APPLICATION TO THE MINNESOTA PUBLIC UTILITIES COMISSION FOR A ROUTE PERMIT FOR THE ALEXANDRIA TO BIG OAKS 345 KV TRANSMISSION PROJECT

MPUC Docket No. E002, E017, ET2, E015, ET10/TL-23-159

September 29, 2023

Submitted by
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Great River Energy
Minnesota Power
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Western Minnesota Municipal Power Agency

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Alexandria to Big Oaks 345 kV Transmission Project

September 29, 2023

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°F	degrees Fahrenheit
AIMP	Agricultural Impact Mitigation Plan
AM	amplitude modulation
APLIC	Avian Power Line Interaction Committee
AQI	Air Quality Index
BCC	Birds of Conservation Concern
BMP	best management practice
CCCL	Center for Corporate Climate Leadership
CFR	Code of Federal Regulations
CH_4	methane
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Commission	Minnesota Public Utilities Commission
CSAH	County State-Aid Highway
CWA	Clean Water Act
dBA	A-weighted decibel
MDNR	Minnesota Department of Natural Resources
ECS	Ecological Classification System
EERA	Energy Environmental Review and Analysis
EMF	electric and magnetic field
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FAR	Federal Aviation Regulation
FEMA	Federal Emergency Management Administration
FM	frequency modulation
FPPA	Farmland Protection Policy Act
GBCA	Grassland Bird Conservation Areas
GHG	greenhouse gas
GIS	Geographic Information System
GPS	Global Positioning System
GWP	Global Warming Potential
HVTL	high voltage transmission line
IBA	Important Bird Areas

IPaC	Information for Planning and Consultation
ISD	Independent School District
kV	kilovolt
LGU	local government unit
LRTP	Long-Range Transmission Planning
MDH	Minnesota Department of Health
mG	milligauss
MHz	megahertz
MISO	Midcontinent Independent System Operator, Inc.
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAC	Noise Area Classification
NESC	National Electric Safety Code
NHIS	Natural Heritage Inventory System
NLR	Northern Lines Railway
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
PWI	Public Waters Inventory
SBS	Sites of Biodiversity Significance
SF_6	sulfur hexafluoride
SHPO	State Historic Preservation Office
SOO	SOO Line Railroad
SPCC	Spill Prevention, Control, and Countermeasure
SSURGO	Soil Survey Geographic
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VMP	Vegetation Management Plan
VOR	Very High Frequency Omnidirectional Radio Range
WMA	Wildlife Management Areas
WPA	Waterfowl Production Areas

1 Introduction

Northern States Power Company, doing business as Xcel Energy (Xcel Energy), along with Great River Energy, Minnesota Power, Otter Tail Power Company (Otter Tail), and Missouri River Energy Services, on behalf of Western Minnesota Municipal Power Agency (Western Minnesota), (collectively, the Applicants) are applying for a Route Permit from the Minnesota Public Utilities Commission (Commission) for approval to construct the Alexandria to Big Oaks 345 kilovolt (kV) Transmission Project (Project or Alexandria to Big Oaks Project) in Douglas, Todd, Stearns, Sherburne, and Wright counties in Minnesota. The Project involves construction of an approximately 105 to 108-mile long, 345 kV transmission line from the existing Alexandria Substation located in Alexandria, Douglas County to the new Big Oaks Substation that will be constructed on the north side of the Mississippi River in Becker, Sherburne County (Map 1). The majority of the Applicants' Proposed Route for the new 345 kV transmission line from the existing Alexandria Substation to the new Big Oaks Substation follows existing transmission line right-of-way as the Project involves placing this new 345 kV transmission circuit on existing CapX2020 transmission line structures that were previously permitted and constructed as double-circuit capable as part of the Monticello to St. Cloud 345 kV Transmission Project (E002, ET2/TL-09-246) and the Fargo to St. Cloud 345 kV Transmission Project (E002, ET2/TL-09-1056).

At four locations, the Proposed Route deviates from the existing transmission line right-of-way. New right-of-way will be required for the new 345 kV transmission line to tap into the Alexandria Substation, a reconfiguration of the existing 345 kV circuit from Alexandria (to the Quarry Substation) to bypass the Riverview Substation near the city of Freeport, and to bypass the Quarry Substation near the city of Waite Park (Map 1). The cumulative length of these three areas of new right-of-way is less than one mile total. Additionally, new right-of-way will be required for a new crossing over the Mississippi River to connect the new 345 kV transmission line near Monticello to the new Big Oaks Substation located northwest of the Monticello Nuclear Generating Plant in Becker. Two options are currently being considered by the Applicants for this river crossing (Map 1), the length of this new transmission line right-of-way will range from 0.7 miles to 2.1 miles. The new 345 kV transmission line from the Alexandria Substation to the Big Oaks Substation, Alexandria Substation Tap, Riverview Substation Bypass, Quarry Substation Bypass, Mississippi River Crossing Options and

the Big Oaks Substation Siting Area are collectively referred to as the Project Components.

1.1 Project Need

The Alexandria to Big Oaks Project is one segment of the larger Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project. The Project comprises the Eastern Segment of the Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project. A separate Route Permit application will be filed for the Western Segment.

The Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project was studied, reviewed, and approved as part of the Long-Range Transmission Planning (LRTP) Tranche 1 Portfolio by the Midcontinent Independent System Operator, Inc.'s (MISO) Board of Directors in July 2022 as part of its 2021 Transmission Expansion Plan.

The LRTP Tranche 1 Portfolio will provide significant benefits to the Midwest subregion of the MISO footprint by facilitating more reliable, safe, and affordable energy delivery. The Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project, designated as LRTP2 in 2021 Transmission Expansion Plan, is a key part of the LRTP Tranche 1 Portfolio. More specifically, the existing 230 kV transmission system in eastern North Dakota and South Dakota plays a key role in transporting and delivering energy into Minnesota. The 230 kV system is at its capacity leading to a number of reliability concerns that could affect customers' service. The Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project is needed to provide additional transmission capacity, to mitigate current capacity issues, and to improve electric system reliability throughout the region as more renewable energy resources are added to the electric system in and around the region.

1.2 Project Ownership

The Project will be jointly owned by Xcel Energy, Great River Energy, Minnesota Power, Otter Tail and Western Minnesota.

Xcel Energy, a Minnesota corporation headquartered in Minneapolis, is a wholly owned subsidiary of Xcel Energy Inc., a utility holding company with its headquarters in Minneapolis. Xcel Energy will be responsible for the construction of the proposed 345 kV transmission circuit and for the maintenance of the 345 kV transmission

circuit from the Quarry Substation to the Big Oaks Substation. The equipment and improvements required inside the Quarry Substation and the new Big Oaks Substation will be owned solely by Xcel Energy.

Great River Energy is a not-for-profit wholesale electric power cooperative based in Maple Grove, Minnesota and is a member of MISO and the MRO. Great River Energy is anticipated to be responsible for the maintenance of the 345 kV transmission circuit from the Alexandria Substation to the Quarry Substation. The equipment and improvements required inside the Riverview Substation will be owned solely by Great River Energy.

Minnesota Power is an investor-owned public utility headquartered in Duluth, Minnesota and is a member of MISO.

Otter Tail Power Company is an investor-owned electric utility headquartered in Fergus Falls, Minnesota, and is a transmission-owning member of MISO.

Western Minnesota is a municipal corporation and political subdivision of the State of Minnesota, headquartered in Ortonville, Minnesota. The equipment and improvements required inside the Alexandria Substation will be owned solely by Western Minnesota.

