball & Associates. 2008. *Allied Radio Matrix for Emergency Response (ARMER) Phases 4-5-6 Cost Audit Report submitted to the Department of Public Safety State of Minnesota*. Available at: <https://www.lrl.mn.gov/docs/2009/mandated/090123.pdf>. Accessed March 2026.

⁶⁰ CentraCare. 2026. *CentraCare – Paynesville Hospital*. Available at: <https://www.centracare.com/locations/profile/paynesville-hospital/>. Accessed March 2026.

6.5.3.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures that address emergency services, including a requirement that permittees minimize disruption to public services.

6.5.4. **Public and Worker Safety**

Construction and operation of the Project involves risks to the public and workers. Public risks are associated with electrocution. Electrocution risks are associated with unauthorized entry to a substation. Electrocution can also occur if a person or equipment, such as large machinery, gets too close to an overhead transmission line. Contact with a downed power line also poses a risk; these risks are most associated with distribution lines. Lastly, vehicle collisions with transmission line poles could occur.

The hazards present at a transmission line or substation construction site are similar to those at another large construction site. Generally, safety concerns include electrocution, falls, confined spaces, fires and explosions, sprains, strains, fractures, and environmental stress.⁶¹ Transportation-related accidents are also a significant risk for all industries.

6.5.4.1. Potential Impacts

The ROI for Public and Worker Safety is the Proposed ROW. Potential impacts are anticipated to be short and long term, of a small size, and able to be mitigated. Overall, impacts are expected to be minimal.

There are risks associated with construction and operation of a transmission line. Unauthorized entry to the substation would expose the public to electrocution risks. A potential for electrocution exists should individuals approach the energized lines. Individuals can be exposed to electrocution if they contact the transmission line from the ground whether in machinery or other means. This event is most often associated with distribution lines.

Workers could potentially be injured traveling to and from the construction site, slips and falls, and electrocution, among other common construction worksite risks. Local emergency services will respond to any accidents as discussed in **Section 6.5.3**.

6.5.4.2. Mitigation

Great River Energy and Meeker Energy are committed to meet or exceed the design, construction, and operational requirements of the NESC, North American Electric Reliability Corporation requirements, and state and local codes.

Proper signage will warn the public of electrical dangers. The Applicants or their contractor will provide or require necessary safety equipment, including fall arrest equipment, and provide daily

⁶¹ U.S. Department of Labor Occupational Safety and Health Administration. n.d. *Electric Power Generation, Transmission, And Distribution Industry Hazards*. Available at: <https://www.osha.gov/power-generation/industry-hazards>. Accessed April 2026.

“tailgate” safety trainings. All work will comply with Occupational Safety and Health Administration (OSHA) requirements. Downed transmission lines are deenergized either automatically by breakers or manually by switches and other safety equipment in substations. Should such equipment fail, the potential for electrocution exists if individuals contact the energized lines.

6.5.4.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions and mitigation measures that address public and worker safety. For example, permittees must design transmission lines to meet applicable codes and requirements, coordinate with local road authorities, and train workers and contractors on the requirements of the route permit.

6.6. Land-based Economies

6.6.1. Agriculture

According to the 2022 USDA Census of Agriculture, Stearns County has 2,695 individual farms with an average farm size of 239 acres that covers approximately 643,463 acres of the county. Approximately \$1,021 million was generated from crop and livestock sales in 2022. Meeker County has 991 individual farms with an average farm size of 311 acres that covers approximately 308,376 acres of the county. Approximately \$498 million was generated from crop and livestock sales.

According to National Land Cover Database (NLCD) data, the Proposed Route consists of about 108.4 acres of cultivated cropland and 22.4 acres of pasture/hay lands. Agricultural areas are shown in the detailed route maps provided in **Appendix B**. Two organic farms totaling 365 acres exist in the Project Area (see **Figure 16**). These farms raise barley, corn for feed, hay and straw, as well as dairy cattle, hogs, and poultry for eggs. Organic farming operations will be crossed by the Project.⁶² There are no registered apiaries within 1 mile of the Proposed Route.⁶³

Prime farmland and farmland of statewide importance are discussed in **Section 6.8.6**.

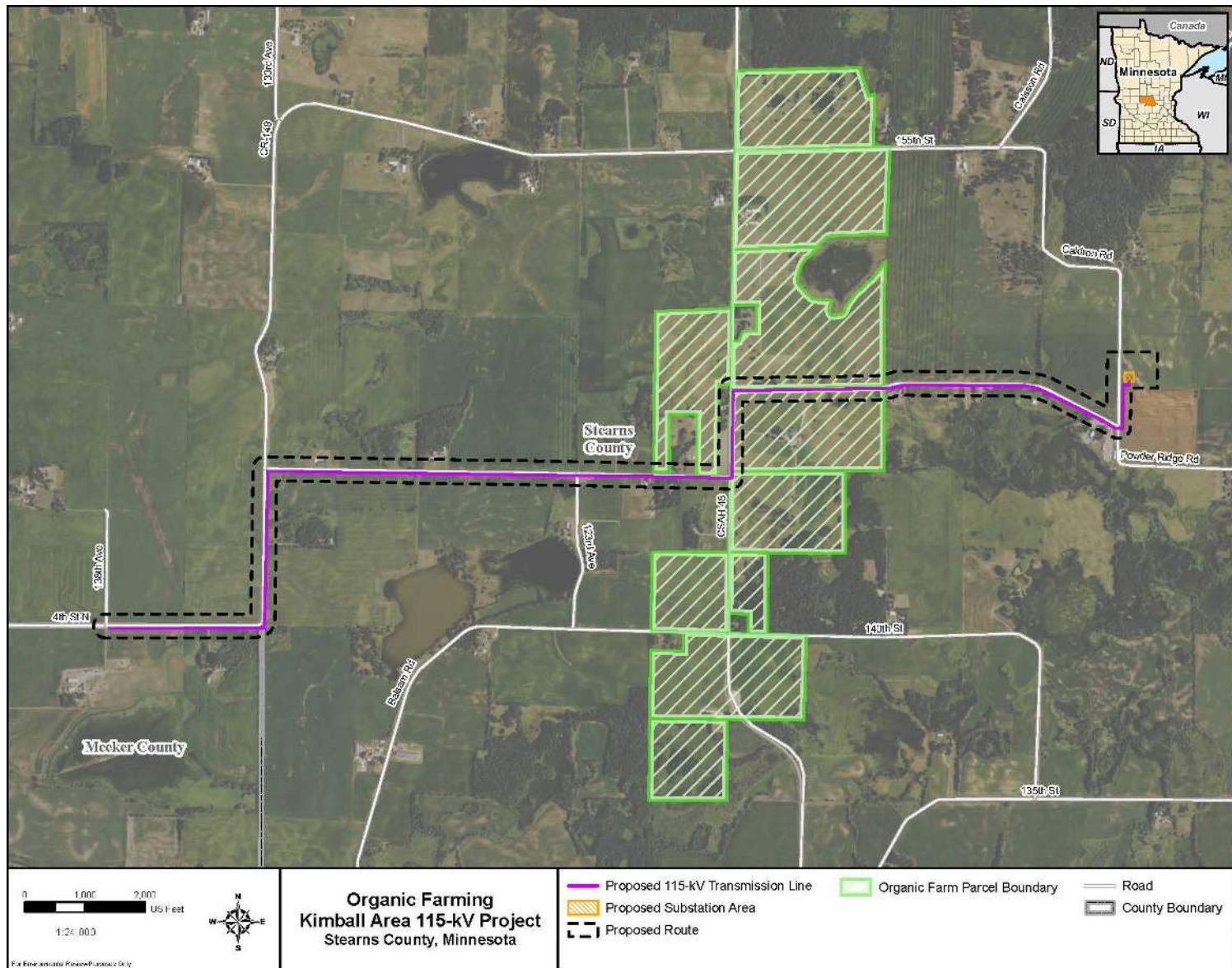
6.6.1.1. Potential Impacts

The ROI for Agriculture is the Proposed Route. Most impacts are anticipated to be short term and minimal. The Kimball Substation will take agricultural land out of production. Impacts to agricultural operations in this area will be permanent. Impacts to organic farm certification could be significant if any pesticides used during right-of-way maintenance activities were to drift onto an organic farm causing revocation of the organic certification.

⁶² Minnesota Department of Agriculture. 2023. *Organic Farm Directory by County*. Available at: <https://www.lrl.mn.gov/docs/2023/other/231687.pdf>. Accessed April 2026.

⁶³ Minnesota Department of Agriculture. 2026. *Minnesota Apiary Registry*. Available at: <https://mn.beecheck.org/map>. Accessed April 2026.

Figure 16 Organic Farming Operations



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. If drain tile is present in the disturbance area, it could be damaged when augering holes for structures. Agricultural land could be taken out of production during construction of the transmission line; however, farming will resume after restoration is complete. Only structure locations (and associated guying, if any) will be precluded from future farming activities. These impacts could cause crop losses.

Great River Energy does not spray pesticides in rights-of-way adjacent to organic farms unless explicitly authorized by the landowner and farmer. As such, Great River Energy will coordinate with organic farmers should it be necessary to maintain the right-of-way with the application of pesticides. If spraying should be necessary within one-half mile of an organic farm, Great River Energy will coordinate with the organic farmer and spray under conditions where pesticide would only drift away from the organic farm. If necessary to treat noxious weeds, Great River Energy generally applies spot applications of pesticides using backpack sprayers.

Pesticide application is not anticipated within one-half mile of an organic farm. Any pesticide application by Great River Energy would result in a negligible potential to impact organic farms given Great River Energy's commitment to coordinate with organic farmers and use only spot spraying to avoid pesticide drift outside the right-of-way. This impact would be incremental to existing farming operations that use pesticides on their fields in the Project Area. Nevertheless, should pesticide drift reach organic farm operations and this drift result in the revocation of an organic certification, these impacts would be significant.

6.6.1.2. Mitigation Measures

Great River Energy prepared an AIMP (**Appendix H**) for the Project and will follow this plan during construction and operation of the Project. Great River Energy will work with landowners to minimize impacts to agricultural activities and will compensate landowners for any crop damage/loss and soil compaction that might occur during construction. Areas disturbed during construction will be repaired and restored to pre-construction conditions as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate crop production or natural revegetation, provide for proper drainage, and prevent erosion. Should spraying be necessary, Great River Energy will coordinate with organic farmers within one-half mile and spot spray during periods of little to no wind and under wind conditions that would result in any drift moving away from the organic farm. Additionally, Great River Energy employs certified pesticide applicators that will apply pesticides following label requirements as required by federal and state law.

Specific mitigation measures Great River Energy will implement include in addition to the standard permit conditions listed above include:

- Placing the transmission line on the edge of property to minimize agricultural interference, when possible.

- Where local roads cannot be used, movement of crews and equipment will be limited to the ROW to the greatest extent possible; this includes access. 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.
- Great River Energy will contact landowners after construction is complete to determine if they are satisfied with clean-up measures and if any other damage might 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.
- Great River Energy or its contractors will repair ruts or provide compensation to the landowner depending upon landowner preferences. Such ruts will be leveled, filled, and graded or otherwise eliminated in an approved manner. In pasture areas, compacted soils will be loosened, and ruts will be leveled by scarifying, harrowing, disking, or by other approved methods. Damage to ditches, terraces, roads, and other land features will be corrected using approved methods and in accordance with the Vegetation Management Plan, as necessary. The land and facilities will be restored as nearly as practicable to their original conditions.
- Great River Energy will restore or provide compensation for crop damage or other property damage that occurs because of construction or maintenance of the Project.
- Fences, gates, and similar improvements that are removed or damaged will be promptly repaired or replaced.
- For temporary storage or laydown yards, which will provide space to store material and equipment and temporary workspace needed for wire stringing and pulling equipment, Great River Energy will work with landowners to lease the space by agreement with the respective owner(s).

An AIMP can be a common mitigation measure for work in agricultural areas; these are developed in coordination with the MDA. Great River Energy will continue to coordinate with MDA regarding preparation of an AIMP.

6.6.1.3. Typical Route Permit Conditions

- Route permits issued by the Commission typically contain the avoidance and minimization measures relevant to agriculture. For example, route permits typically require permittees to repair or replace drain tile damaged by a project, restore or compensate landowners for damages due to construction, and restore the right-of-way after construction is complete. Route permits also typically include requirements related to the applicable of pesticides and herbicides, organic farms, and avoiding the spread of noxious weeds.

6.6.2. Forestry

While tree clearing will occur, there are no forested areas within the Proposed Route. Commercial forestry operations do not exist along the Proposed ROW.

6.6.2.1. Potential Impacts

The ROI for Forestry is the Proposed Route. Impacts to commercial forestry operations will not occur.

6.6.2.2. Mitigation Measures

The Project will not result in impacts on commercial forestry operations; therefore, no mitigation is proposed.

6.6.2.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include requirements relevant to forestry, including requirements related to tree removal, restoration, and avoiding and minimizing the introduction of noxious weeds and invasive species..

6.6.3. Mining

There are no mapped MDNR-identified gravel pits within the Proposed Route.⁶⁴ Additionally, there are no MDNR active mineral leases within the Proposed Route.⁶⁵

6.6.3.1. Potential Impacts

The ROI for Mining is the Proposed Route. Desktop review of aerial imagery confirms that no mining operations exist within the Proposed Route. Impacts to mining will not occur.

6.6.3.2. Mitigation

The Project will not result in impacts on mining; therefore, no mitigation is proposed.

6.6.3.3. Typical Route Permit Conditions

Route permits issued by the Commission do not typically include provisions specific to mining. However, general requirements related to landowner coordination, notification, and restoration would also minimize impacts to mining resources.

⁶⁴ Minnesota Department of Transportation. 2026. *Materials and Road Research. Aggregate Source Information System*. Available at: <https://www.dot.state.mn.us/materials/aggsources.html>. Accessed April 2026.

⁶⁵ Minnesota Geospatial Commons. 2026. *State Mineral Leases*. Available at: <https://gis.data.mn.gov/maps/0d9e0d712c124755933408980351f797>. Accessed April 2026.

6.6.4. Tourism

Tourism is related to activities that bring visitors to the Local Vicinity in a way that results in outside revenue being generated for the local economy. Tourism associated with outdoor recreational opportunities is most associated with publicly accessible lands and waters. Recreational opportunities are discussed in **Section 6.4.8**. Tourism is also associated with community and regional events, such as fairs and other events.

6.6.4.1. Potential Impacts

The ROI for Tourism is the Local Vicinity. The Alice Hamm WMA is within the Local Vicinity. As discussed in Section 6.4.8, impacts are anticipated to be negligible on this WMA. There are no other public lands within the Local Vicinity. Community or regional events are not held in the Local Vicinity. As such, potential impacts are not expected to occur.

6.6.4.2. Mitigation

The Project will not result in impacts on tourism; therefore, no mitigation is proposed.

6.6.4.3. Typical Route Permit Conditions

Typical route permits include conditions related to scenic, recreation, transportation, and public access resources and values. These requirements would also be expected to avoid and minimize indirect impacts on tourism.

6.7. Archaeological and Historic Resources

Merjent, Inc. (Merjent) conducted a cultural resource literature review of a 0.5-mile-wide buffer centered on the Proposed Alignment referred to in this section as the Study Area. This literature review and Merjent's evaluation of the possible effects of the proposed Project on historic properties in the Study Area was provided to the Minnesota SHPO in a letter dated May 29, 2026 (**Appendix D**). SHPO responded on June 26, 2026. The following summarizes the results of the literature review and SHPO's response.