Each party will be responsible for the construction and maintenance of its own substation.

1.3 Permittee

Xcel Energy, Great River Energy, Minnesota Power, Otter Tail and Western Minnesota are the requested permittees for the Project. Contact information is provided below.

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1.4 Certificate of Need Process

Minn. Stat. § 216B.243 dictates that a Certificate of Need is required for a "large energy facility". A large energy facility as defined in Minn. Stat. § 216B.2421 includes "any high-voltage transmission line with a capacity of 200 kVs or more and greater than 1,500 feet in length" and "any high-voltage transmission line with a capacity of 100 kVs or more with more than ten miles of its length in Minnesota or that crosses a state line". The Applicants filed an application for a Certificate of Need to construct the Big Stone South – Alexandria – Big Oaks 345 kV Project on September 29, 2023, in Docket No. E002, E017, ET2, E015, ET10/CN-22-538.

1.5 State Routing Process

This Route Permit Application (Application) is submitted under the alternative review process set forth by Minnesota law, specifically, Minn. Stat. § 216E.04 and Minn. R. 7850.2800 to 7850.3900 and contains the information required under Minn. R. 7850.1900. A Route Permit completeness checklist is provided in Appendix A with cross references indicating where the information required by Minnesota Statutes and Rules can be found in this Application. As provided for in Minn. Stat. § 216E.04, subd. 2(5), a high-voltage transmission line designed and capable of operation above 200 kV is eligible for the alternative permitting process if at least 80 percent of the distance of the line in Minnesota will be located along existing high-voltage transmission line right-of-way. The Project qualifies for review under the alternative permitting process authorized by Minn. Stat. § 216E.04, subd. 2(5) and Minn. R. 7850.2800, subp. 1(E) because at least 80 percent of the Proposed Route is along existing high-voltage transmission line rights-of-way.

The Applicants notified the Commission on September 1, 2023, that the Applicants intended to use the alternative permitting process for the Project. This letter complied with the requirements of Minn. R. 7850.2800, subp. 2, to notify the Commission of this election at least 10 days prior to submitting an application for a Route Permit. A copy of this letter is attached as Appendix B.

Under the alternative review process, the applicant is not required to propose a second site or route for the project but should include in their application any other sites or routes that were rejected by the applicant. The Commission may identify additional sites or routes to consider during their review of the application as necessary. A "route" is defined in Minn. R. 7850.1000 as "the location of a high

voltage transmission line between two end points…[with] a variable width of up to 1.25 miles". The route being proposed by the Applicants and the Applicants' route development process (Route or Project Route) are described in Sections 3 and 4.

In this Route Permit proceeding, the Commission staff, the Department of Commerce-Energy and Environmental Review and Analysis (EERA) staff, and an administrative law judge from the Office of Administrative Hearings will oversee evaluation and review of the Project through the gathering of input from agencies, local government units (LGUs), and the public (Figure 1.5-1).

Figure 1.5-1 Minnesota Public Utilities Commission Alternative Process

Source: Reference (1)

After the application is submitted, the Commission will review the application for completeness; this stage also includes a public comment period. Next, a public information and scoping meeting is held to gather comments and information from stakeholders in the Project Study Area (as shown in Map 1) and those on the Project contact list.

Interested parties may find additional information on how to get involved here: https://mn.gov/puc/get-involved/. To subscribe to the Project's dockets (Certificate of Need and/or Route Permit) and to receive email notifications when information is filed in the dockets, visit: https://www.edockets.state.mn.us/, and select "Subscribe to Dockets", enter your email address and select "Docket Number" from the Type of Subscriptions dropdown box. For the Certificate of Need, select "22" for the first Docket number drop down box and enter "538" in the second box. For the Route Permit, select "23" for the first Docket number drop down box and enter "159" in the second box. Then click on the "Add to List" button. You must then click the "Save" button at the bottom of the page to submit your subscription request. You should receive an email from Efiling.Admin@state.mn.us to the e-mail address you provided; you must click the link in this email to confirm your subscription to the Project's docket.

If you would like to have your name added to the Project mailing list, send an email to docketing.puc@state.mn.us or call 651.201.2204 (800.657.3782). If you send an email or leave a phone message, please include: (1) how you would like to receive mail (regular mail or email) and (2) the docket number (CN-22-538 for the Certificate of Need or TL-23-159 for the Route Permit), your name, and your complete mailing address or email address.

The public can review this Application and submit comments on the Project to the Commission. A copy of the Application is available at the Commission's website: https://mn.gov/puc/. On the Commission's homepage, click on the eDockets link in the menu at the top of the page, click on "Go to eDockets" and then enter the docket number information; "23" for the Year and "159" for the Number in the "Basic Search" section. A copy of the Application is also available on the Project websites: www.AlexandriatoBigOaks.com. This Application will also be available at the following locations for the public to review:

- Monticello Great River Regional Library, 200 W. 6th St. Monticello, MN
- Clearwater Great River Regional Library, 740 Clearwater Center, Clearwater, MN
- Douglas County Library, 720 Fillmore St., Alexandria, MN
- Glenwood Public Library, 108 1st Ave. SE, Glenwood, MN

Following the scoping meeting and public comment period, the Commission will consider alternatives for the Project, and EERA will gather information to prepare an Environmental Assessment (EA) for the Project and alternatives considered. EERA will then issue an EA for the Project.

A public hearing will then be held for the Project, conducted by an administrative law judge from the Office of Administrative Hearings. After the hearing and public comment period, the administrative law judge will prepare and submit a report to the Commission. The Commission will issue a final decision on an application after receipt of the report from the administrative law judge.

If you have questions about the state regulatory process, you may contact the Minnesota state regulatory staff listed below:

Minnesota Public Utilities Commission
Craig Janezich
121 7th Place East, Suite 350
St. Paul, Minnesota 55101
651.296.0406
800.657.3782
Email: craig.janezich@state.mn.us
Website: www.mn.gov/puc/

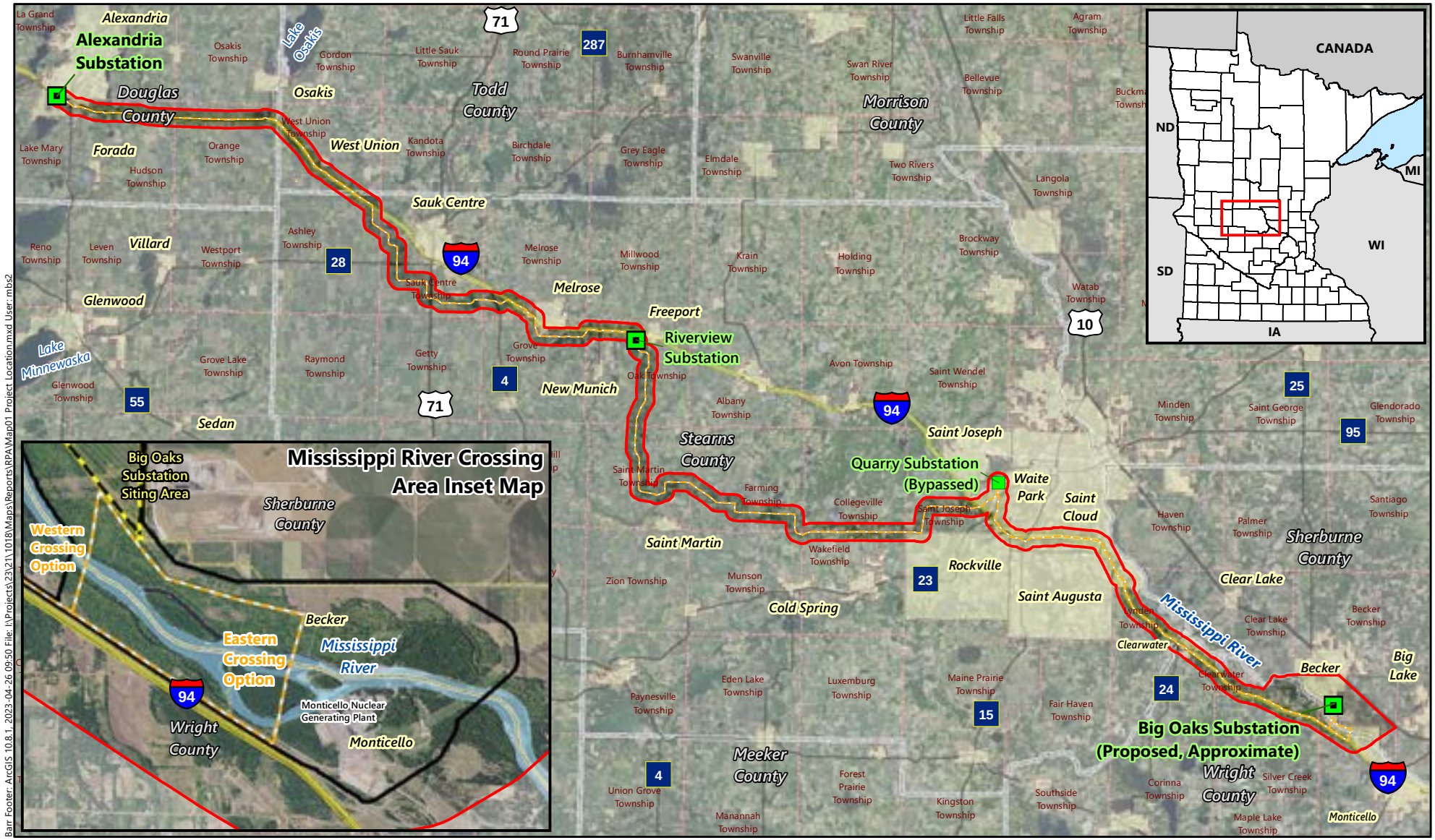
Minnesota Department of Commerce EERA
Jenna Ness
85 7th Place East, Suite 280
St. Paul, Minnesota 55101
651.296.1500
800.657.3602
Email: jenna.ness@state.mn.us
Website: www.mn.gov/commerce

1.6 Request for Joint Proceeding with Certificate of Need Application

Minn. Stat. § 216B.243, subd. 4 and Minn. R. 7849.1900, subp. 4 permit the Commission to hold joint proceedings for the Certificate of Need and Route Permit in circumstances where a joint hearing is feasible, more efficient, and may further the public interest.

The Applicants respectfully requests that the Commission order a joint regulatory review process for the Route Permit and Certificate of Need applications. Given the

timing of submittal for the Certificate of Need and Route Permit applications, a joint hearing makes sense and would provide efficiencies, allowing for consolidated public information sharing and input opportunities on both the Project need and Proposed Route.



Barr Footer: ArcGIS 10.8.1, 2023-04-26 09:50 File: I:\Projects\23\21\1018\Maps\Reports\RPA\Map01 Project Location.mxd User: mbs2

- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Interstate Highway
- US Highway
- State Highway
- County State-Aid Highway
- Municipal Boundary
- Civil Township
- County Boundary
- State Boundary

Miles

8 0 8

Map 1

PROJECT LOCATION

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

2 Project Information

2.1 Project Location

The Project is between the city of Alexandria in Douglas County and the city of Becker, Sherburne County, Minnesota (Map 1). The Proposed Route is partially located within the following municipalities: Alexandria, Becker, Clearwater, Freeport, Melrose, Monticello, Rockville, Saint Cloud and Waite Park, Minnesota. Table 2.1-1 identifies the townships and sections crossed by the Proposed Route.

Table 2.1-1 Townships within the Proposed Route

City or Township Name	Township and Range	Sections
Alexandria	T127N R37W	6
Alexandria	T127N R38W	1
Alexandria	T128N R38W	36
Ashley Township	T126N R35W	1,12
Ashley Township	T127N R35W	35,36
Becker	T33N R28W	7,16,17,18,19,20,21
Becker	T33N R29W	12,13
Becker Township	T33N R28W	16,17,18
Clearwater	T122N R27W	2,3
Clearwater Township	T122N R26W	7,17,18,20
Clearwater Township	T122N R27W	1,2,3,12
Clearwater Township	T123N R27W	34
Collegeville Township	T124N R30W	33,34,35,36
Farming Township	T124N R31W	19,25,26,28,29,30,32,33,34,35,36
Farming Township	T124N R32W	24
Freeport	T125N R32W	3,4,9,10,10
Grove Township	T125N R33W	1,2,3,10,11,12
Hudson Township	T127N R37W	1,2,3,4,5,6
La Grand Township	T127N R38W	1
La Grand Township	T128N R38W	35,36
Lake Mary Township	T127N R37W	6
Lake Mary Township	T127N R38W	1
Lake Mary Township	T128N R38W	36
Lynden Township	T122N R27W	3
Lynden Township	T123N R27W	19,20,28,29,33,34
Melrose	T125N R33W	3,10
Melrose	T126N R33W	33,34
Melrose Township	T126N R33W	29,30,31,32,33,34

City or Township Name	Township and Range	Sections
Melrose Township	T126N R34W	25,36
Monticello	T122N R25W	32,33,33
Monticello	T33N R28W	19,20,20
Monticello Township	T122N R25W	30,31,32,32
Monticello Township	T33N R28W	19
Munson Township	T123N R30W	6
Munson Township	T123N R31W	1
Munson Township	T124N R31W	36
Oak Township	T124N R32W	4
Oak Township	T125N R32W	4,5,6,9,10,15,22,27,33,34
Oak Township	T125N R33W	1
Orange Township	T127N R35W	7
Orange Township	T127N R36W	1,2,3,4,5,6,12
Orange Township	T127N R37W	1
Rockville	T123N R29W	1,6
Rockville	T123N R30W	1
Rockville	T124N R29W	31
Rockville	T124N R30W	36
St. Cloud	T123N R27W	7,18,19
St. Cloud	T123N R28W	1,2,3,4,5,6,12
St. Cloud	T123N R29W	1
St. Joseph Township	T124N R29W	26,27,28,29,31,32,36
St. Joseph Township	T124N R30W	36
St. Martin Township	T124N R32W	4,9,10,15,16,21,22,23,24,26,27
Sauk Centre Township	T126N R34W	7,17,18,19,20,21,25,27,28,29,33,34,35,36
Sauk Centre Township	T126N R35W	12
Silver Creek Township	T122N R25W	30
Silver Creek Township	T122N R26W	16,17,20,21,22,23,25,26
Waite Park	T123N R28W	6
Waite Park	T123N R29W	1
Waite Park	T124N R29W	13,23,24,25,26,36
Wakefield Township	T123N R30W	1,2,3,4,5,6
Wakefield Township	T124N R30W	33,34,35,36
West Union Township	T127N R35W	7,8,17,18,20,21,26,27,28,35

2.2 Project Description

The Project involves construction of an approximately 105 to 108-mile long, new 345 kV transmission line on existing infrastructure from the Western Minnesota Municipal

Power Agency's existing Alexandria Substation located in Alexandria, Douglas County to the new Big Oaks Substation that will be constructed on the north side of the Mississippi River in Becker, Sherburne County (Map 1).