On March 25, 2026, Merjent retrieved previous survey reports on file from SHPO and on March 17, 2026, Merjent retrieved cultural resources site information (i.e., archaeological sites and historic structures). 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.⁶⁶ Merjent reviewed records within the Study Area. According to the OSA and SHPO files, no previously conducted archaeological surveys were recorded within the Study Area.

There are no previously recorded archaeological sites or historic buildings and structures located within the Study Area. One potential historic cemetery is located within the Study Area. Old St. Annes Cemetery is located southeast of the intersection of 140th Street and County Road 149. The

⁶⁶ Minnesota Department of Administration State Archaeologist. 2025. *Office of the State Archaeologist Portal*. Available at: <https://osaportal.gisdata.mn.gov/>. Accessed June 2026.

historic boundary does not overlap but is located immediately adjacent to the Route Width. The precise location of the historic Old St. Annes Cemetery or a modern counterpart of the historic cemetery was not identified during review of historic aerials, historic atlases, or topographic maps; however, according to OSA records, most of the burials associated with this cemetery have been moved.

Merjent reviewed nineteenth century GLO maps and notes on file with the Bureau of Land Management (BLM).⁶⁷ The GLO map of the Study Area illustrated conditions in 1870 as being prairie, with several lakes and/or wetlands and connecting streams and rivers. No historic features were identified within the Study Area. Aerial photographs from 1939, 1963, and the present all show that the current road system and farms have been established, with agricultural fields dominating the landscape. Subsequent historic and modern aerial photographs following 1963 show that the landscape of the Study Area has remained largely unchanged.

Great River Energy requested feedback on the Project from the 11 federally recognized Tribes with geography within Minnesota, the 1854 Treaty Authority, and MIAC. To date, three Tribes have responded. The Mille Lacs Band of Ojibwe acknowledged that they have received the Project information and will review it. The Shakopee Mdewakanton Sioux Community indicated there are no significant cultural resources in the Proposed Route. The Leech Lake Band of Ojibwe does not have any recorded specific historic properties within the Project Area. (**Appendix E.**)

6.7.1. Potential Impacts

The ROI for Archaeological and Historic Resources is the Project Area. No archaeological sites, no historic structures, and one potential historic cemetery were identified within the Study Area. The historic cemetery does not overlap the Project Area according to the boundary provided by the OSA.

There is potential for precontact and historic-period sites within the Project Area; however, given that the Project is proposed within already disturbed ROW, there is a low potential for intact archaeological sites in the areas of ground disturbance associated with this Project.

6.7.2. Mitigation Measures

SHPO provided comments in response to the Applicants' Phase 1A Cultural Resources Assessment. SHPO agreed "that the assessment is accurate, there are no known archaeological sites within the proposed project boundary, nor are there any historic properties designated in Minnesota Statute 138.665." Further, SHPO indicated that in the Applicants' assessment, "you recommend a Phase I archaeological survey of the new transmission line pole locations and the substation location ahead of Project construction. We agree with this recommendation." (**Appendix D**)

Great River Energy will prepare an Unanticipated Discoveries Plan prior to construction of the Project. If any archaeological sites are identified during construction, work will be stopped and SHPO staff consulted as to how to proceed. If human remains are encountered during construction

⁶⁷ U.S. Department of the Interior Bureau of Land Management. 2025. *The Official Federal Land Records Site*. Available at: <https://glorerecords.blm.gov/>. Accessed June 2026.

activities, all ground disturbing activity will cease, and local law enforcement will be notified per Minn. Stat. § 307.08.

6.7.3. Typical Route Permit Conditions

Route permits issued by the Commission typically contain avoidance and minimization measures relevant to archaeological and historic resources, including a requirement that permittees make efforts to avoid impacts to such resources and, when a resource is encountered, that permittees consult with SHPO and the State Archaeologist. Permittees are also typically required to train workers about the importance of avoiding cultural properties.

6.8. Natural Environment

6.8.1. Air Quality

The Clean Air Act (42 United States Code 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 (O₃), nitrogen dioxide (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 (PM_{2.5}), and O₃. 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. Stearns and Meeker counties are in attainment with all NAAQS.⁶⁸

In Minnesota, air quality is tracked using air quality monitoring stations across the State. The MPCA uses data from these monitors to calculate the Air Quality Index (AQI), on an hourly basis, for O₃, PM_{2.5}, SO₂, NO₂, and CO to communicate with the public about the quality of the air and how it might affect a person’s health. The pollutant with the highest AQI value for a particular hour sets the overall AQI for that hour. The AQI is used to categorize the air quality of a region as one of five levels of quality: good, moderate, unhealthy for sensitive groups, unhealthy, or very unhealthy. “In Minnesota, higher AQIs in the summer are increasingly attributed to smoke from the Canadian wildfires and those in the northern Rockies.”⁶⁹ This trend is expected to continue.

⁶⁸ U.S. Environmental Protection Agency. 2025. *Current Nonattainment Counties for All Criteria Pollutants*. Available at: <https://www3.epa.gov/airquality/greenbook/ancl.html>. Accessed March 2026.

⁶⁹ Minnesota Pollution Control Agency. 2026. *Understanding the air quality index (AQI)*. Available at: <https://www.pca.state.mn.us/air-water-land-climate/understanding-the-air-quality-index-aqi>. Accessed March 2026.

The Project is located nearest to the air quality monitor in St. Cloud, Minnesota. This station monitors for O₃ and PM_{2.5}. Data is not yet available for 2025. The AQI for St. Cloud for each of the last five available years is provided in **Table 22**.

Table 22 Days in Each Air Quality Index Category (St. Cloud, MN)⁷⁰

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2024	282	84	3	2	1
2023	199	152	11	3	0
2022	204	72	0	0	0
2021	262	94	3	2	1
2020	309	57	0	0	0

Corona discharge can produce O₃ and oxides of nitrogen (NO_x) in the air surrounding the conductor. O₃ is a very reactive form of oxygen molecule that combines readily with other elements and compounds in the atmosphere, making it relatively short lived. O₃ 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 O₃ 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 (e.g., humid, rainy, or foggy conditions) actually inhibit the production of O₃.

6.8.1.1. Potential Impacts

The ROI for Air Quality is Stearns and Meeker counties. Potential impacts during construction are expected to be short term, of a small size, and not affect a unique resource. Temporary and localized air quality impacts caused by construction vehicle emissions and fugitive dust from 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.

Emissions Related to Construction

During construction of the Project, 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.

Table 23 summarizes the estimated potential emissions of criteria pollutants from construction activities for the Project. Construction emissions are based on typical counts of diesel-fueled

⁷⁰ Minnesota Pollution Control Agency. 2026. *Count of annual AQI days by category*. Available at: <https://data.pca.state.mn.us/views/Minnesotaairqualityindex/CountofannualAQIdaysbycategory?%3Aembed=y&%3AisGuestRedirectFromVizportal=y>. Accessed March 2026.

construction equipment, expected hours of operation, and estimated vehicle miles traveled. Detailed construction emission calculations are provided as **Appendix J**.

Table 23 Construction Emission of Criteria Pollutants (tons)

Description	NO _x	CO	VOC ^a	SO ₂	PM ₁₀	PM _{2.5}
Off-Road Engine Emissions	3.46	0.73	0.22	0.00	0.13	0.13
Unpaved Roads	--	--	--	--	0.23	0.02
Earthmoving	--	--	--	--	4.12	0.44
TOTAL	3.46	0.73	0.22	0.00	4.48	0.58
^a Volatile organic compounds.						

Emissions Related to Operation

Corona-induced O₃ and NO_x are typically not a concern for transmission lines with operating voltages below 161-kV, like the Project, because the EF intensity is too low to produce significant corona. Therefore, Great River Energy and Meeker Energy expect O₃ and NO_x concentrations associated with the Project to be negligible, and well below all federal standards.

6.8.1.2. Mitigation Measures

The Applicants and their contractors will implement appropriate dust control measures, including but not limited to:

- reduced speed limits, and use of water or other non-chloride-containing dust suppression applications on unpaved roads;
- water application to the Proposed ROW if wind erosion occurs during dry weather;
- street sweeping where soils are tracked onto paved roads; and
- if soil is wet during construction activities, vehicle tracking of soil from work areas that could dry and become sources of fugitive dust emissions will be minimized by using wooden or plastic construction mats at access points.

At the completion of construction activities, all construction-related air impacts will cease. Once the Project is operational, vehicles used for maintenance activities, as described in **Section 5.1.6**, will produce negligible impacts to air quality.

6.8.1.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions related to dust control, including minimizing erosion and sedimentation.

6.8.2. Climate Change and Resilience

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 is already changing and will continue to do so. Noticeable effects in the future

include warmer periods during winter and at night, increased precipitation, heavier downpours, increased summer heat, and the potential for longer dry spells.⁷¹ The Applicants used the Minnesota Environmental Assessment Worksheet Guidance: Developing a Carbon Footprint and Incorporation Climate Adaptation and Resilience⁷² to evaluate climate adaptation and resilience.

Given the majority of the Project is located in Stearns County, the Applicants reviewed climate trends for Stearns County using the MDNR Minnesota Climate Trends website.⁷³ From 1980 to 2026, Stearns County experienced an increase in average temperature of 0.43 degrees Fahrenheit per decade. During this same period, the average low temperature increased 0.48 degrees Fahrenheit per decade. Precipitation has increased in Stearns County by 0.28 inches per decade with periods of extended drought in the late 1980s, 2007, and 2023. The overall drought severity index shows a trend of 0.87 per decade for the month of May. This is based on the Palmer Drought Severity Index, which is an index that generally corresponds to moisture excess or deficit. A positive number represents moisture excess, so 0.87 per decade corresponds with less severe drought over time.

Climate hazard projections estimate the occurrence of extreme heat, drought, wildfire, and flooding hazards into the 2040s. To provide conservative estimates, the Applicants used the “higher emissions” category. Estimates are associated with an increase or decrease from the baseline period of 1976 to 2005 to the mid-century (2035-2064).⁷⁴ The number of days with a maximum temperature above 90-, 95-, and 100-degrees Fahrenheit could increase by 36 days, 16 days, and 4 days, respectively. Cooling degree days, a measure associated with the demand for energy to cool buildings interiors, might increase from 501.9 to 1,309.6 cooling degree days showing an increase demand for electricity in Stearns County. Annual precipitation might increase by about 2.1 inches from baseline. Average annual total precipitation might increase by about 2.1 inches from baseline. The number of days per year with no precipitation and the maximum number of consecutive dry days could decrease by 1.7 and 1.8 days, respectively. Additionally, while total precipitation could increase, that increase is not expected to significantly increase the number of consecutive wet days or increase the number of days with greater than 1, 2, or 3 inches of total precipitation. Except for maximum temperature, metrics related to wildfire potential remain steady.

⁷¹ Minnesota Department of Natural Resources. 2026. *Climate Trends*. Available at: https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html. Accessed March 2026.

⁷² Minnesota Environmental Quality Board. 2026. *Minnesota Environmental Assessment Worksheet Guidance: Developing a Carbon Footprint and Incorporation Climate Adaptation and Resilience June 2024*. Available at: <https://www.eqb.state.mn.us/environmental-review/guidance-practitioners/environmental-assessment-worksheet-eaw-guidance>. Accessed March 2026.

⁷³ Minnesota Department of Natural Resources. 2026. *Minnesota Climate Trends*. Available at: <https://arcgis.dnr.state.mn.us/ewr/climate-trends>. Accessed March 2026.

⁷⁴ Climate Mapping for Resilience and Adaptation. 2026. Available at: *Climate Mapping for Resilience and Adaptation v2.0*. Available at: <https://livingatlas.arcgis.com/assessment-tool/explore/details>. Accessed March 2026.

6.8.2.1. Potential Impacts

The ROI for Climate Change and Resilience is Stearns County.⁷⁵ Potential impacts are anticipated to be negligible.

While total precipitation is expected to increase as well as the intensity of future storms, models indicate that precipitation totals over 1 inch are not expected to increase significantly over current levels. Therefore, increased risks associated with flooding are not anticipated. Moreover, the Project is not located within a mapped floodplain.

Models show an increase in cooling degree days that will require more electricity to cool homes. The Project will help to maintain the reliability and resiliency of the electrical grid in the region, helping to protect Meeker Energy customers from extreme heat events. This impact will be long term and positive.

6.8.2.2. Mitigation Measures

Transmission lines are designed with extreme weather in mind, mitigating potential effects from the chance of increased number and intensity of severe storms. Wildfire risks in the Project area are not anticipated to increase over future conditions. Great River Energy is actively assessing risks to the reliable operation of its transmission system from the potential impacts of climate change and are working on opportunities to mitigate those risks. The Applicants do not propose additional mitigative measures specific to climate change.

Great River Energy is making efforts to strengthen electric infrastructure and make it less susceptible to damage. Resilience initiatives include, but are not limited to, upgrades to transformers and circuit breakers, remote monitoring, and emergency response plans.⁷⁶

6.8.2.3. Typical Route Permit Conditions

Route permits issued by the Commission typically do not include standard conditions that specifically address climate change and resiliency.

6.8.3. **Greenhouse Gas Emissions**

Greenhouse gases (GHG) are gaseous emissions that trap heat in the atmosphere and contribute to climate change. These emissions occur from natural processes and human activities. The most common GHGs emitted from human activities include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O). Sulfur hexafluoride (SF₆), a GHG, is used as an insulating material in substation breakers. Under normal operations and with adequate routine maintenance, the SF₆ remains contained in the breakers and is not released to the atmosphere.

⁷⁵ Because 98 percent of the total ROW is in Stearns County—with the 2 percent in Meeker County overlapping existing road ROW along the county line—Stearns County data is presented in this section because it is more representative of the Project.

⁷⁶ Great River Energy. 2024. *A Continued Focus on Reliability*. Available at: <https://greatriverenergy.com/transmission/a-continued-focus-on-resiliency/>. Accessed August 2026.

Deforestation is a source of CO₂ to the atmosphere, as trees and forest land act as a carbon sink, absorbing CO₂ from the atmosphere and storing it. Removing forests releases most of the stored carbon stock, either through burning or decay. Deforestation also eliminates future CO₂ capture potential.

The State of Minnesota is taking significant action to reduce the amount of GHG emissions produced in the state. The 2007 Next Generation Energy Act set statutory benchmarks to reduce GHG emissions 15 percent from 2005 levels by 2015, 30 percent by 2025, and 80 percent by 2050. In 2023, the Minnesota Legislature adopted new goals included in Minnesota’s Climate Action Framework to reduce emissions 50 percent by 2030 (from a 2005 baseline) and achieve net-zero emissions by 2050. As of 2022, Minnesota has experienced a 14 percent reduction in greenhouse gas emissions across all sectors based on 2005 levels.⁷⁷ While electrical generation emissions decreased by 50 percent, GHG emissions from residential, commercial, and industrial sources increased. Transportation is now the highest emitting source of GHG emissions in Minnesota.⁷⁸

6.8.3.1. Potential Impacts

The ROI for GHG emissions is Stearns and Meeker counties. Construction of the Project will result in a temporary increase of GHG emissions from fuel combustion in construction equipment and associated vehicles. Because the transmission line follows existing rights-of-way and the substation will be constructed in an agricultural row crop field, no GHG emissions related to land use change were calculated. Impacts from deforestation are negligible. **Table 24** summarizes the estimated potential emissions of GHGs from construction activities for the Project. Emissions are based on estimated counts of diesel-fueled construction equipment, expected duration of equipment operation, and estimated miles traveled for commuter vehicles, delivery trucks, and cement trucks. Detailed GHG emission calculations for the Project are provided as **Appendix J**. At the completion of construction activities, all construction-related greenhouse gas emissions will cease.