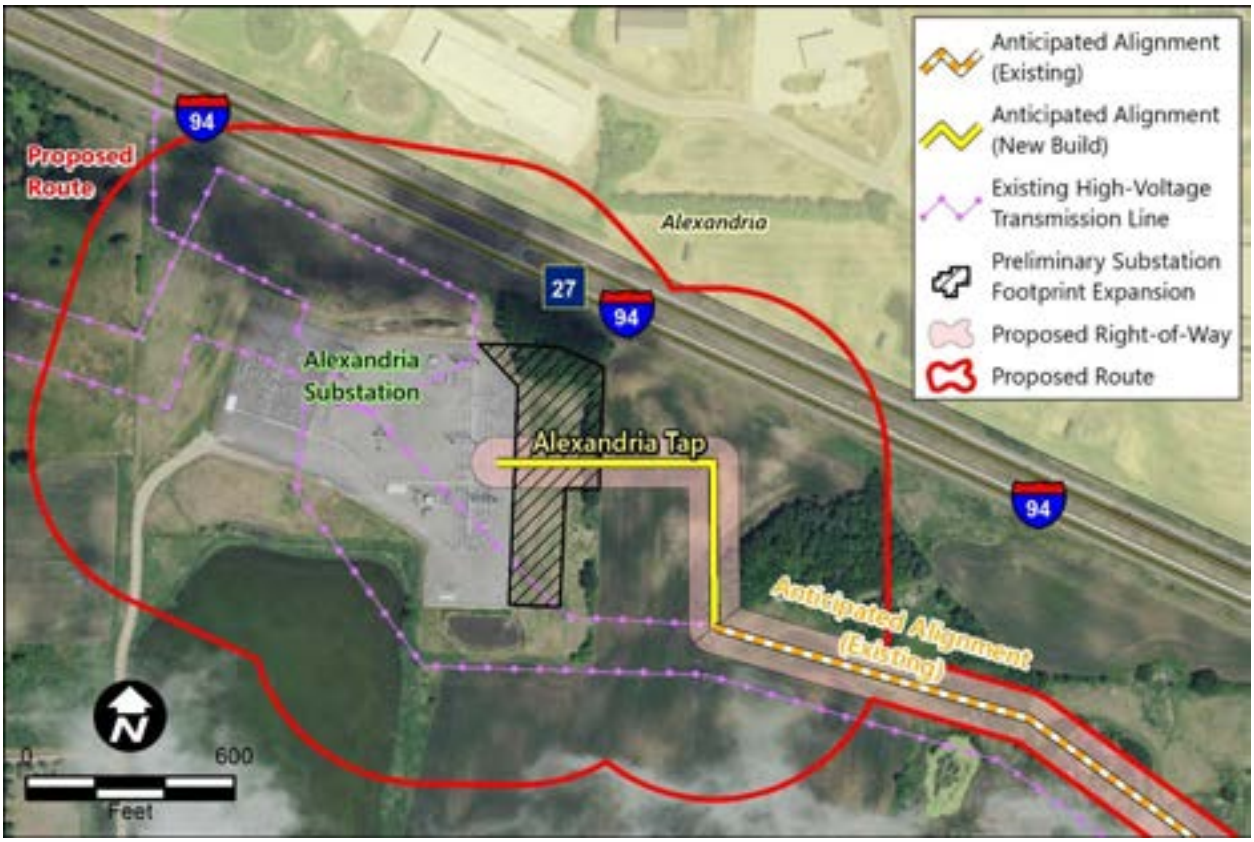
The Project involves placing this new 345 kV transmission circuit on existing CapX2020 transmission line structures that were previously permitted and constructed as double-circuit capable as part of the Monticello to St. Cloud 345 kV Transmission Project (E002, ET2/TL-09-246) and the Fargo to St. Cloud 345 kV Transmission Project (E002, ET2/TL-09-1056).

At four locations along the Project, the new transmission line is proposed to deviate from existing infrastructure as described in the following sections. For purposes of evaluating potential impacts of the Project, the Applicants have developed what they currently believe to be the likely alignments that minimize the overall potential impacts based on the routing factors identified in Minn. Stat. § 216E.03, subd. 7(b) and Minn. R. 7850.4100. These alignments are referred to as the "anticipated alignment(s)". These anticipated alignments may require modifications within the Proposed Route corridor after a Route Permit is issued due to limitations inherent in identifying an alignment absent detailed survey and engineering work, site review, and design. The anticipated alignments are available on the detailed maps in Appendix C.

2.2.1 Alexandria Substation Tap

The existing Alexandria Substation is on the southern edge of the City of Alexandria just south of Interstate 94. The Proposed Route will follow the existing right-of-way to the Alexandria Substation, at which point it would deviate and require the installation of approximately 0.2 miles of new transmission right-of-way to "tap" into the Alexandria Substation (Map 2).

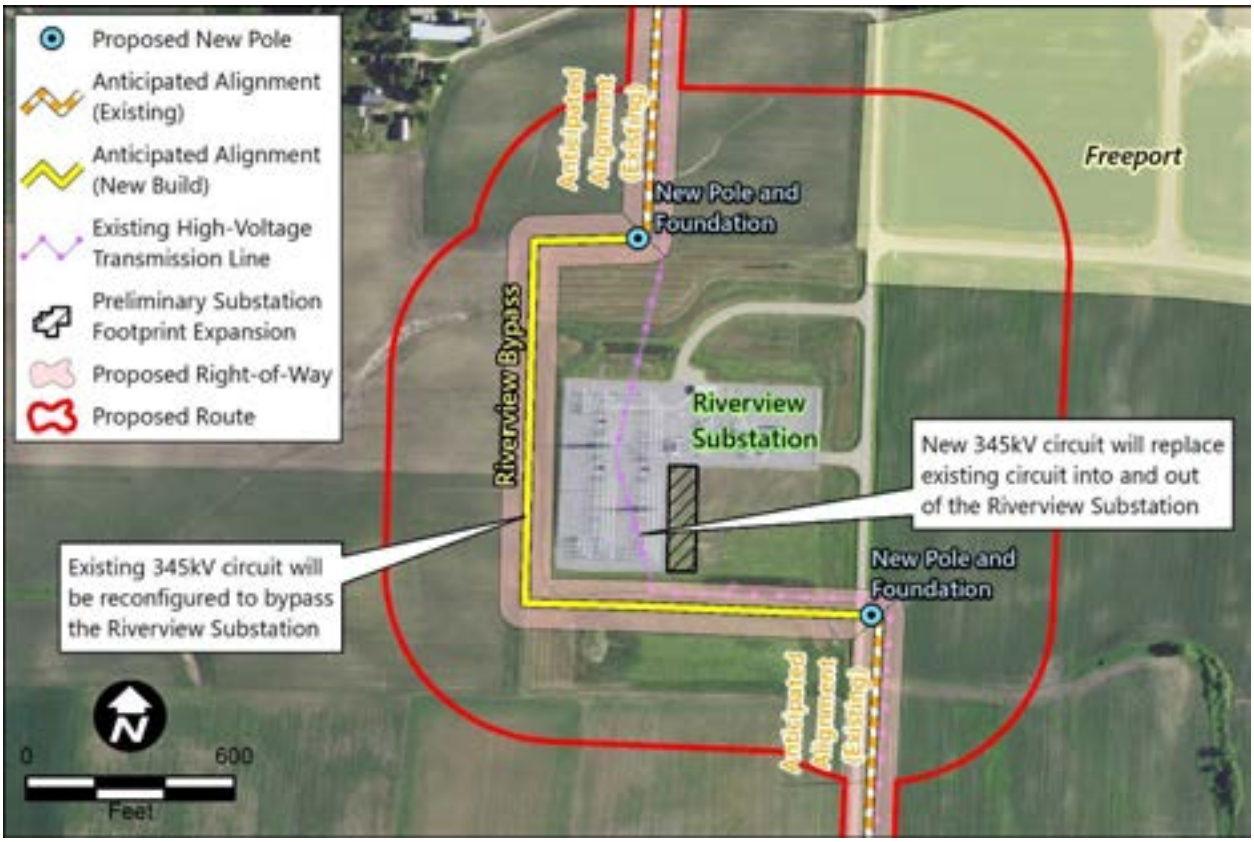
Map 2 Alexandria Substation Tap Detail



2.2.2 Riverview Substation Bypass

The existing Riverview Substation is in Stearns County, Minnesota. The Proposed Route will follow the existing right-of-way to the Riverview Substation. The existing circuit into the Riverview Substation will be reconfigured to bypass the Riverview Substation and the new circuit from the Alexandria Substation will connect to the Riverview Substation before its ultimate destination to the Big Oaks Substation. The bypass is required because if both circuits are brought into the Riverview Substation, an outage of both circuits south of the substation causes increased overloads to the underlying 69 kV system. For this reason, one circuit will bypass the substation. This bypass would result in approximately 0.5 miles of new transmission right-of-way around the Riverview Substation (Map 3).

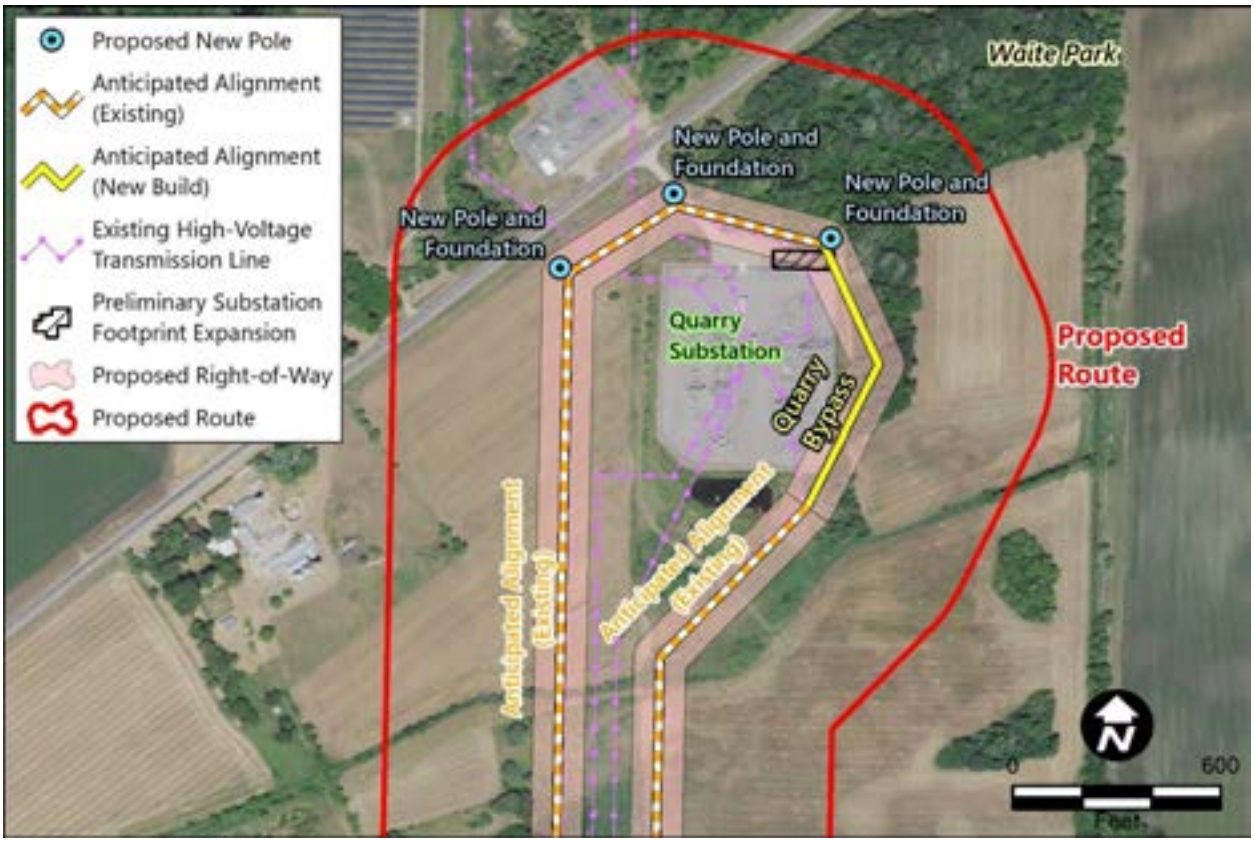
Map 3 Riverview Substation Bypass Detail



2.2.3 Quarry Substation Bypass

The Proposed Route will follow the existing infrastructure from the Riverview Substation to the Quarry Substation where it would then bypass the Quarry Substation. The bypass is required because if both circuits are brought into the Quarry Substation, an outage of both circuits south of the substation causes increased overloads to the underlying 69 kV system. For this reason, one circuit will bypass the substation. This bypass would result in approximately 0.2 miles of new transmission right-of-way around the Quarry Substation (Map 4).

Map 4 Quarry Substation Bypass Detail



2.2.4 Mississippi River Crossing Alignment Options

The easternmost portion of the Project will deviate from the existing infrastructure to connect to the new Big Oaks Substation, which is northwest of the existing high voltage transmission line (HVTL) infrastructure. A new crossing over the Mississippi River near the city of Monticello will be constructed to connect to the new Big Oaks Substation located northwest of the Monticello Nuclear Generating Plant in Becker. Two options are currently being considered by the Applicants for this river crossing (Table 2.2-1). The total length and percentage of new transmission line right-of-way varies depending on the Mississippi River Crossing Option (Table 2.2-1).

Western Crossing Option: The Western Crossing Option would construct a new crossing of the Mississippi River directly south of the proposed Big Oaks Substation and would be approximately 0.7 miles long (Table 2.2-1). This alignment would include new right-of-way located entirely on Xcel Energy-owned land.