Table 24 Preliminary Estimate of Construction Greenhouse Gas Emissions, in Short Tons⁷⁹

Description	CO ₂	CH ₄	N ₂ O	CO ₂ e
Off-Road Engine Emissions	155.56	0.01	0.00	156.07
On-Road Engine Emissions	28.06	0.00	0.00	28.06
TOTAL	183.62	0.01	0.00	184.13
Notes: CO ₂ – carbon dioxide; CH ₄ – methane; 1 short ton CH ₄ = 28 short tons CO ₂ e; N ₂ O – nitrous oxide; 1 short ton N ₂ O = 265 short tons CO ₂ e; CO ₂ e – carbon dioxide equivalent				

⁷⁷ Minnesota Pollution Control Agency. 2025. *Greenhouse gas emissions in Minnesota 2005-2022*. Available at <https://www.pca.state.mn.us/sites/default/files/lraq-3sy25.pdf>. Accessed March 2026.

⁷⁸ Minnesota Pollution Control Agency. 2025. *GHG emissions and sequestration from 2005 to 2022, by sector*. Available at: <https://data.pca.state.mn.us/views/Greenhousegasemissionsdata/Emissionsbysector2005-2023?%3Aembed=y&%3AisGuestRedirectFromVizportal=y>. Accessed March 2026.

⁷⁹ National Archives. 2026. *Code of Federal Regulations. Table A-1 to Subpart (subp.) A of Part 98 – Global Warming Potentials, 100-Year Time Horizon*. Available at: <https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-A/appendix-Table%20A-1%20to%20Subpart%20A%20of%20Part%2098>. Accessed March 2026.

Minnesota's Greenhouse Gas Inventory shows emissions within Minnesota totaled 117,493,456 metric tons (129,477,789 short tons) of carbon dioxide equivalent (CO₂e) in 2023.⁸⁰ Minnesota Rule 4410.4300, subp. 15, Part B, establishes a mandatory category requiring preparation of an Environmental Assessment Worksheet for stationary source facilities generating 100,000 short tons of GHGs per year. Accordingly, the preliminary estimate of Project GHG emissions, when compared to statewide levels and to the regulatory requirement for additional study for projects based on GHGs, would be negligible.

GHG emissions associated with operation of the Project include vehicle and equipment emissions related to inspections and maintenance activities. Impacts from operation of the Project will be intermittent and short term. As discussed in **Section 5.1.6**, Great River Energy inspects the condition of its transmission line and structures on an adaptive schedule. There is typically a post-construction review approximately 1 year after construction. After that, Great River Energy generally inspects its 115-kV transmission lines every 2 years to determine if clearing is required. A 3- to 7-year cycle of vegetation maintenance is desirable (see **Section 3.7**). Line and structure maintenance activities will occur as necessary but are not expected to be needed on a regular basis. Meeker Energy will conduct routine maintenance at the Kimball Substation.

6.8.3.2. Mitigation Measures

The Applicants will mitigate vehicle emissions by ensuring the construction contractor keeps equipment in good working order and limits vehicle idling. No additional mitigation is proposed.

6.8.3.3. Typical Route Permit Conditions

Route permits issued by the Commission typically do not include standard conditions that specifically address greenhouse gas emissions.

6.8.4. **Geology and Topography**

The Hardwood Hills subsection of the Ecological Classification System indicates that the depth of glacial sediment to bedrock varies from 100 to 500 feet.⁸¹ Depth to bedrock along the Project Route varies from approximately 100 to 150 feet.⁸² The underlying bedrock includes Cretaceous-aged sedimentary rocks such as sandstone, siltstone, and shale.⁸³

⁸⁰ Minnesota Pollution Control Agency. 2025. *Minnesota Greenhouse Gas Inventory. Minnesota's greenhouse gas emissions and statutory goals*. Available at: <https://data.pca.state.mn.us/views/Greenhousegasemissionsdata/TotalGHGemissionsgoals?%3Aembed=y&%3AisGuestRedirectFromVizportal=y>. Accessed May 2026.

⁸¹ Minnesota Department of Natural Resources. 2026. *Ecological Classification System. Hardwood Hills Subsection*. Available at: <https://www.dnr.state.mn.us/ecs/222Ma/index.html>. Accessed March 2026.

⁸² Setterholm, D. R. 1995. *Depth to Bedrock and Thickness of Cretaceous Strata. County Atlas Series, Atlas C-10, Part A. Plate 5 – Depth to Bedrock*. Available at: <https://conservancy.umn.edu/server/api/core/bitstreams/d377ce77-ebf9-4bff-8283-505fd589b535/content>. Accessed March 2026.

⁸³ Boerboom et al., 1995. Boerboom, T. J., D. R. Setterholm, and V. W. Chandler. 1995. *Bedrock Geology. County Atlas Series, Atlas C-10, Part A. Plate 2 – Bedrock Geology*. Available at: <https://conservancy.umn.edu/server/api/core/bitstreams/845d5f14-cac7-437e-860e-41e157ec932c/content>. Accessed March 2026.

The Proposed Route moves generally east to west over relatively flat terrain, with approximately 85 feet of elevation change occurring throughout the Proposed Route.⁸⁴

6.8.4.1. Potential Impacts

The ROI for Geology and Topography is the Proposed ROW. Constraints due to geology will not result in an impact on the design, construction, or operation of the Project. Given the depth to bedrock ranges from 100 to 150 feet, transmission line structures or their foundations, as well as substation foundations, will not impact subsurface geologic features.

The transmission line will be constructed at existing grade. Limited, if any, grading will occur that significantly modifies the topography within the Proposed ROW. Once construction is complete, graded areas will be restored to match pre-existing contours to the extent possible. Like the transmission line, the Kimball Substation will be constructed at existing grade. However, grading will occur to level the site. Earthwork will ensure adequate site drainage.

6.8.4.2. Mitigation Measures

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

6.8.4.3. Typical Route Permit Conditions

Typical route permit conditions require permittees to implement erosion prevention and sediment control practices, which would also be anticipated to minimize impacts on geologic and resources.

6.8.5. **Rare and Unique Natural Resources**

Data on federal and state-protected species were reviewed for the Project using the USFWS IPaC online tool and the MDNR Minnesota Conservation Explorer (MCE) online review tool utilizing Merjent's current data license for the Natural Heritage Inventory System (NHIS) database (License Agreement #2026-001). Although this review does not represent a comprehensive survey, it provides information on the potential for the presence of protected species within the Project Area, which is 1 mile from the Project's centerline.

6.8.5.1. Native Plant Communities and Sites of Biodiversity Significance

Native plant communities (NPC) are groups of native plants not significantly altered by human activities or by introduced species. The MDNR classifies NPCs in Minnesota by considering a variety of features, including hydrology, vegetation, soils, topography, and natural disturbance regimes (e.g., fire, floods, drought). NPC classifications are used throughout Minnesota for vegetation management, conservation, and land-use planning. The classification is based on plant species composition and was developed through field data collected from sample plots. The classification system is hierarchical with units described at levels ranging from landscape scale

⁸⁴ Minnesota Department of Natural Resources. 2026. *MN TOPO*. Available at: <https://mntopo.dnr.state.mn.us/>. Accessed March 2026.

systems to local communities.⁸⁵ The Project Area does not cross any native plant ecological systems.

Through the Minnesota Biological Survey (MBS), MDNR systematically collects, interprets, and delivers baseline data on the distribution and ecology of rare plants, rare animals, NPC classes, and functional landscapes and designates sites which exhibit these characteristics as Sites of Biodiversity Significance (SOBS).

SOBS are assigned one of four ranks based on several factors, including the quality (e.g., size and condition) of NPC within the site, the presence and numbers of rare species populations, and the site's context within the landscape (e.g., whether the site is isolated in a landscape dominated by cropland or developed land, or whether it is contiguous with or close to other areas with intact NPCs). There are four ranks of SOBS: outstanding (i.e., having the best occurrences of the rarest species, NPCs, and most ecologically intact/functional landscape), high, moderate, and below.⁸⁶ The Project Area does not cross any SOBS.

6.8.5.2. State-Listed Species

Minnesota Statute § 84.0895 prohibits the take, import, transport, or selling of any portion of an endangered species or wild animals or plants. Merjent, on behalf of Great River Energy, submitted a formal Natural Heritage Review Request (2026-00256) on March 23, 2026, through the MDNR's MCE⁸⁷ online tool. An automated response provided on March 23, 2026, by the MCE indicated that further review is required by the MDNR for state-listed endangered or threatened species. Pending the formal review by MDNR, the Applicants' consultant, Merjent, utilized their current NHIS license to access the NHIS database to identify state-listed threatened and endangered species that may have the potential to occur within 1-mile of the transmission line centerline. One state-listed species provided in **Table 25** below has been documented near the Project Area. A formal review from MDNR was received on April 17, 2026, confirming the initial results found by Merjent.

Table 25 State Protected Species within One Mile of the Project Study Area

Common Name	Scientific Name	State Status
Blanding's Turtle	<i>Emydoidea blandingii</i>	Threatened

Blanding's Turtle

The Blanding's turtle was once a widespread species found throughout the eastern and central portions of the United States; however, now this species is restricted to a few areas within the Upper Midwest, New England, and southeastern Canada. The Blanding's turtle is found in wetland

⁸⁵ Minnesota Department of Natural Resources. 2026. *Minnesota's Native Plant Communities*. Available at: <https://www.dnr.state.mn.us/npc/index.html>. Accessed March 2026.

⁸⁶ Minnesota Department of Natural Resources. 2026. *MBS Site Biodiversity Significance Ranks*. Minnesota Biological Survey. Available at: https://www.dnr.state.mn.us/eco/mbs/biodiversity_guidelines.html. Accessed March 2026.

⁸⁷ Minnesota Department of Natural Resources. n.d. *Minnesota Conservation Explorer*. Available at: <https://mce.dnr.state.mn.us/>. Accessed March 2026.

complexes with calm, shallow waters (including wetlands associated with rivers and streams with rich aquatic vegetation), and adjacent sandy uplands. In Minnesota, this species has been found utilizing a range of habitats depending on the region, such as shrub wetlands in central Minnesota, open marshes and bottomland wetlands in the southeastern part of the state, and deeper marshes and backwater pools in the southwest. Often, females will utilize agricultural fields to nest.

Suitable overwintering habitat (e.g., muddy bottoms of deep marshes, backwater pools, ponds, and streams), summer foraging, and nesting habitat (e.g., sparsely vegetated uplands with well-drained soils) are present in the Project Area. Specifically, within the Project’s Proposed Route, County Ditch 20 and numerous freshwater emergent wetlands and freshwater shrub wetlands have been mapped through the USFWS National Wetland Inventory that may serve as habitat for the species.

6.8.5.3. Federally Listed Species

The ESA of 1973 as amended provides protective measures for federally listed threatened and endangered species, including their habitats, from unlawful take (16 U.S.C. §§ 1531–1544). The ESA defines take to mean “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or to attempt to engage in any such conduct.” The ESA Section 7(a)(2) requires consultation with USFWS if a federal agency undertakes, funds, permits, or authorizes any action that may impact endangered or threatened species or designated critical habitat. This includes issuing a federal permit, such as a Clean Water Act Section 404 permit from USACE.

Merjent, on behalf of the Great River Energy, reviewed the USFWS IPaC online tool for a list of federally threatened, endangered, proposed, and candidate species and designated critical habitat that may be present within the vicinity of the Project Area on March 23, 2026. The IPaC query identified four species that may be present within the vicinity of the Project Study Area, as described in **Table 26**. No federally designated critical habitat is present within the Project Area.

Table 26 Federally Protected Species within the Project Area

Common Name	Scientific Name	Federal Status
Whooping crane	<i>Grus americana</i>	Experimental, non-essential
Monarch butterfly	<i>Danaus plexippus</i>	Proposed Threatened
Suckley’s cuckoo bumble bee	<i>Bombus suckleyi</i>	Proposed Endangered
Western regal fritillary	<i>Argynnis idalia occidentalis</i>	Proposed Threatened

Whooping Crane

The historic range of the whooping crane extended from the Arctic coast south to central Mexico, and from Utah east to New Jersey, into South Carolina, Georgia, and Florida. There are now only four populations of whooping cranes in North America. One (i.e., the Aransas/Wood Buffalo population) is a self-sustaining, wild population, the second is a non-migratory, captive-raised population in central Florida, and a third is a non-migratory flock introduced to White Lake, Louisiana in 2011.

A fourth population consists of captive-raised birds that migrate between Wisconsin and Florida; this population is considered by the USFWS to be an experimental, non-essential population. The

intent is to establish a migratory flock which will summer and breed in central Wisconsin and migrate to west-central Florida to over-winter. The USFWS considers the range of this population to include portions of Minnesota. The species utilizes a number of different habitat types during migration, breeding, wintering, and foraging. In the upper Midwest, birds likely forage in marshes, lakes, open ponds, as well as upland swales, wet meadows and rivers, pastures, and agricultural fields. Suitable stopover habitat for resting and foraging is present within the Project Area at waterbodies and within agricultural fields. Agricultural fields may provide foraging opportunities for whooping cranes should individuals be migrating through the Project Area post-harvest when waste grains could be present.

Non-essential experimental populations are treated as threatened species on National Wildlife Refuge and National Park lands and as a proposed species on private land. As the Project occurs on private lands, this population is treated as a proposed species; proposed species are not afforded legal protection under the ESA.

Monarch Butterfly

The monarch butterfly is a large butterfly with an approximate three- to four-inch wingspan and characterized by bright orange coloring on the wings with distinctive black borders and veining, serving as a warning sign to predators of their toxicity. In North America, the species is split into two populations (i.e., eastern and western), both well known for their long-distance migration. During the fall, both populations begin migrating to their overwintering locations, where they require a specific microclimate with a temperature that prevents excessive lipid depletion but also prevents freezing. At overwintering sites, monarchs undergo reproductive diapause until the spring when males and females begin mating before dispersing north again. The eastern population migrates from Mexico to Canada, reproducing two to three generations while migrating. The western population migrates north and east from coastal California toward the Rockies and Pacific Northwest, also reproducing into multiple generations.

Throughout the migration corridor and during the breeding cycles, monarchs can be found in a wide variety of habitats including prairies, grasslands, urban gardens, road ditches, and agricultural fields if there is a healthy and abundant supply of nectar resources for foraging that are diverse and of sufficient quality. The patch size and location of this type of habitat is important for monarchs as well. Milkweed must also be of sufficient quality and quantity as it is the sole host plant for oviposition and for the larvae to feed until the larvae pupate into a butterfly.⁸⁸

On December 12, 2024, the USFWS published a proposed rule to the federal register to list the monarch as threatened with a 4(d) rule. Proposed species are not protected under the ESA. Suitable foraging and reproductive habitat for monarchs is likely present within the Project Area.

Suckley's Cuckoo Bumble Bee

The Suckley's cuckoo bumble bee's (Suckley's) range spans from the Yukon south to Arizona and as far as Newfoundland in a widely distributed range of elevations. As identified in the IPaC review

⁸⁸ U.S. Fish and Wildlife Service. 2024. *Monarch Butterfly (Danaus plexippus) Species Status Assessment Report, Version 2.3 (December 2024)*. Available at: https://www.fws.gov/sites/default/files/documents/2025-01/ssa_monarch-butterfly_2024.pdf. Accessed March 2026.

done for this Application, the species may occur within the Project Area (see **Appendix D**). Suckley's are obligatory social parasites of social bumble bees and cannot successfully reproduce without the availability of suitable host colonies. Host bumble bee nests are often found in abandoned underground holes in a variety of habitat types including meadows, fallow fields, croplands, urban areas, and forests. When females of this species come out of hibernation, they take over the nest of a suitable host colony (most notably, western bumble bees (*Bombus occidentalis*) and Nevada bumble bees (*Bombus nevadensis*) and the host workers provide for the Suckley's young. A generalist, adult females, eggs, larvae, male drone, and new females all require a diversity of native floral resources for pollen and nectar. Little is known about the overwintering sites; however, thermal suitability is required throughout their life cycle. Females overwinter underground in areas separate from nesting habitat, likely using loose substrates such as leaf litter, duff, or rotting logs.⁸⁹

On December 17, 2024, the USFWS published a proposed rule listing the Suckley's cuckoo bumble bee as federally endangered under the ESA. Proposed species are not protected under the ESA. Suitable foraging and nesting habitat for Suckley's cuckoo bumble bee is likely present within the Project Area.