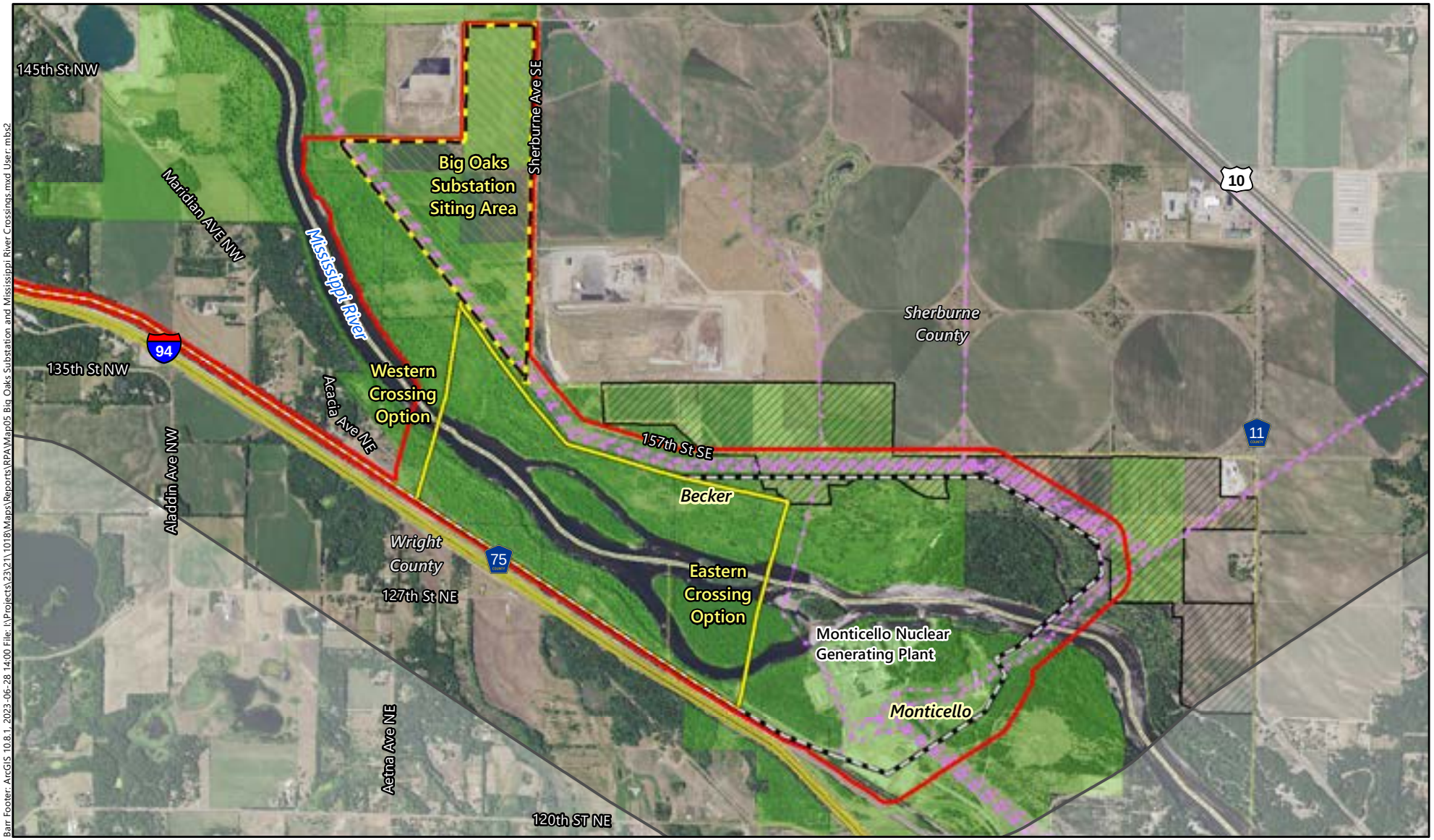
Eastern Crossing Option: The Eastern Crossing Option would construct a new crossing of the Mississippi River just west of the Monticello Nuclear Generating

Plant. This option would be approximately 3.4 miles and would parallel an existing 115 kV transmission line (Table 2.2-1). This option would include 2.1 miles of new transmission line right-of-way and be located entirely on Xcel Energy-owned land; it would require two separate structures be placed on an island in the Mississippi River.

Table 2.2-1 Mississippi River Crossing Options

Option	Total Project Length (miles)	Option Length (miles)[1]	Option Length, New Right-of-way (miles)[2]	River Crossing Length (feet)[3]	Total New Right-of-way Length (miles)[4]	Percent New Right-of-way
Western Crossing Option	105.3	0.7	0.7	450	1.5	1.4%
Eastern Crossing Option	108.0	3.4	2.1	2,200	2.9	2.7%

[1] Length of the Option including both new and existing right-of-way.
[2] Length of portion of the Option that is new right-of-way.
[3] Length of portion of the Option that spans the Mississippi River.
[4] The total length of new right-of-way for the entire project including all substation taps, bypasses and the Mississippi River crossing.



Barr Footer: ArcGIS 10.8.1, 2023-06-28 14:00 File: I:\Projects\23\21\1018\Maps\Reports\RPA\Map05 Big Oaks Substation and Mississippi River Crossings.mxd User: mbs2

- Proposed Route
- Project Study Area
- Anticipated Alignment (Existing)
- Anticipated Alignment (New Build)
- Alignment Considered But Rejected
- Existing High-Voltage Transmission Line
- University of Minnesota Sand Plain Research Farm
- Xcel Energy Owned Parcel
- Municipal Boundary
- County Boundary

Feet

0 2,500

Map 5

BIG OAKS SUBSTATION AND MISSISSIPPI RIVER CROSSINGS

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

2.3 Associated Facilities

The associated facilities for the Project include expansion of the existing Alexandria Substation, expansion of the existing Riverview Substation, expansion of the existing Quarry substation and construction of the new Big Oaks Substation.

2.3.1 Alexandria Substation Expansion

The existing Alexandria Substation is on the southern edge of the City of Alexandria just south of Interstate 94 (Map 2). New substation equipment necessary to accommodate the proposed 345 kV transmission line will be installed at the Alexandria Substation. Equipment will include new termination structures, circuit breakers, relays and associated control equipment. An expansion of approximately 2 to 4 acres from the current fenced area will be required to accommodate the new substation equipment and will require the purchase of additional land.

2.3.2 Riverview Substation Expansion

The existing Riverview Substation is in Stearns County, Minnesota (Map 3). The existing 345 kV circuit from the Alexandria Substation (to the Quarry Substation) will be reconfigured to bypass the Riverview Substation and the new 345 kV circuit from the Alexandria Substation to the Big Oaks Substation will connect to the Riverview Substation. New substation equipment necessary to provide reactive power support will be installed at the Riverview Substation. The current fenced area of the Riverview Substation will be expanded by approximately 0.5 acres on Great River Energy owned property to accommodate this new substation equipment.

2.3.3 Quarry Substation Expansion

The existing Quarry Substation is in Stearns County, Minnesota (Map 4). New substation equipment necessary to provide reactive power support will be installed at the Quarry Substation. The current fenced area of the Quarry Substation will be expanded by approximately 0.3 acres on Xcel Energy owned property to accommodate this new substation equipment.

2.3.4 Big Oaks Substation Construction

The Big Oaks Substation will be a 345 kV switching station located northwest of the Monticello Nuclear Generating Plant in Becker, Minnesota. The exact location of the substation has not yet been determined, but a 250-acre portion of land owned primarily by the Xcel Energy has been identified as the location for the substation;

this area is being referred to as the "Big Oaks Substation Siting Area" (Map 5). The Applicants are evaluating the Big Oaks Substation Siting Area to confirm adequate space for planned facilities, future transmission line interconnections, and an additional area surrounding the proposed facility to minimize immediate encroachment with other existing or new land uses (Map 1).

Big Oaks Substation will include eighteen 345 kV circuit breakers configured to accommodate the connection of up to twelve 345 kV transmission lines. Substation equipment necessary to provide reactive power support will also be installed. The Big Oaks Substation will be located on a graded and fenced area of approximately 10 acres. The following transmission lines are proposed to connect to the Big Oaks Substation:

- Four existing 345 kV transmission lines originating at the Sherburne County Substation;
- The Eastern Segment of the Project: the 345 kV transmission line from Alexandria Substation to Big Oaks Substation; and
- Two 345 kV transmission lines proposed as part of LRTP3 (Benton County – Big Oaks Line #1, Benton County – Big Oaks Line #2).