Western Regal Fritillary

The western regal fritillary is found in large, intact, contiguous native tallgrass prairie habitats in portions of Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma, South Dakota, Wisconsin, and Wyoming. Regal fritillaries can range widely with females potentially traveling up to 100 miles searching for three main habitat components: violet hostplants for larvae, nectar plants for adults, and native grasses to provide protection throughout the life cycle. Adults can be found foraging in both upland and wet prairie habitats; however, habitat can only be considered suitable for all life stages if violet species are present to provide shelter and forage for larvae. The density of violets seems to correlate positively to the number of butterflies within a given area. Habitat alteration has reduced the species' range and abundance.⁹⁰

On August 6, 2024, the USFWS proposed to list the eastern regal fritillary (*Argynnis idalia idalia*) as an endangered species and to list the western regal fritillary (*A. i. occidentalis*) as a threatened species under the ESA. Proposed species are not protected under the ESA. Suitable prairie habitat may be present in the Project Area; however, it is not present within the Project's Proposed Route.

6.8.5.4. Potential Impacts

The ROI for rare and unique resources is the Project Area. Potential impacts are expected to be negligible.

⁸⁹ US Fish and Wildlife Service. 2024. *Suckley's Cuckoo Bumble Bee (Bombus suckleyi) Species Status Assessment, Alaska Region, Version 1 (August 2024)*. Available at: <https://iris.fws.gov/APPS/ServCat/DownloadFile/263505>. Accessed March 2026.

⁹⁰ US Fish and Wildlife Service. 2024. *Endangered and Threatened Wildlife and Plants; Endangered Status for the Eastern Regal Fritillary and Threatened Status with Section 4(d) Rule for the Western Regal Fritillary, Proposed Rule*. Available at: <https://www.govinfo.gov/content/pkg/FR-2024-08-06/pdf/2024-16982.pdf>. Accessed March 2026.

Native Plant Communities and Sites of Biodiversity Significance

The Project does not cross any NPCs or MBS SOBS, or Scientific and Natural Areas. Potential impacts to these resources are not expected to occur.

State-Listed Species

Impacts to listed species is dependent on the species' lifecycle, mobility, and migration patterns.

Blanding's Turtle

The ROI for the Blanding's turtle is the Project Area. Suitable overwintering and summer foraging and nesting habitat is present in the Project Area. More specifically, the Proposed ROW crosses potentially suitable upland nesting and foraging habitat, and impacts to the species are possible if Project activities are conducted in these areas during the species' active period (i.e., March – October). The Project does not cross suitable wetlands or waterbodies and will not impact overwintering habitat for the species. The Applicants will implement the conservation measures described in the April 17, 2026 MDNR response to the MCE review to avoid and minimize impacts on suitable nesting habitat during the nesting period (i.e., May – October). Furthermore, the Applicants will submit an MCE online request within one year of Project construction to confirm that there are no additional avoidance and minimization recommendations. Therefore, impacts on individuals are anticipated to be minimal and will not result in taking of Blanding's turtles.

Federally Listed Species

Impacts to listed species is dependent on the species' lifecycle, mobility, and migration patterns.

Whooping Crane

The ROI for whooping cranes is the Project Area. Suitable stopover habitat for this species is present in the Project Area. In addition, suitable stopover and foraging habitat may be present in portions of the Proposed ROW. However, proximity to existing roads makes these areas marginally suitable stopover sites, and impacts from the Project are expected to be minimal as the species is highly mobile and would likely avoid the Project Area altogether, traveling to areas offering suitable habitat and less human disturbance. As such, the Project will not result in unauthorized take of whooping cranes.

Monarch Butterfly

The ROI for monarch butterflies is the Project Area. Suitable foraging and reproductive habitat for the species is present throughout the Project Area. In addition, these habitats are likely present within the Proposed ROW. Work in the Proposed ROW during the species' active season (i.e., April – September) when adults or larvae are present may impact individuals via collisions and/or crushing by vehicles and equipment. However, adults are mobile and will likely not be impacted by Project activities due to their ability to leave and/or avoid Project workspaces. Loss of foraging and reproductive habitat may also impact individuals. However, suitable foraging and reproductive habitats are present in the areas surrounding proposed Project workspaces, and most disturbances

within the Project area will be temporary. In addition, proposed species are not protected under the ESA. As such, Project will not result in unauthorized take of monarch butterflies.

Suckley's Cuckoo Bumble Bee

The ROI for Suckley's cuckoo bumble bees is the Project Area. Potentially suitable summer foraging and nesting habitat for the species may be present in the Project Area. In addition, these habitats may be present in portions of the Proposed ROW. Work in the Proposed ROW during the species' active season (i.e., April – September) may impact individuals via collisions and/or crushing by vehicles and equipment. Loss of foraging and reproductive habitat may also impact individuals. Ground disturbing activities, including travel lanes and vehicle and equipment staging areas may result in crushing of below-ground nests. However, suitable foraging habitat is present in the areas surrounding proposed Project workspaces, and most disturbances within the Project area will be temporary. In addition, proposed species are not protected under the ESA. As such, Project will not result in unauthorized take of Suckley's cuckoo bumble bees.

Western Regal Fritillary

The ROI for western regal fritillary is where the Project Area crosses undisturbed grasslands. Suitable foraging and reproductive habitat for the species may be present in the Project Area. However, these habitats may be present in some small portions of the Proposed ROW. Similar to the impacts discussed above for the monarch butterfly, work in the Proposed ROW during the species' active season (i.e., April – September) when adults or larvae are present may impact individuals via collisions and/or crushing by vehicles and equipment, and loss of foraging and reproductive habitat may also impact individuals. However, adults are mobile and will likely not be impacted by Project activities due to their ability to leave and/or avoid Project workspaces, and suitable foraging and reproductive habitats are present in the areas surrounding proposed Project workspaces. Most disturbances within the Project area will be temporary. In addition, proposed species are not protected under the ESA. As such, Project will not result in unauthorized take of western regal fritillaries.

6.8.5.5. Mitigation Measures

The Applicants will continue to coordinate with the MDNR and USFWS to avoid and minimize impacts on listed species. The following general measures will be used to help avoid or minimize impacts to rare natural resources during and after the construction of the Project:

- Constructing within, or adjacent to, existing right-of-way where possible, minimizing impacts to habitat.
- Using BMPs to prevent soil erosion in areas of impact.
- Implementing sound water and soil conservation practices 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.
- Re-vegetating disturbed areas with native species and wildlife conservation species, where applicable and if the landowner agrees.

- Implementing raptor protection measures, including following Avian Power Line Interaction Committee (APLIC) Avian Safe Design recommendations and placement of bird flight diverters on the transmission line after consultation with USFWS and MDNR, if needed.
- Reporting any bald eagle nest discovered during survey of the transmission line or in the land acquisition process to the USFWS and adhering to guidance provided by the agency.
- If the USFWS determines the monarch butterfly, Suckley's cuckoo bumble bee, and/or the Western regal fritillary should be listed and protections for the species coincide with Project planning, permitting, or construction, the Applicants will review Project activities for potential impacts to the species and develop appropriate avoidance and mitigation measures, and confer with the USFWS as appropriate.

Native Plant Communities and Sites of Biodiversity Significance

As described above, the Project does not cross these areas; therefore, mitigation is not required.

State-Listed Species

As described above, the Applicants will avoid and minimize impacts to state-listed species to the extent possible. The Applicants will resubmit an MCE online request with the MDNR within one year of construction to confirm any additional avoidance and minimization recommendations. If it is determined impacts cannot be avoided, the Applicants will coordinate with the MDNR to mitigate impacts.

Federally Listed Species

If the USFWS lists the monarch butterfly, Suckley's cuckoo bumble bee, and/or the Western regal fritillary as protected under the ESA, and it is determined that Project activities are reasonably certain to cause take of listed species, the Applicants will develop additional avoidance and minimization measures to ensure the Project does not result in unauthorized take. During this process, the Applicant will confer with the USFWS, as needed.

6.8.5.6. Typical Route Permit Conditions

Route permits issued by the Commission typically contain the avoidance and minimization measures relevant to vegetation, waterways, and wildlife.

6.8.6. Soils

Soil characteristics within the Proposed ROW were assessed using the Soil Survey Geographic Database (SSURGO).⁹¹ SSURGO is a digital version of the original county soil surveys developed by the USDA NRCS for use with geographic information systems software. It provides the most

⁹¹ Soil Survey Staff. 2026. *Web Soil Survey*. Available at: <https://websoilsurvey.sc.egov.usda.gov/>. Accessed March 2026.

detailed level of soils information for natural resource planning and management. Soils maps are linked to information about the component soils and their properties.⁹²

A soil series is the lowest category of the national soil classification system.⁹³ Each series represents a homogenous set of soil properties that distinguish it from soils of a different series. This includes characteristics, drainage, location, use, and vegetation. Several soil series are crossed by the Project. Koronis series soils account for 34 percent of soils in the Proposed ROW. These soils are very deep and well drained.⁹⁴ Lundlake soils represent about 12 percent of the Proposed ROW. These soils are associated with depressions, are very deep and very poorly drained.⁹⁵ No other soil type accounts for greater than 10 percent of soils in the right-of-way.

Soil characteristics within the Proposed ROW in comparison to the Proposed Route are summarized in **Table 27**. Characteristics are similar between the Proposed ROW and the Proposed Route. This summary is an overestimation of potential impacts as they show soils intersecting the Proposed ROW and Proposed Route, not necessarily where structures or workspaces will be located. Additionally, soils can have more than one characteristic, meaning they can be counted more than once. Soils that make up more than 15 percent of the Proposed ROW are discussed below.

Prime farmland, as defined by the NRCS, is “land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and that is available for these uses.”⁹⁶ Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods, and is not subject to frequent or prolonged flooding during the growing season. Soils that do not meet the above criteria may be considered prime farmland if the limiting factor is mitigated (e.g., by draining or irrigating).⁹⁷ Prime farmland is not necessarily used for agricultural production. SSURGO data represents soil characteristics, not land use characteristics. Areas designated as prime farmland could be in row crop agricultural production, pasture, woodland, or other uses. Urbanized land and open water cannot be designated as prime farmland. Prime farmland accounts for approximately 55 percent of the Proposed ROW.

The NRCS also recognizes farmlands of statewide importance, which are determined by state agencies. Farmland of statewide importance are "areas of soils that nearly meet the requirements for prime farmland and that economically produce high yields of crops when treated and managed

⁹² U.S. Department of Agriculture, Natural Resources Conservation Service. 2026. *National soil survey handbook, title 430-VI*. <https://directives.sc.egov.usda.gov>. Accessed March 2026.

⁹³ U.S. Department of Agriculture, Natural Resources Conservation Service. n.d. *Official Soil Series Descriptions*. Available at: <https://www.nrcs.usda.gov/resources/data-and-reports/official-soil-series-descriptions-osds>. Accessed April 2026.

⁹⁴ U.S. Department of Agriculture, Natural Resources Conservation Service. 2012. *Koronis Series*. Available at: https://soilseries.sc.egov.usda.gov/OSD_Docs/K/KORONIS.html. Accessed April 2026.

⁹⁵ U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. *Lundlake Series*. Available at: https://soilseries.sc.egov.usda.gov/OSD_Docs/L/LUNDLAKE.html. Accessed April 2026.

⁹⁶ Code of Federal Register. 2026. *Identification of Important Farmland*. Available on-line at: <https://www.ecfr.gov/current/title-7/subtitle-B/chapter-VI/subchapter-F/part-657/subpart-A/section-657.5>. Accessed March 2026.

⁹⁷ *Ibid*.

according to acceptable farming methods."⁹⁸ Farmland of statewide importance is similar to prime farmland, but with minor shortcomings such as greater slopes or less ability to store soil moisture. Nevertheless, these lands can be as productive as prime farmlands if managed properly and growing conditions are favorable. Farmland of statewide importance accounts for approximately 32 percent of the Proposed ROW.

Table 27 Summary of Soil Characteristics

Soil Characteristics	Right-of-Way		Proposed Route	
	Acres	Percent	Acres	Percent
Prime Farmland ^a	27.3	54.3%	107.1	50.9%
Farmland of Statewide Importance ^b	16.6	33.0%	75.2	35.7%
Wind Erodible ^c	5.2	10.3%	17.3	8.2%
Water Erodible ^d	8.5	16.8%	37.9	18.0%
Hydric ^e	11.5	22.8%	48.6	23.1%
Revegetation Concerns ^f	6.1	12.0%	27.2	12.9%
Compaction-Prone ^g	7.9	15.8%	32.9	15.6%
TOTAL	50.4	100.0%	210.5	100.0%
Note: Soils may have more than one characteristic. ^a Includes soils that meet the prime farmland or prime farmland if a limiting factor is mitigated. ^b Includes soils classified as farmland of statewide importance by SSURGO. ^c Includes soils in Wind Erodibility Group designation of 1 or 2. ^d Includes soils with a slope greater than 15 percent or soils with a K value of greater than 0.35 and slopes greater than 5 percent. ^e Includes soils that are classified as hydric by SSURGO. ^f Includes soils with a non-irrigated land capability classification of 4 or greater. ^g Includes soils in somewhat poor to very poor drainage classes with surface textures of clay loam and finer.				

Water erodible soils are typically bare or have sparse vegetative cover. These soils have non-cohesive soil particles (e.g., sand) and low water infiltration rates. Moderate to steep slopes can increase the rate of erosion. Water erodible soils account for approximately 16 percent of the Proposed ROW.

Hydric soils are "formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part. Most hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation that last more than a few days."⁹⁹ Some soils designated as hydric have phases that are not hydric depending on the water table, flooding, and ponding characteristics. Hydric soils are used as one of the defining properties of a wetland. Wetlands are discussed in **Section 6.8.8**. Hydric soils account for approximately 23 percent of the Proposed ROW.

⁹⁸ U.S. Department of Agriculture, Natural Resources Conservation Service. n.d. *Soil Data Access (SDA) Prime and other Important Farmlands*. Available at: https://efotg.sc.egov.usda.gov/references/public/LA/Prime_and_other_Important_Farmland.html. Accessed April 2026.

⁹⁹ U.S. Department of Agriculture, Natural Resources Conservation Service. 2024. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*. Available at: <https://www.nrcs.usda.gov/sites/default/files/2024-09/Field-Indicators-of-Hydric-Soils.pdf>. Accessed April 2026.

Soil compaction and rutting from heavy equipment adversely changes soil porosity and structure due to the mechanical deformation of the soil.¹⁰⁰ Compaction increases the bulk density of the soil resulting in reduced air and water movement through the soil and decreased root penetration.¹⁰¹ Compaction and rutting are related to moisture content and texture and are worse when medium and fine textured soils are subject to heavy equipment traffic when wet. Compaction prone soils account for approximately 16 percent of the Proposed ROW.

6.8.6.1. Potential Impacts

The ROI for soils is the Proposed ROW. Potential soil impacts associated with construction of the transmission line and the Kimball Substation are expected to be short term and of a small size. Long-term impacts are not expected. Most soils will be spanned; therefore, impacts are not expected in those areas.

Permanent soil impacts are associated with substation grading and structure placements. Soil structure and function will be lost at the substation. The substation footprint will be approximately 145 feet by 150 feet or 0.5 acre. A graveled area of approximately 11,000 square feet will be constructed for vehicle access and parking, for a total disturbed area of approximately 33,000 square feet (0.75 acre). Structure placement will also permanently impact soils. Typical structures will be 18 to 36 inches in diameter; the average diameter is expected to be 22 inches.

Temporary impacts include soil compaction and rutting associated with construction equipment traffic. Structure placement, along with vegetation clearing and grading at the substation, will expose soils to wind and water erosion. Additionally, limited grading might occur near structures if necessary to create a safe and level workspace. Construction of the substation will create new impervious surface; until permanent erosion control measures are in place stormwater runoff could cause increased erosion.

6.8.6.2. Mitigation Measures

As described in **Section 5.1.5**, the Applicants will take measures to alleviate soil compaction where needed. As described in **Sections 5.1.5** and **5.2.4**, exposed soil will be revegetated as soon as possible to minimize erosion. The Applicants will implement their Vegetation Management Plan (see draft provided in **Appendix I**) during construction and operation of the Project.

Additionally, to minimize erosion, and to mitigate sediment transport prior to, during and after construction activities, BMPs and / or other measures that will be identified in a SWPPP, if required, will be implemented. These measures will also protect adjacent and downgradient waters and wetlands from potential sediment inputs.

¹⁰⁰ University of Minnesota Extension. 2018. *Soil compaction*. Available at: <https://extension.umn.edu/soil-management-and-health/soil-compaction>. Accessed April 2026.

¹⁰¹ South Dakota State University Extension. September 2023. *Bulk Density is an Indicator of Soil Health*. Available at: <https://extension.sdstate.edu/bulk-density-indicator-soil-health>. Accessed April 2026.

6.8.6.3. Typical Route Permit Conditions

Route permits issued by the Commission typically contain avoidance and minimization measures relevant to soils, including implementing erosion control practices, stabilizing slopes, protecting soil stockpiles, and facilitating revegetation after construction is complete.

6.8.7. **Vegetation**

Vegetation can be generally characterized using the Ecological Classification System. The system was developed by the MDNR and USDA 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 Hardwood Hills Subsection.¹⁰²

The Eastern Broadleaf Forest Province is located in the “central and southeastern parts of Minnesota and 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 northeastern boundary is more diffuse, with a gradual transition between eastern deciduous forests and the mixed conifer-hardwood forests of northern Minnesota”.¹⁰³

The Minnesota & Northeast Iowa Morainal Section “is a long band of deciduous forest, woodland, and prairie that stretches nearly 350 miles (560 kilometers) from Polk County in northwestern Minnesota to the Iowa border”.¹⁰⁴ Prior to settlement, woodlands dominated the Hardwood Hills Subsection rather than prairie as the irregular topography and presence of numerous lakes and wetlands in the subsection provided protection from fire allowing forest to establish. “Mixed forests of oaks, sugar maple, basswood, and other hardwoods were present in fire protected sites” on the eastern boundary of the subsection¹⁰⁵. A mix of “tallgrass prairie, aspen-oak lands, and oak savanna was present along the prairie boundary to the west”.¹⁰⁶ Within the subsection, current vegetation and land use is primarily agricultural. However, some forested areas still occur adjacent to lakes and steep slopes.

The Proposed Route, which contains the proposed Kimball Substation, is reflective of the current vegetation and land use represented within Hardwood Hills Subsection as approximately 51 percent (104.5 acres) of the land is in agricultural production (cropland). Within the Project Route, the primary land cover land use type is also cropland followed by hay/pasture and to a lesser extent emergent wetlands and forested land. Vegetation is shown through satellite imagery in the Detailed Route Maps provided in **Appendix B**.

¹⁰² Minnesota Department of Natural Resources. 2025. *Ecological Classification System*. Available at: <https://www.dnr.state.mn.us/ecs/222Ma/index.html>. Accessed October 2025.

¹⁰³ *Ibid.*

¹⁰⁴ Minnesota Department of Natural Resources. n.d. *Minnesota & Northeast Iowa Morainal Section*. Available at: <https://www.dnr.state.mn.us/ecs/222M/index.html>. Accessed March 2026.

¹⁰⁵ Minnesota Department of Natural Resources. n.d. *Hardwood Hill Subsection*. Available at: <https://www.dnr.state.mn.us/ecs/222Ma/index.html>. Accessed March 2026.

¹⁰⁶ *Ibid.*

6.8.7.1. Potential Impacts

The ROI for Vegetation is the Proposed ROW. Potential impacts are anticipated to be minimal and do not affect a unique resource. Impacts will be short and long term.

Woody vegetation will be cleared during construction of the transmission line. Site preparation and structure placement will disturb or damage natural vegetation near structure locations. Because most of the Proposed ROW overlaps existing road and distribution rights-of-way, construction of the transmission line will generally impact open space and the edges of agricultural fields having minimal impact because this vegetation is currently altered by maintenance (mowing) and agricultural activities. These impacts will be incremental.

Long term impacts include continued maintenance of woody vegetation. Based on aerial imagery, Great River Energy will clear approximately 2.89 acres of trees within the Proposed ROW and maintain the ROW to ensure future growth does not interfere with the safe and reliable operation of the transmission line. Vegetation at the substation location will be permanently removed. Vegetation in this area is agricultural row crops—natural vegetation will not be impacted.

The movement of construction equipment to, from, and between various work sites has the potential to introduce or spread invasive species within the Proposed Route. Invasive and noxious species in Minnesota are regulated by the MDNR.¹⁰⁷ There are no known occurrences of invasive and noxious plant species within the Proposed ROW. The closest known observations of invasive plant species (tawny daylily and Tatarian maple) are about one-quarter mile south and southwest of the Proposed ROW. Due to the disturbed and developed nature of the Local Vicinity it is likely that undocumented invasive and noxious species are present.

6.8.7.2. Mitigation Measures

The Project will parallel existing roads and electric distribution lines for its entire length, minimizing impacts to vegetation. The Applicants will implement their Vegetation Management Plan (**Appendix I**) during construction and operation of the Project. To minimize the potential for the introduction or spread of invasive species, the Applicants will implement the following BMPs during construction:

- Weed-free straw or weed-free hay will be used for erosion control.
- Herbicidal or manual vegetation removal might 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.

¹⁰⁷ Minnesota Department of Agriculture. 2026. *Noxious and Invasive Weeds*. Available at: <https://www.mda.state.mn.us/plants-insects/noxious-invasive-weeds>. Accessed March 2026.

- The Construction Field Representative will oversee BMP installation and effectiveness.

6.8.7.3. Sample Route Permit

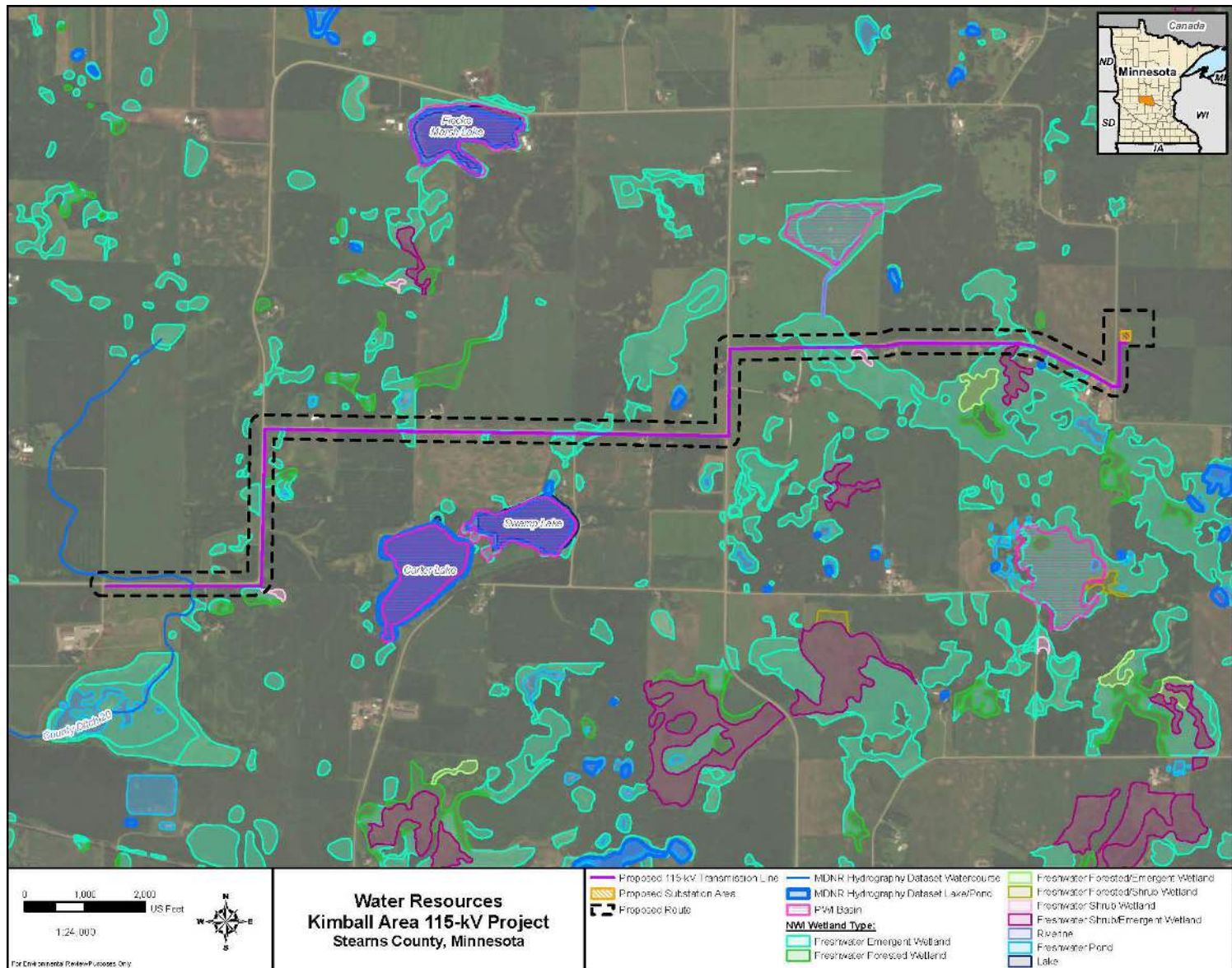
Route permits issued by the Commission typically contain the avoidance and minimization measures relevant to vegetation, including minimizing the number of trees to be removed, developing a vegetation management plan, and minimizing the spread of noxious weeds.

6.8.8. Surface Waters and Wetlands

Hydrologic features in the Project Area and along the Proposed Route are shown on the Detailed Maps in **Appendix B**. Lakes, rivers, wetlands, and floodplains perform essential functions within a landscape, including flood attenuation, groundwater recharge, and water quality protection. They also provide wildlife habitat. The Project lies within the Mississippi River – St. Cloud watershed, Mississippi Headwaters portion of the Mississippi River Basin.¹⁰⁸ No floodplains are mapped within the Proposed Route. Water resources are depicted on **Figure 17**.

¹⁰⁸ Minnesota Department of Natural Resources. 2025. *Minnesota's watershed basins*. Available at: <https://www.dnr.state.mn.us/watersheds/map.html>. Accessed March 2026.

Figure 17 Water Resources



6.8.8.1. Surface Waters

The Applicants reviewed MDNR hydrography data along with aerial and topographic maps to determine if there are lakes or ponds in the Proposed Route (Minnesota Geospatial Commons, 2025d). No streams, lakes or ponds are crossed by the Project; as such, public watercourses or basins are not located within the Proposed Route.¹⁰⁹ The transmission line will cross County Ditch #20 at approximate milepost (MP) 0.25 (**Appendix B**, page 1). This ditch is not identified on the Minnesota Buffer Protection Map.

Section 303(d) of the Federal Clean Water Act requires states to publish, every 2 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 authority over determining 303(d) waters. MPCA’s 2024 list was approved by the USEPA in April 2024. Based on this list, there are no impaired waters crossed by the Proposed Route.

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 under Section 404 of the Clean Water Act. In Minnesota, wetlands are also protected under the WCA.

The USFWS produced maps of wetlands based on aerial photographs and NRCS soil surveys starting in the 1970s. This effort is referred to as the National Wetland Inventory (NWI). NWI data were further updated for the state of Minnesota through a multi-agency effort led by the MDNR and were published in 2019.¹¹⁰ Although wetlands identified by the Minnesota NWI might be inconsistent with current wetland conditions, Minnesota NWI data are the most accurate and readily available database of wetland resources within Minnesota and were used to identify wetlands occurring within the Proposed Route.

The Proposed Route contains discrete wetland communities.¹¹¹ Wetlands within the Proposed Route are identified in **Table 28** and shown in **Appendix B**. Wetlands Crossed by the Proposed Alignment are shown in **Table 29**. There are no public water wetlands within the Proposed Route.

¹⁰⁹ Minnesota Department of Natural Resources. 2025. *Public Waters Inventory (PWI) Maps*. Available at: https://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html. Accessed March 2026.

¹¹⁰ Minnesota Department of Natural Resources. 2025. *National Wetlands Inventory Update*. Available at: https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html. Accessed March 2026.

¹¹¹ Minnesota Geospatial Commons. 2025. *National Wetland Inventory for Minnesota*. Available at: <https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014>. Accessed March 2026.

Table 28 Wetlands within the Proposed Route

Cowardin Type	Description	Number	Acres
PEM1A Palustrine Emergent, Persistent Temporarily Flooded	Emergent	8	6.41
PEM1Ad Palustrine Emergent, Persistent Temporarily Flooded Partly Drained/Ditched	Emergent	7	7.62
PEM1Af Palustrine Emergent, Persistent Temporarily Flooded Farmed	Emergent	4	1.08
PEM1C Palustrine Emergent, Persistent Seasonally Flooded	Emergent	7	5.51
PEM1D Palustrine Emergent, Persistent Continuously Saturated	Emergent	2	0.33
PFO1A Palustrine Forested, Persistent Temporarily Flooded	Forested	3	0.33
PSS1/EM1C Palustrine Scrub-Shrub/Emergent, Persistent Seasonally Flooded	Shrub/ Emergent	1	0.49
PSS1A Palustrine Scrub Shrub Temporarily Flooded	Shrub	2	0.60
TOTAL*		34	22.37
* Acres do not add to total due to rounding.			

Table 29 Wetlands Crossed by the Proposed Alignment

Cowardin Type	Description	Length (ft)
PEM1A	Freshwater Emergent Wetland	904.2
PEM1Ad	Freshwater Emergent Wetland	1012.3
PEM1C	Freshwater Emergent Wetland	841.6
PEM1D	Freshwater Emergent Wetland	72.2
TOTAL		2830.3

Calcareous Fens, Karst, and Springs

No calcareous fens, karst, or springs are within the Proposed Route. The nearest calcareous fen is 5.06 miles from the Proposed Alignment; the nearest spring is 2.4 miles from the Proposed Alignment. There are no mapped karsts within Stearns or Meeker counties.¹¹²

¹¹² Minnesota Department of Natural Resources. n.d. *Karst Feature Inventory*. Available at: <https://gis.dnr.state.mn.us/arcgis/apps/experiencebuilder/experience/?id=4cc5f9b43b654651baaaabb32704ba24>. Accessed August 2026.