The Applicants are evaluating a 250-acre property for the proposed Big Oaks Substation to confirm adequate space for planned facilities, future transmission line interconnections, and an additional area surrounding the proposed facility to minimize immediate encroachment with other existing or new land uses (Map 5).

2.4 Route Width

The route width is the area in which the Commission authorizes a permittee to place the proposed transmission line facilities. The route may have "a variable width of up to 1.25 miles," within which the right-of-way for the facilities can be located (Minn. Stat. § 216E.01, subd. 8). The right-of-way is the specific area that is required for the easement for the transmission line. By requesting a route width that is wider than the right-of-way, the Applicants will have some flexibility to make alignment adjustments during final design to work with landowners, avoid sensitive natural resources, and to manage construction constraints as practical.

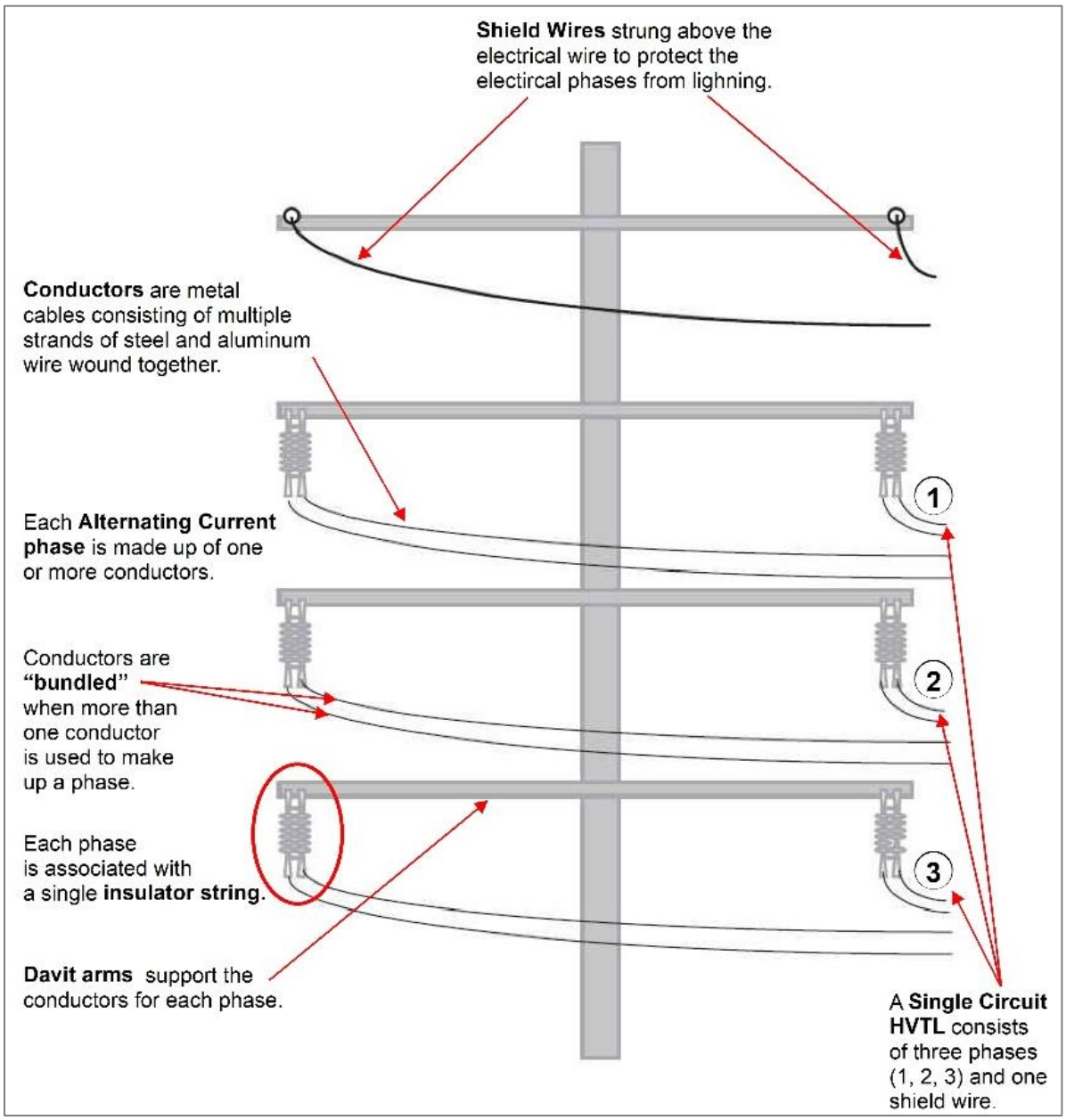
For this Project, the Applicants proposes a route width ranging from approximately 150 feet to 1,000 feet along proposed alignments, and up to 1 mile around the proposed Big Oaks Substation and Mississippi River crossing locations. For the portion of the Project where the Applicants plan to add the second 345 kV circuit to the existing infrastructure, the Applicants are requesting a route width of 150 feet centered on the right-of-way of the existing double-circuit capable structures. For the portions of the Project that will deviate from the existing right-of-way, the Applicants are requesting a route width of 1,000 feet centered on the anticipated alignment of the new 345 kV transmission line (i.e., 500 feet on either side of the line). The Applicants are also requesting a route width of 500 feet around the Alexandria, Riverview, and Quarry substations.

The Applicants are requesting a route width of 600 feet to almost 2,000 feet extending west from the Big Oaks Substation Siting Area to the Mississippi River, creating a wider route width ranging from 0.75 to 1.0 miles in this area. The Applicants are requesting the larger route in this area due to site-specific considerations and to accommodate both the Big Oaks Substation interconnection and Mississippi River crossing.

2.5 Transmission Structure and Conductor Design

A HVTL consists of three phases (conductors), each at the end of a separate insulator string, and all physically supported by structures. Conductors are metal cables consisting of multiple strands of steel and aluminum wire wound together. There are also two shield wires strung above the electrical phases to prevent damage from lightning strikes (Figure 2.5-1). These cables are typically less than one inch in diameter. The shield wire can also include fiber optic cable which provides a communication path between substations for transmission line protection equipment. The majority of this Project involves adding a second 345 kV circuit to an existing single-circuit (double-circuit capable) transmission line, creating a double-circuit transmission line (six phases) and two shield wires.

Figure 2.5-1 Typical Double-Circuit Transmission Line



The new conductors will be strung primarily on existing monopole, galvanized steel, double-circuit structures (Figure 2.5-2).