6.8.8.2. Potential Impacts

The ROI for Surface Waters and Wetlands is the Proposed Route. Impacts will generally be of a small size, short term and minimal; however, tree clearing within wetlands could occur resulting in permanent conversion of wetland type. Potential impacts can be mitigated in part.

There are no lakes or streams crossed by the Proposed Route. County Ditch #20 can be spanned, and direct impacts will not occur. Access roads over or across surface waters and wetlands is not anticipated for construction or operation of the Project. The Kimball Substation will be constructed in an upland area and will not impact surface waters or wetlands.

Structures will need to be placed in wetlands if the wetland complex is greater than 500 feet across. Based on the Proposed Alignment, Great River Energy anticipates that up to four structures might be placed in non-delineated NWI wetlands. Permanent impacts to wetlands will occur where a structure is in the wetland, resulting in approximately 18 to 60 inches in diameter of permanent impact per structure.

Existing trees will be removed throughout the Proposed ROW for the safe and reliable operation of the transmission line. After clearing, vegetation maintenance procedures within the ROW generally prohibit the reestablishment of tall growing woody vegetation. The Proposed ROW crosses 0.32 acre of forested wetland that could require clearing; therefore, limited conversion of this wetland type could occur. These impacts would be permanent. Additionally, some clearing may also occur at PEM1Ad wetland at approximately MP 1.4 where the Proposed Alignment is adjacent to these wetlands.

Indirect impacts to surface waters can occur from erosion and stormwater runoff. Runoff from rain events and snow melt has the potential to carry sediment and pollutants to surface waters and groundwater. Vegetation removal and earth moving during construction activities can exacerbate stormwater runoff concerns. Stormwater management is regulated by the MPCA “to limit stormwater runoff and reduce pollution from stormwater.”¹¹³

Construction and operation of the Project is not anticipated to cause a water to be newly listed as impaired. There is limited potential to increase turbidity due to sedimentation from construction activities because of the distance to any receiving waters.

6.8.8.3. Mitigation Measures

The Applicants will implement their Vegetation Management Plan (see draft in **Appendix I**) during construction and operation of the Project. Great River Energy will implement impact avoidance measures during design and construction of the transmission line include spacing and placing the pole structures at variable distances to span and avoid wetland if possible. Once construction of the Project is complete, Great River Energy will restore disturbed areas within wetlands to pre-construction conditions.

¹¹³ Minnesota Pollution Control Agency. 2025. *Stormwater Permits*. Available at: <https://www.pca.state.mn.us/business-with-us/stormwater-permits>. Accessed October 2025.

Additionally, erosion and sediment BMPs will be used to mitigate the potential for sediments or other pollutants to reach surface waters. The Applicants and their contractors will employ erosion and sediment control BMPs near all wetland crossings to minimize runoff during construction. BMPs could include but are not limited to the installation of sediment barriers (e.g., silt fence, straw bales, bio-logs), filter socks, mulch, upslope diversions, and slope breakers.

To minimize compaction and rutting within wetlands, 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 wetlands. Additionally, low ground pressure construction vehicles may be used, which are designed to minimize impacts on soils in damp areas. Construction crews will attempt to access wetlands with the least amount of physical impact on the wetlands. Staging or stringing setup areas will not be placed within or adjacent to water resources to the extent practicable.

As described in **Section 5.1.5**, the restoration contractor will take measures to alleviate soil compaction where needed.

As described in **Section 2.4.1**, Great River Energy, in consultation with the USACE, St. Paul District, will review the Project for coverage under the Utility Regional General Permit once design of the transmission line is complete, and seek coverage if needed.

6.8.8.4. Typical Route Permit Conditions

- Route permits issued by the Commission typically include conditions related to spill prevention, erosion and sediment control, wetland protection, and restoration of disturbed areas, and these requirements would also be protective of water quality and water-dependent resources. Route permits also typically contain avoidance and minimization measures relevant to wetlands and other water resources. For example, structure placement should avoid wetlands where practicable, and construction in wetlands should occur during frozen conditions or using matting. Permittees are also required to restore wetlands after construction in accordance with applicable permits and legal requirements.

6.8.9. Groundwater

The MDNR divides Minnesota into six groundwater provinces. The Project is in the Central Province, which is “characterized by buried sand aquifers and relatively extensive surficial sand plains, part of a thick layer of sediment deposited by glaciers overlying the bedrock.” It is underlain by sedimentary bedrock with good aquifer properties.¹¹⁴ Groundwater availability in the Central Province is rated as “good” in surficial sands, “moderate” in buried sands, and “limited” in bedrock.

¹¹⁴ Minnesota Department Natural Resources. 2001. *Minnesota Ground Water Provinces*. Available at: https://www.dnr.state.mn.us/waters/groundwater_section/mapping/provinces.html. Accessed March 2026.

The MDH enforces the federal Safe Drinking Water Act, including the National Primary Drinking Water Regulations created under the Safe Drinking Water Act.¹¹⁵ The Project is not located within the boundaries of any Drinking Water Supply Management Areas or Wellhead Protection Areas.¹¹⁶

The County Well Index (CWI) is a database that contains subsurface information for over 533,000 water wells drilled in Minnesota. CWI is maintained by the Minnesota Geological Survey (MGS) in partnership with the MDH. The data are derived from well contractors' logs of geologic materials encountered during drilling and later interpreted by geologists at the MGS.¹¹⁷ The CWI indicates that there are two wells located within the Proposed Route. Wells within the Proposed Route are identified in **Table 30**. The average depth to water level is 33.5 feet.

Table 30 CWI Wells within the Proposed Route

Unique ID	Within Proposed ROW	Surface Elevation	Static Water Elevation	Static Water Level (Depth to Water) Feet	Status	Use
00138820	N	1209	1174	35	Active	Domestic
00426050	N	1222	1190	32	Active	Domestic

According to the Minnesota Water Table Aquifer Vulnerability data developed by MDA, MDH, and MDNR, and groundwater sensitivity within the Proposed Route is rated as high. This rating is based on the underlying geomorphology and the presence of sand and gravel. A rating of “high” means that “water moving vertically will reach the aquifer within hours to years.”¹¹⁸

6.8.9.1. Potential Impacts

The ROI for Groundwater is the Proposed Route. Potential impacts are anticipated to be short term and of a small size. Potential impacts can be mitigated.

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. The Applicants do not expect to exceed this permitting threshold; however, if higher groundwater levels are expected to occur, the Applicants could obtain coverage under the MDNR's Temporary Projects General Permit No. 1997-0005, which authorizes temporary water appropriation for construction dewatering. Any effects on water tables will be localized and short term and will not result in significant impacts to hydrologic resources.

¹¹⁵ Minnesota Department of Health. 2026. *Laws and Rules. Drinking Water and Source Water Protection Programs*. Available at: <https://www.health.state.mn.us/communities/environment/water/rules/index.html>. Accessed March 2026.

¹¹⁶ Minnesota Department of Health. 2026. *Arc-GIS- Drinking Water Supply Management Areas or Wellhead Protection Areas*. Available at: <https://mdh.maps.arcgis.com/apps/View/index.html?appid=8b0db73d3c95452fb45231900e977be4>. Accessed March 2026.

¹¹⁷ Minnesota Geological Survey. 2026. *County Well Index*. Available at: <https://cse.umn.edu/mgs/cwi>. Accessed March 2026.

¹¹⁸ Minnesota Department of Agriculture. 2016. *Minnesota Water Table Aquifer Vulnerability*. Available at: https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mda/water_aquifer_vulnerability/metadata/metadata.html#Metadata_Reference_Information. Accessed March 2026.

6.8.9.2. Mitigation Measures

The Applicants will comply with all laws applicable to the generation, storage, transportation, clean up and disposal of all waste generated during construction and restoration of the Project. Great River Energy will request well information from landowners along the transmission line once a final route is selected, and will coordinate with landowners regarding well access, as needed. No additional mitigation is proposed.

6.8.9.3. Typical Route Permit Conditions

Route permits issued by the Commission typically include conditions related to spill prevention, erosion and sediment control, wetland protection, and restoration of disturbed areas, and these requirements would also be protective of groundwater quality and groundwater-dependent resources.

6.8.10. Wildlife and Habitat

The Project is in the MDNR Nongame Wildlife Central Region. This region is within the Mississippi Flyway region, which is an “important migratory corridor for at least 325 different species of birds.”¹¹⁹

The landscape within the Local Vicinity of the Project is rural and dominated primarily by agricultural land with interspersed patches of wetlands and woodlots. The Proposed Route parallels existing roadways for its entire length, except where it will turn into the Kimball Substation. The Proposed Route also follows distribution rights-of-way. In addition to agricultural land, other land cover types are present within the Proposed Route include wetlands, wooded (deciduous and coniferous) areas, hay/pasture land, and maintained residential/farmland and commercial land.

These habitats are likely to be utilized by the following common wildlife species, which are considered generalist species that can tolerate human activity: white-tailed deer (*Odocoileus virginianus*), North American raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), meadow vole (*Microtus drummondii*), common deer mouse (*Peromyscus maniculatus*), American toad (*Anaxyrus americanus*), and common garter snake (*Thamnophis sirtalis*). Additionally, some pollinator species (e.g., bees, butterflies, and moths) may be present within the Proposed Route.

There are no MDNR Wildlife Management Areas or Aquatic Management Areas crossed by the Proposed Route. There are no MDNR-designated Lakes of Biological Significance, Public Water Inventory (PWI) basins or waterways, Calcareous Fens, Wild Rice Lakes, Trout Lakes, Trout Streams, Outstanding Resource Waters or Priority Shallow Lakes within the Proposed Route.

Rare and natural flora and fauna are discussed in **Section 6.8.5**.

¹¹⁹ Minnesota Department of Natural Resources. 2026. *Nongame Wildlife - Central Region*. Available at: <https://www.dnr.state.mn.us/eco/nongame/central.html>. Accessed March 2026.

Avian Species

Avian species that are habitat generalists expected to be within the Local Vicinity include the American crow (*Corvus brachyrhynchos*), mourning dove (*Zenaida macroura*), field sparrow (*Spizella pusilla*), turkeys and other upland birds, and songbirds. The red-winged blackbird (*Agelaius phoeniceus*) and common yellowthroat (*Geothlypis trichas*) may use wetland habitats within the Local Vicinity along with ducks, geese, swans, and other waterbirds. The red-tailed hawk (*Buteo jamaicensis*) and other raptors may utilize wooded areas for roosting and nesting and agricultural fields for hunting. The Project is within a migratory corridor for many species of birds. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S. Code 703-711), which prohibits the taking of any migratory bird and their nests, eggs, or products.

Bald and golden eagles (*Haliaeetus leucocephalus*; *Aquila chrysaetos*) are protected by both the MBTA and the BGEPA. The BGEPA prohibits the take of a bald or golden eagle adults, juveniles, or chicks including their parts, nests, or eggs without a permit. Take is defined by the BGEPA as to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. The BGEPA also addresses impacts resulting from human-induced alterations occurring around previously used nesting sites.

"Minnesota has the third largest Bald eagle breeding population, following Alaska and Florida."¹²⁰ Bald eagles are likely present in Minnesota year-round; the species overwinters near the Mississippi River in Wabasha and Red Wing, and breeds and nests in northeastern and north central Minnesota. The species is primarily found near rivers, lakes, marshes, and other waterbodies where opportunities to fish are plentiful. Bald eagles nest in tall trees with clear lines of sight and large sturdy branches for perching and nest building. Suitable habitat for Bald eagles is present within 2 miles of the Project. In addition to the protections the MBTA and BGEPA provide, the USFWS has also developed a list of Birds of Conservation Concern (BCC). BCC are migratory and non-migratory bird species that "are not yet at risk of severe decline or extinction" but are nevertheless in decline.¹²¹ The program fosters proactive conservation actions by federal and state agencies and private parties by drawing attention to these species. The USFWS IPaC tool identified 12 BCC species that may be present in the Local Vicinity. These species are identified in **Table 31**.

In addition, the U.S North American Bird Conservation Initiative has developed Bird Conservation Regions (BCRs) to "facilitate domestic and international cooperation in bird conservation."¹²² Each BCR has a list of birds present or possibly present within the region that are considered BCCs. The Project is located within the Prairie Hardwood Transition Bird Conservation Region.

¹²⁰ Minnesota Department of Natural Resources. 2026. *Rare Species Guide: Haliaeetus leucocephalus*. Available at: <https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ABNKC10010>. Accessed April 2026.

¹²¹ Pacific Birds Habitat Joint Venture. 2024. *Breaking Down "Birds of Conservation Concern."* Available at: <https://pacificbirds.org/2024/06/birds-of-conservation-concern/>. Accessed April 2026.

¹²² North American Bird Conservation Initiative. 2026. *Bird Conservation Regions*. Available at: <https://nabci-us.org/resources/bird-conservation-regions-map/>. Accessed April 2026.

Table 31 Birds of Conservation Concern Potentially Present in the Local Vicinity

BCR	Listed Birds ¹²³	
	Common Name ^a	Scientific Name
23 (Prairie Hardwood Transition)	Bald Eagle	<i>Haliaeetus leucocephalus</i>
	Black Tern	<i>Chlidonias niger</i>
	Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>
	Bobolink	<i>Dolichonyx oryzivorus</i>
	Grasshopper Sparrow	<i>Ammodramus savannarum</i>
	Henslow's Sparrow	<i>Centronyx henslowii</i>
	Lesser Yellowlegs (nb)	<i>Tringa flavipes</i>
	Pectoral Sandpiper (nb)	<i>Calidris melanotos</i>
	Rusty Blackbird (nb)	<i>Euphagus carolinus</i>
	Semipalmated Sandpiper (nb)	<i>Calidris pusilla</i>
	Western Grebe	<i>Aechmophorus occidentalis</i>
	Wood Thrush	<i>Hylocichla mustelina</i>
^a (nb) non-breeding in this BCR. The listed birds are a subset of birds within BCR 23 that may be present in the Local Vicinity, according to USFWS's IPaC review. Although the birds are known to the Local Vicinity, suitable breeding habitat is not present.		

There are no USFWS Waterfowl Production Areas or National Audubon Society Important Bird Areas within the Local Vicinity. Two PWI shallow open water basins are south of Project within the Local Vicinity. The Alice Hamm WMA and several MDNR Regionally Significant Ecological Areas are also within the Local Vicinity. These areas provide suitable habitat for avian species.

6.8.10.1. Potential Impacts

The ROI for Wildlife and Habitat is the Proposed Route, except that the ROI for avian species is the Local Vicinity. Potential impacts are anticipated to be short and long term. Impacts will be of a small size and not affect unique resources.

Wildlife species, including avian species, are expected to be displaced during construction due to the increased presence of human activity. However, less mobile individuals, might be struck or killed during construction. Such occurrences will not impact local population levels. While the potential for permanent displacement exists, most species will return to the Proposed Route after construction activities stop.

Marginal habitats impacted by the transmission line are primarily maintained land associated with agricultural row crops and field edges and road and distribution line rights-of-way. Wildlife species that use this type of habitat are mobile species accustomed to regular disturbance. These habitat generalists can displace to adjacent or similar habitat nearby. The substation location is within an agricultural field, as such, intermittent feeding areas will be lost to certain wildlife species depending upon the crop grown.

¹²³ Listed birds are derived from the USFWS's IPaC tool review generated March 23, 2026. See Agency Correspondence Appendix.

During operation of the Project, impacts are expected to be negligible. Wildlife in the area are already accustomed to utility infrastructure along roads. While less mobile species will be more prone to impacts, maintenance activities already occur in this area (road and distribution line maintenance such as mowing) and future impacts from the Project will be incremental. Impacts to wildlife and their habitat are not expected to result in significant changes to wildlife species present in the Proposed Route or their use of the Proposed ROW.

Because the transmission line parallels existing road rights-of-way for >99 percent its length, habitat fragmentation will not occur. In some instances, incremental increases to habitat edge effects might occur in areas where trees are cut. These areas, however, are generally associated with human development.

Avian Species

In addition to the impacts above, avian electrocution or collisions could occur during operation of the Project. 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. Several ponds exist within the Local Vicinity, potentially increasing this potential.

Work conducted within 660 feet of an active eagle nest during the nesting season may disturb nesting eagles to such a degree that adults abandon the nest, resulting in take of eggs and/or chicks; an active nest is one where eggs or chicks are present. In Minnesota, the bald eagle nesting season is generally January 15 to August 15.¹²⁴

6.8.10.2. Mitigation

As designed, the Project avoids or otherwise minimizes impacts to wildlife and their habitats by paralleling existing road rights-of-way and, in most locations, existing distribution line rights-of-way. Adjacent habitat similar or equal to and of higher value is available for displaced species within the Local Vicinity.

Great River Energy will design the transmission line in accordance with APLIC standards to reduce the potential for avian electrocutions or collisions with transmission lines.

The Applicants reviewed aerial imagery and determined that suitable habitat for bald eagle activity, nesting, foraging, and winter roosts are present within the two miles of the Proposed Route. The Applicants will work with the USFWS to comply with BGEPA and ensure that Project activities do not result in unauthorized take of eagles. The Applicants will work with USFWS and MDNR 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 and electrocution to the extent practical.

If construction activities will take place in suitable eagle nesting habitat during the species nesting season, surveys to identify active nests within 660 feet of work areas will be conducted in early

¹²⁴ U.S. Fish and Wildlife Service. 2026. *Bald and Golden Eagle Protection Act*. Available at: <https://www.fws.gov/law/bald-and-golden-eagle-protection-act>. Accessed March 2026.

spring (i.e., late March/early April) of the year of construction. If active nests are identified within the disturbance buffer, the Applicants will consult with the USFWS to determine next steps and develop appropriate avoidance and minimization measures.

Additional mitigation is not proposed.

6.8.10.3. Typical e Route Permit Conditions

- Route permits issued by the Commission typically contain measures to reduce impact on wildlife. For example, route permits typically require permittees to coordinate with MDNR regarding bird flight diverters and use erosion control materials that reduce wildlife impact.

6.9. Unavoidable Impacts

Minn. State. § 216I.05, subd. 4(a)(9), requires that an application include “a list that identifies human and natural environmental effects that are unavoidable if the facility is approved at a specific site or route.” The Project will be designed, constructed, and operated in manner that mitigates potential impacts to the greatest extent possible. However, even with mitigation measures, there will be impacts that cannot be avoided. These impacts are distinct based on the phase of the Project: construction or operation.

Unavoidable impacts associated with construction could include:

- Fugitive dust emissions on and near gravel roads.
- Greenhouse gas emissions.
- Incremental vegetative clearing.
- Minimal amounts of habitat loss.
- Noise disturbances and visual impacts.
- Soil compaction and erosion.
- Short-term traffic delays.
- Temporary construction dewatering.
- Temporary disturbance and displacement of wildlife; impacts to individual wildlife.

Unavoidable impacts associated with operation could include:

- Continued maintenance of tall growing woody vegetation.
- Conversion of agricultural land at structure locations and the Kimball Substation location.
- Incremental increase in the potential for avian collisions or electrocution.
- Interference with AM radio signals.
- Limited GHG emissions.
- Visual changes to the landscape.

6.10. Irreversible and Irretrievable Impacts

Minn. State. § 216I.05, subd. 11(b)(11), requires the Commission to consider “irreversible and irretrievable commitments of resources” when determining whether to issue a Route Permit. “Resource commitments are irreversible when it is impossible or very difficult to redirect that resource to a different future use; an irretrievable commitment of resources means the resource is not recoverable for later use by future generations.”¹²⁵

Irreversible resource commitments associated with the Project will include the land use associated with the Kimball Substation and transmission line components. While the land underlying the Kimball Substation could be restored to agricultural use and certain Project components could be reused or recycled, this is unlikely to happen in the reasonably foreseeable future.

Irretrievable resource commitments associated with the Project are related to construction activities. The use of aggregate, concrete, fuel, human labor, steel, water, wood, and other consumable resources is irretrievable. Funding could be irretrievable in part.

6.11. Cumulative Impacts

Minn. R. 4410.0200, subp. 11(a), defines “cumulative potential effects” as the “effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects.”

Department of Commerce Energy Environmental Review and Analysis documents have previously defined “environmentally relevant area” to mean “locations where the potential effects of the project coincide with the potential effects of other projects to impact the elements studied in this EA. Generally, this area includes the ROI for the different resource elements.”¹²⁶

The Applicants searched for reasonably foreseeable projects in both temporal and spatial proximity to the Proposed Project. No projects were identified in the Minnesota EQB interactive project viewer.¹²⁷ MnDOT¹²⁸ and Meeker County¹²⁹ do not have construction projects planned in the environmentally relevant area. Stearns County will reconstruct 5 miles of County Road 2 in

¹²⁵ Minnesota Department of Commerce. 2021. Environmental Assessment: Frazee to Erie Transmission Line Project. Available at: <https://apps.commerce.state.mn.us/cera/web/project-file/11849>. Accessed April 2026.

¹²⁶ *Ibid.*

¹²⁷ Minnesota Environmental Quality Board. n.d. *Environmental Review Project*. Available at: <https://pca-gis02.pca.state.mn.us/EQB/>. Accessed April 2026.

¹²⁸ Minnesota Department of Transportation. 2026. *Construction projects, plans, and studies*. Available at: <https://www.dot.state.mn.us/roadwork>. Accessed April 2026.

¹²⁹ Meeker County. 2024. *Meeker County 5-Year Highway Construction Plan*. Available at: <https://www.co.meeker.mn.us/DocumentCenter/View/7251/5-Year-Highway-Construction-Plan-PPT-071624>. Accessed April 2026.

2028.^{130, 131} County Road 2 is about 1 mile west of the transmission line. This project should be completed prior to the start of construction for the transmission line and substation.

The Minnesota Energy Connection 345-kV Transmission Line Project was permitted by the MPUC on June 11, 2025.¹³² The permitted route travels through the environmentally relevant area approximately 3,000 feet south of the eastern side of the transmission line. Construction is scheduled to begin in Q2 2026 and, like the Project, will move along the ROW as it is constructed. Construction might or might not occur in the environmentally relevant area at the time the transmission line and substation are being constructed, nevertheless, this project is reasonably foreseeable.

Resource elements that might be impacted within the environmentally relevant area are those outside the Local Vicinity in the Project Area and county. These resource elements include air quality, archeological and historic resources, climate change and resilience, cultural resources, emergency services, environmental justice, greenhouse gas emissions, public services, rare and unique species, and socioeconomics.

Cumulative potential effects on human settlement are anticipated to be minimal. The census tract crossed by the Project is not within an area of Environmental Justice concern; therefore, potential impacts is not expected to these communities. The Project will not interfere with the work and leisure pursuits of residents; however, the Project will impact the sense of place in the environmentally relevant area possibly resulting in impacts for some individuals. Impacts to emergency and public services are not expected as the Project will prioritize emergency response and are not expected to impact public services. Socioeconomic impacts will be positive.

Cumulative potential effects to the natural environment include increased potential for fugitive dust emissions as well as increased greenhouse gas emissions. Greater potential exists for impacts to archeological and historic resources; however, survey is expected to occur minimizing this potential. Rare and unique resources could be impacted.

¹³⁰ Stearns County. 2025. *Road Program Map 2026 to 2030*. Available at: <https://www.stearnscountymn.gov/560/Road-Construction>. Accessed April 2026.

¹³¹ Stearns County. 2025. *Five-Year Road Improvement Program*. Available at: <https://www.stearnscountymn.gov/560/Road-Construction#docaccess-cda50d9473f6cdc2ad5aa46d046296af479e0e3323b099bb6fb682f1350a67b3>. Accessed April 2026.

¹³² Minnesota Public Utilities Commission. 2025. *Order Modifying and Adopting Administrative Law Judge Report, Granting Certificate of Need, and Issuing Route Permit for the Minnesota Energy Connection Project*. Available at: <https://efiling.web.commerce.state.mn.us/documents/%7B70975F97-0000-CC13-8ED7-DDCF9A596A16%7D/download?contentSequence=0&rowInde>. Accessed April 2025.

7. REFERENCES

- Boerboom et al., 1995. Boerboom, T. J., D. R. Setterholm, and V. W. Chandler. 1995. *Bedrock Geology. County Atlas Series, Atlas C-10, Part A. Plate 2 – Bedrock Geology*. Available at: <https://conservancy.umn.edu/server/api/core/bitstreams/845d5f14-cac7-437e-860e-41e157ec932c/content>.
- Canadian Pacific Kansas City Railroad. 2026. *Connecting a Continent*. Available at: <https://www.cpkcr.com/en/our-advantage/connecting-a-continent>.
- Center for Hearing and Communication. 2025. *International Noise Awareness Day. Common Noise Levels – How Loud is Too Loud?* Available at: <https://noiseawareness.org/info-center/common-noise-levels/>.
- CentraCare. 2026. *CentraCare – Paynesville Hospital*. Available at: <https://www.centracare.com/locations/profile/paynesville-hospital/>.
- Chalmers, J. 2012. *Transmission Line Impacts on Rural Property Value*. Rights of Way. May/June.
- City of Kimball. 2026. *Fire Department*. Available at: <https://www.ci.kimball.mn.us/fire>.
- City of Watkins. 2026. *City Services and Other Utilities*. Available at: <http://www.cityofwatkins.com/city-services-and-other-utilities.html>.
- City of Watkins. 2026. *Fire Department*. Available at: <http://www.cityofwatkins.com/fire-department.html>.
- City of Watkins. 2026. *Recreation – Kraut N’ Wurst Days*. Available at: <http://www.cityofwatkins.com/kraut-n-wurst-days.html>.
- City of Watkins. 2026. *Watkins Ambulance Service*. Available at: <http://www.cityofwatkins.com/ambulance.html>.
- Climate Mapping for Resilience and Adaptation. 2026. Available at: *Climate Mapping for Resilience and Adaptation v2.0*. Available at: <https://livingatlas.arcgis.com/assessment-tool/explore/details>.
- Code of Federal Register. 2026. *Identification of Important Farmland*. Available on-line at: <https://www.ecfr.gov/current/title-7/subtitle-B/chapter-VI/subchapter-F/part-657/subpart-A/section-657.5>.
- Great River Energy. 2024. *A Continued Focus on Reliability*. Available at: <https://greatriverenergy.com/transmission/a-continued-focus-on-resiliency/>.
- Kinnard, W. and Dickey, SA. 1995. *A Primer on Proximity Impact Research: Residential Values Near High Voltage Transmission Lines*. Available at: <https://cre.org/wp-content/uploads/1995/04/Real-Estate-Issues-April-1995-4.pdf>.

- Meeker County Strategic Plan. 2025. *Sowing the Seeds of our Future*. Available at:
<https://www.co.meeker.mn.us/DocumentCenter/View/7857/2025-2027-Strategic-Plan>.
- Meeker County. 2007. *Comprehensive Future Land Use Map*. Available at:
<https://www.co.meeker.mn.us/DocumentCenter/View/3124/Comprehensive-Land-Use-Plan--Future-Land-Use-Map-9Apdf>.
- Meeker County. 2024. *Meeker County 5-Year Highway Construction Plan*. Available at:
<https://www.co.meeker.mn.us/DocumentCenter/View/7251/5-Year-Highway-Construction-Plan-PPT-071624>.
- Meeker County. December 2024. *Meeker County Land Development Ordinances, Section 11.00*. Available at:
https://library.municode.com/mn/meeker_county/codes/land_development_ordinance?nodeId=LADER_PTIVZOR_ART11AGPRDI_S11.00IN.
- Minnesota Department Natural Resources. 2001. *Minnesota Ground Water Provinces*. Available at:
https://www.dnr.state.mn.us/waters/groundwater_section/mapping/provinces.html.
- Minnesota Department of Administration State Archaeologist. 2025. *Office of the State Archaeologist Portal*. Available at:
<https://osaportal.gisdata.mn.gov/>.
- Minnesota Department of Agriculture. 2023. *Organic Farm Directory by County*. Available at:
<https://www.lrl.mn.gov/docs/2023/other/231687.pdf>.
- Minnesota Department of Agriculture. 2016. *Minnesota Water Table Aquifer Vulnerability*. Available at:
https://resources.gisdata.mn.gov/pub/gdrs/data/pub/us_mn_state_mda/water_aquifer_vulnerability/metadata/metadata.html#Metadata_Reference_Information.
- Minnesota Department of Agriculture. 2026. *Minnesota Apiary Registry*. Available at:
<https://mn.beecheck.org/map>.
- Minnesota Department of Agriculture. 2026. *Noxious and Invasive Weeds*. Available at:
<https://www.mda.state.mn.us/plants-insects/noxious-invasive-weeds>.
- Minnesota Department of Commerce. 2021. *Environmental Assessment: Frazee to Erie Transmission Line Project*. Available at:
<https://apps.commerce.state.mn.us/eera/web/project-file/11849>.
- Minnesota Department of Commerce. 2025. *Environmental Assessment: Laketown 115 kV Transmission Line Project*. Available at:
<https://puc.eip.mn.gov/sites/default/files/2025-05/Laketown%20115%20kV%20Transmission%20Line%20Project%20Environmental%20Assessment.pdf>.
- Minnesota Department of Commerce. 2026. *Minnesota Telephone Exchange Boundaries*. Available at:
<https://experience.arcgis.com/experience/b1a26b60ce9141aa86c4cb7391bb8940>.

Minnesota Department of Employment and Economic Development. 2024. *Economic Development Region 6E: Southwest Central, 2024 Regional Profile*. Available at: https://mn.gov/deed/assets/2024_EDR6E_RP_tcm1045-133245.pdf.

Minnesota Department of Employment and Economic Development. 2024. *Economic Development Region 7W: Central, 2024 Regional Profile*. Available at: https://mn.gov/deed/assets/2024_EDR7W_RP_tcm1045-133247.pdf.

Minnesota Department of Health. 2026. *Arc-GIS- Drinking Water Supply Management Areas or Wellhead Protection Areas*. Available at: <https://mdh.maps.arcgis.com/apps/View/index.html?appid=8b0db73d3c95452fb45231900e977be4>.

Minnesota Department of Health. 2026. *Laws and Rules. Drinking Water and Source Water Protection Programs*. Available at: <https://www.health.state.mn.us/communities/environment/water/rules/index.html>.

Minnesota Department of Natural Resources. 2025. *Ecological Classification System*. Available at: <https://www.dnr.state.mn.us/ecs/222Ma/index.html>.

Minnesota Department of Natural Resources. 2025. *Minnesota's watershed basins*. Available at: <https://www.dnr.state.mn.us/watersheds/map.html>.

Minnesota Department of Natural Resources. 2025. *National Wetlands Inventory Update*. Available at: https://www.dnr.state.mn.us/eco/wetlands/nwi_proj.html.

Minnesota Department of Natural Resources. 2025. *Public Waters Inventory (PWI) Maps*. Available at: https://www.dnr.state.mn.us/waters/watermgmt_section/pwi/maps.html.

Minnesota Department of Natural Resources. 2026. *Alice Hamm WMA*. Available at: https://www.dnr.state.mn.us/wmas/detail_report.html?id=WMA0143100.

Minnesota Department of Natural Resources. 2026. *Climate Trends*. Available at: https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html.

Minnesota Department of Natural Resources. 2026. *Ecological Classification System. Hardwood Hills Subsection*. Available at: <https://www.dnr.state.mn.us/ecs/222Ma/index.html>.

Minnesota Department of Natural Resources. 2026. *MBS Site Biodiversity Significance Ranks. Minnesota Biological Survey*. Available at: https://www.dnr.state.mn.us/eco/mbs/biodiversity_guidelines.html.

Minnesota Department of Natural Resources. 2026. *Minnesota Climate Trends*. Available at: <https://arcgis.dnr.state.mn.us/ewr/climatetrends>.

Minnesota Department of Natural Resources. 2026. *Minnesota's Native Plant Communities*. Available at: <https://www.dnr.state.mn.us/npc/index.html>.

Minnesota Department of Natural Resources. 2026. *MN TOPO*. Available at: <https://mntopo.dnr.state.mn.us/>.

- Minnesota Department of Natural Resources. 2026. *Nongame Wildlife - Central Region*. Available at:
<https://www.dnr.state.mn.us/eco/nongame/central.html>.
- Minnesota Department of Natural Resources. 2026. *Rare Species Guide: Haliaeetus leucocephalus*. Available at:
<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ABNKC10010>.
- Minnesota Department of Natural Resources. n.d. *Karst Feature Inventory*. Available at:
<https://gis.dnr.state.mn.us/arcgis/apps/experiencebuilder/experience/?id=4cc5f9b43b654651baaaabb32704ba24>.
- Minnesota Department of Natural Resources. n.d. *Minnesota & Northeast Iowa Morainal Section*. Available at:
<https://www.dnr.state.mn.us/ecs/222M/index.html>.
- Minnesota Department of Natural Resources. n.d. *Minnesota Conservation Explorer*. Available at:
<https://mce.dnr.state.mn.us/>.
- Minnesota Department of Public Safety. 2026. *Emergency Communications Networks – Allied Radio Matrix for Emergency Response (ARMER)*. Available at:
<https://dps.mn.gov/node/622>.
- Minnesota Department of Transportation. 2025. *Traffic Count*. Available at:
<https://mndot.public.ms2soft.com/tcds/tsearch.asp?mod=tcds>.
- Minnesota Department of Transportation. 2026. *Construction projects, plans, and studies*. Available at:
<https://www.dot.state.mn.us/roadwork>.
- Minnesota Department of Transportation. 2026. *Materials and Road Research. Aggregate Source Information System*. Available at:
<https://www.dot.state.mn.us/materials/aggsource.html>.
- Minnesota Environmental Quality Board. 2026. *Minnesota Environmental Assessment Worksheet Guidance: Developing a Carbon Footprint and Incorporation Climate Adaptation and Resilience June 2024*. Available at:
<https://www.eqb.state.mn.us/environmental-review/guidance-practitioners/environmental-assessment-worksheet-eaw-guidance>.
- Minnesota Environmental Quality Board. n.d. *Environmental Review Project*. Available at:
<https://pca-gis02.pca.state.mn.us/EQB/>.
- Minnesota Geological Survey. 2026. *County Well Index*. Available at:
<https://cse.umn.edu/mgs/cwi>.
- Minnesota Geospatial Commons. 2025. *National Wetland Inventory for Minnesota*. Available at:
<https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014>.
- Minnesota Geospatial Commons. 2026. *State Mineral Leases*. Available at:
<https://gis.data.mn.gov/maps/0d9e0d712c124755933408980351f797>.

- Minnesota Pollution Control Agency. 2015. *A Guide to Noise Control in Minnesota*. Available at: <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>.
- Minnesota Pollution Control Agency. 2023. *MNRISKS: Minnesota statewide screening of health risks from air pollution*. Available at: <https://www.pca.state.mn.us/sites/default/files/aq9-29.pdf>.
- Minnesota Pollution Control Agency. 2023. *Understanding Environmental Justice in Minnesota*. Available at: <https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page?views=EJ-areas>.
- Minnesota Pollution Control Agency. 2023. *Understanding Environmental Justice in Minnesota, MNRISKS Air Pollution Score*. Available at: https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page?views=Air-pollution-score#data_s=id%3AdataSource_17-190fface219-layer-6%3A2992.
- Minnesota Pollution Control Agency. 2025. *GHG emissions and sequestration from 2005 to 2022, by sector*. Available at: <https://data.pca.state.mn.us/views/Greenhousegasemissionsdata/Emissionsbysector2005-2023?%3Aembed=y&%3AisGuestRedirectFromVizportal=y>.
- Minnesota Pollution Control Agency. 2025. *Greenhouse gas emissions in Minnesota 2005-2022*. Available at: <https://www.pca.state.mn.us/sites/default/files/lraq-3sy25.pdf>.
- Minnesota Pollution Control Agency. 2025. *Minnesota Greenhouse Gas Inventory. Minnesota's greenhouse gas emissions and statutory goals*. Available at: <https://data.pca.state.mn.us/views/Greenhousegasemissionsdata/TotalGHGemissionsgoals?%3Aembed=y&%3AisGuestRedirectFromVizportal=y>.
- Minnesota Pollution Control Agency. 2025. *Stormwater Permits*. Available at: <https://www.pca.state.mn.us/business-with-us/stormwater-permits>.
- Minnesota Pollution Control Agency. 2025. *What's in My Neighborhood*. Available at: <https://mpca.maps.arcgis.com/apps/webappviewer/index.html?id=9d45793c75644e05bac197525f633f87>.
- Minnesota Pollution Control Agency. 2026. *Count of annual AQI days by category*. Available at: <https://data.pca.state.mn.us/views/Minnesotaairqualityindex/CountofannualAQIdaysbycategory?%3Aembed=y&%3AisGuestRedirectFromVizportal=y>.
- Minnesota Pollution Control Agency. 2026. *Understanding the air quality index (AQI)*. Available at: <https://www.pca.state.mn.us/air-water-land-climate/understanding-the-air-quality-index-aqi>.
- Minnesota Power Systems Conference Proceedings (University of Minnesota). 2007. *Electromagnetic Compatibility of Active Implantable Medical Devices (AIMD), and their Interaction with High Voltage Power Lines*.
- Minnesota Public Utilities Commission. 2010. *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. Available at:
<https://puc.eip.mn.gov/sites/default/files/2024-01/pdfs/d3de4cba-c74e-4d74-bf9d-7611874eb8fa.pdf>.

Minnesota Public Utilities Commission. 2025. *Order Modifying and Adopting Administrative Law Judge Report, Granting Certificate of Need, and Issuing Route Permit for the Minnesota Energy Connection Project*. Available at:
<https://efiling.web.commerce.state.mn.us/documents/%7B70975F97-0000-CC13-8ED7-DDCF9A596A16%7D/download?contentSequence=0&rowInde>.

Minnesota State Interagency Working Group on EMF Issues. 2002. *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*. Available at:
<https://apps.commerce.state.mn.us/eera/web/project-file?legacyPath=/opt/documents/EMF%20White%20Paper%20-%20MN%20Workgroup%20Sep%202002.pdf>.

National Archives. 2026. *Code of Federal Regulations. Table A-1 to Subpart A of Part 98 – Global Warming Potentials, 100-Year Time Horizon*. Available at:
<https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-98/subpart-A/appendix-Table%20A-1%20to%20Subpart%20A%20of%20Part%2098>.

National Institute of Environmental Health Sciences (NIEHS). 2025. *Electric & Magnetic Fields*. Available at:
<http://www.niehs.nih.gov/health/topics/agents/emf/>.

National Research Council Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems. 1997. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*. National Academies Press. Available at:
<https://pubmed.ncbi.nlm.nih.gov/25121270/>.

North American Bird Conservation Initiative. 2026. *Bird Conservation Regions*. Available at:
<https://nabci-us.org/resources/bird-conservation-regions-map/>.

North American Electric Reliability Corporation. (n.d.) *FAC-003-05 Transmission Vegetation Management*. Available at:
<https://www.nerc.com/globalassets/standards/reliability-standards/fac/fac-003-5.pdf>.

Office of the Revisor of Statutes. 2024. *2024 Minnesota Statutes. 216B.1691 Renewable Energy Objectives*. Available at:
<https://www.revisor.mn.gov/statutes/cite/216B.1691>.

Pacific Birds Habitat Joint Venture. 2024. *Breaking Down "Birds of Conservation Concern."* Available at:
<https://pacificbirds.org/2024/06/birds-of-conservation-concern/>.

Pitts, J. and Jackson, T. 2007. *Power Lines and Property Values Revisited*. The Appraisal Journal, 75(4):323-325. Available at:
https://www.researchgate.net/publication/316674821_Power_Lines_and_Property_Values_Revisited.

- Robert Kimball & Associates. 2008. *Allied Radio Matrix for Emergency Response (ARMER) Phases 4-5-6 Cost Audit Report submitted to the Department of Public Safety State of Minnesota*. Available at: <https://www.lrl.mn.gov/docs/2009/mandated/090123.pdf>.
- Roddewig, R. and Brigden, C. 2014. *Power Lines and Property Prices*. Real Estate Issues, 39(2):15-33. Available at: <https://cre.org/wp-content/uploads/2014/10/Real-Estate-Issues-Power-Lines-and-Property-Prices.pdf>.
- Setterholm, D. R. 1995. *Depth to Bedrock and Thickness of Cretaceous Strata. County Atlas Series, Atlas C-10, Part A. Plate 5 – Depth to Bedrock*. Available at: <https://conservancy.umn.edu/server/api/core/bitstreams/d377ce77-ebf9-4bff-8283-505fd589b535/content>.
- Soil Survey Staff. 2026. *Web Soil Survey*. Available at: <https://websoilsurvey.sc.egov.usda.gov/>.
- South Dakota State University Extension. September 2023. *Bulk Density is an Indicator of Soil Health*. Available at: <https://extension.sdstate.edu/bulk-density-indicator-soil-health>.
- Stearns County. 2025. *Five-Year Road Improvement Program*. Available at: <https://www.stearnscountymn.gov/560/Road-Construction#docaccess-cda50d9473f6cdc2ad5aa46d046296af479e0e3323b099bb6fb682f1350a67b3>.
- Stearns County. 2025. *Road Program Map 2026 to 2030*. Available at: <https://www.stearnscountymn.gov/560/Road-Construction>.
- Stearns County. 2025. *Stearns County Official Zoning Map*. Available at: <https://content.civicplus.com/api/assets/d494293a-1d06-4969-933c-9c3b510cb29b>.
- Stearns County. 2026. *Stearns County 2030 Comprehensive Plan*. Available at: <https://www.stearnscountymn.gov/957/Stearns-County-2030-Comprehensive-Plan>.
- Stearns County. n.d. *History*. Available at: <https://www.stearnscountymn.gov/703/History>.
- Stearns County. n.d. *Zoning Districts*. Available at: <https://www.stearnscountymn.gov/945/Zoning-Districts>.
- U.S. Census Bureau. 2024. American Community Survey 5-Year Estimates (Tables: B03002 Hispanic or Latino Origin by Race; DP02 Selected Social Characteristics in the United States; S1701 Poverty Status in the Past 12 Months); 2020 Decennial Census (Table P1 Total Population).
- U.S. Census Bureau. 2024. *American Community Survey. Selected Economic Characteristics in the United States, Table DP03*. Available at: https://data.census.gov/table/ACSDP5Y2024.DP03?q=DP03&g=040XX00US27_050XX00US27093_27145_1400000US27093560200,27145011201.

- U.S. Census Bureau. 2025. *American Community Survey. People Reporting Ancestry – ACS 5-Year Estimates Data Profiles, Table B04006*. Available at:
<https://data.census.gov/table/ACSDT5Y2024.B04006?q=heritage&g=050XX00US27093,27145>.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2026. *National soil survey handbook, title 430-VI*. Available at:
<https://directives.sc.egov.usda.gov>.
- U.S. Department of Agriculture, Natural Resources Conservation Service. n.d. *Official Soil Series Descriptions*. Available at:
<https://www.nrcs.usda.gov/resources/data-and-reports/official-soil-series-descriptions-osds>.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2012. *Koronis Series*. Available at:
https://soilseries.sc.egov.usda.gov/OSD_Docs/K/KORONIS.html.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2014. *Lundlake Series*. Available at:
https://soilseries.sc.egov.usda.gov/OSD_Docs/L/LUNDLAKE.html.
- U.S. Department of Agriculture, Natural Resources Conservation Service. n.d. *Soil Data Access (SDA) Prime and other Important Farmlands*. Available at:
https://efotg.sc.egov.usda.gov/references/public/LA/Prime_and_other_Important_Farmland.html.
- U.S. Department of Agriculture, Natural Resources Conservation Service. 2024. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*. Available at:
<https://www.nrcs.usda.gov/sites/default/files/2024-09/Field-Indicators-of-Hydric-Soils.pdf>.
- U.S. Department of Labor Occupational Safety and Health Administration. n.d. *Electric Power Generation, Transmission, And Distribution Industry Hazards*. Available at:
<https://www.osha.gov/power-generation/industry-hazards>.
- U.S. Department of the Interior Bureau of Land Management. 2025. *The Official Federal Land Records Site*. Available at:
<https://glorerecords.blm.gov/>.
- U.S. Department of Transportation. 2026. *Pipeline and Hazardous Materials Safety Administration – National Pipeline Mapping System*. Available at:
<https://pvnpm.phmsa.dot.gov/PublicViewer/>.
- U.S. Environmental Protection Agency. 1992. *EMF in Your Environment. Magnetic Field Measurements of Everyday Electrical Devices*. Available at:
<https://nepis.epa.gov/Exe/tiff2png.cgi/000005EP.PNG?-r+75+-g+7+D%3A%5CZYFILES%5CINDEX%20DATA%5C91THRU94%5CTIFF%5C00000191%5C000005EP.TIF>.
- U.S. Environmental Protection Agency. 2025. *Current Nonattainment Counties for All Criteria Pollutants*. Available at:
<https://www3.epa.gov/airquality/greenbook/ancl.html>.

- U.S. Fish and Wildlife Service. 2024. *Endangered and Threatened Wildlife and Plants; Endangered Status for the Eastern Regal Fritillary and Threatened Status with Section 4(d) Rule for the Western Regal Fritillary, Proposed Rule*. Available at:
<https://www.govinfo.gov/content/pkg/FR-2024-08-06/pdf/2024-16982.pdf>.
- U.S. Fish and Wildlife Service. 2024. *Monarch Butterfly (Danaus plexippus) Species Status Assessment Report, Version 2.3 (December 2024)*. Available at:
https://www.fws.gov/sites/default/files/documents/2025-01/ssa_monarch-butterfly_2024.pdf.
- U.S. Fish and Wildlife Service. 2024. *Suckley's Cuckoo Bumble Bee (Bombus suckleyi) Species Status Assessment, Alaska Region, Version 1 (August 2024)*. Available at:
<https://iris.fws.gov/APPS/ServCat/DownloadFile/263505>.
- U.S. Fish and Wildlife Service. 2026. *Bald and Golden Eagle Protection Act*. Available at:
<https://www.fws.gov/law/bald-and-golden-eagle-protection-act>.
- University of Minnesota Extension. 2018. *Soil compaction*. Available at:
<https://extension.umn.edu/soil-management-and-health/soil-compaction>.
- World Health Organization. 2007. *Extremely Low Frequency Fields. Environmental Health Criteria Monograph No. 238*. Available at:
<https://www.who.int/publications/i/item/9789241572385>.