Figure 2.5-2 Typical 345 kV Structures

345 kV Steel Single-Circuit Monopole Structure

345 kV Steel Single-Circuit H-Frame Structure

345 kV/345 kV Steel Double-Circuit Monopole Structure

Figure 2.5-3 Existing 345 kV Double-Circuit Capable Monopole Structure with Single Circuit Strung

When these structures were originally installed, they left space for this future second circuit, allowing electrical capacity to be increased without additional structure installation. For this Project, there are certain locations where new structures will be required. Approximately 67 to 78 new structures are proposed depending on the Mississippi River Crossing selected for the Project. New structures are needed in select areas along the existing infrastructure to accommodate angles (i.e., where the alignment turns), highway crossings, or where the anticipated alignment deviates from the existing infrastructure (e.g., substation bypasses, new substation taps and the Mississippi River crossing). The angle structures were originally designed as 2-pole structures, typical for double circuit 345kV lines; one full circuit and a shield wire attached to each pole. When the first circuit was installed, there was no need for the second monopole; also, without wires attached, the second monopole would have been susceptible to damage from vibration. As part of this Project, the second monopole will be installed. The approximate location of new structures along the existing transmission line infrastructure and other areas where detailed engineering has been completed are shown in Appendix C maps; structures are not shown for areas where detailed design has not been completed including portions of the Proposed Route at the Mississippi River Crossing. New structures will primarily be monopole structures; however, H-frame structures may be used at the Mississippi River crossing or if needed to accommodate longer spans. Where a second monopole structure is required next to an existing structure, it will be placed within the existing right-of-way, 40 to 60 feet from the existing structure (Figure 2.5-4).

Figure 2.5-4 Typical Configuration of Two Monopole Structures Side-by-side

The proposed new structures will range in height from 75 feet to 160 feet tall. The typical span between structures is about 1,000 feet. A single pole structure is typically installed on a concrete foundation while an H-frame structure can either be installed on two concrete foundations or directly embedded in the ground. Table 2.5-1 and Appendix D summarizes the typical structure designs for the Project.

Table 2.5-1 Typical Structure Design Summary

Line Type	Structure Type	Structure material	Typical Right-of-Way Width (feet)	Structure Height (feet)	Foundation Diameter (feet)	Average Span Between Structure (feet)
345 kV Double-Circuit	Monopole w/ Davit Arms	Galvanized or Self-Weathering Steel	150	90-160	7-12	1,000
345 kV Single-Circuit	Monopole with Davit Arms	Galvanized or Self-Weathering steel	150	90-150	7-12	1,000
345 kV Single-Circuit	H-Frame	Self-Weathering steel	150	75-150	5-8	1,000

The Applicants are currently evaluating two different conductor types for the new 345 kV transmission line which include: a double bundled 2x397.5 kcmil 26/7 ZTACSR "Ibis" conductor and a double bundled round (non-twisted pair) 954 kcmil 20/7 ACSS/TW "Cardinal" conductor.

The proposed transmission line will be designed to meet or surpass relevant local and state codes including the National Electric Safety Code (NESC) and the Applicants' standards. Applicable standards will be met for construction and installation, and applicable safety procedures will be followed during design, construction, and after installation.

2.6 Transmission Line Right-of-Way

The majority of the new 345 kV transmission circuit will be strung on existing infrastructure, using existing double-circuit capable structures already present within an existing 150-foot-wide transmission line right-of-way. The Applicants will require new 150-feet right-of-way for construction of the new structures and transmission lines in areas where the Proposed Route deviates from the existing transmission line right-of-way.

2.7 Project Schedule

Construction for the Project is expected to begin in the fourth quarter of 2024 or first quarter of 2025. The Applicants anticipate Project construction to be completed in the fourth quarter of 2027. Table 2.7-1 provides a permitting and construction schedule summary, with anticipated end dates identified.

Table 2.7-1 Anticipated Project Schedule

Activity	Estimated Dates
Minnesota Certificate of Need and Route Permit for Eastern Segment Issued	Second/Third Quarter 2024
Land Acquisition Begins	Third Quarter 2024
Survey and Transmission Line Design Begins	Second Quarter 2024
Other Federal, State, and Local Permits Issued	First Quarter 2025
Start Right-of-Way Clearing	Second Quarter 2025
Start Project Construction	Second Quarter 2025
Project In-Service	Fourth Quarter 2027

This schedule is based on information known as of the date of this filing and upon planning assumptions that balance the timing of implementation with the availability of crews, materials and other practical and seasonal considerations. This schedule may be subject to adjustment and revision as further information is developed.

2.8 Project Costs

Table 2.8-1 summarizes the Project will cost between $209.5 million and $238.2 million (in 2022 dollars) depending on the alignment selected.

Table 2.8-1 Current Construction Cost Estimates

Project Component	Capital Expenditures ($millions) (in 2022 dollars)	
	Low	High
Alexandria – Big Oaks 345 kV Transmission Line	$123.1	$130.9
Alexandria Substation Modifications	$20.0	$28.0
Riverview Substation Modifications	$3.0	$3.0
Quarry Substation Modifications	$3.0	$4.0
New Big Oaks Substation	$60.4	$72.3
Total Project Costs*	$209.5	$238.2

There may be differences between the sum of the individual component amounts and Total Project Costs due to rounding.

The Applicants note that Table 2.8-1 includes cost estimates (in 2022 dollars) to be consistent with MISO's estimates approved as part of MTEP21. These estimates will increase over time for any number of reasons such as, but not limited to escalation, inflation and commodity pricing, especially for these types of large-scale 345 kV transmission projects that have multi-year schedules. Therefore, the Applicants are also developing escalated cost estimates for each component of the Project in nominal dollars that will be shared during the course of this proceeding once they are available.

3 Route Selection Process

The Applicants conducted a route selection process beginning in late 2022 and extending through the middle of 2023. This process included consideration of statutory and rule requirements, information gathering, public outreach and input, and comparison of route alignment options around the Project substations. The main consideration during the route selection process was maximizing the use of the existing right-of-way between the Alexandria and Monticello Substations. As the majority of the new 345 kV transmission circuit will be placed on existing transmission line structures, the Proposed Route will follow existing transmission line right-of-way for over 95 percent of its length. As a result, the Proposed Route was already well defined for most of the Project. The focus of the route selection process centered on areas around the Big Oaks Substation Siting Area and the Mississippi River Crossing Options, as well as Project substation taps and bypasses.

The Applicants met with federal, state, and local agencies as part of the outreach program for the Project. The Applicants developed a Geographic Information System (GIS) database that contained information gathered from publicly available data resources as well as input from the public and agencies. This process resulted in the identification of a single route, and two options for the Mississippi River crossing.

3.1 Summary of Route Selection Process and Guiding Factors

Minn. Stat. § 216E.03, subd. 7(a) provides that the Commission's route permit determinations "must be guided by the state's goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state's electric energy security through efficient, cost-effective power supply and electric transmission infrastructure." Subdivision 7(e) of the same section requires the Commission to "make specific findings that it has considered locating a route for a high-voltage transmission line on an existing high voltage transmission route and the use of parallel existing highway right-of-way and, to the extent those are not used for the route, the Commission must state the reasons."

In addition to the statutory criteria noted above, Minn. Stat. § 216E.03, subd. 7(b) and Minn. R. 7850.4100 provide factors the Commission will consider in determining whether to issue a route permit for a HVTL. These factors are:

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

B. Effects on public health and safety;

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

D. Effects on archaeological and historic resources;

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

F. Effects on rare and unique natural resources;

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

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

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

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

K. Electrical system reliability;

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

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

N. Irreversible and irretrievable commitments of resources.

In 2023, the Minnesota Legislature amended Minn. Stat. § 216E.03, subd. 7(b) to also include the following considerations when designating routes:

- Evaluation of the benefits of the proposed facility with respect to (i) the protection and enhancement of environmental quality, and (ii) the reliability of state and regional energy supplies;

- Evaluation of the proposed facility's impact on socioeconomic factors; and

- Evaluation of the proposed facility's employment and economic impacts in the vicinity of the facility site and throughout Minnesota, including the quantity and quality of construction and permanent jobs and their compensation levels. The commission must consider a facility's local employment and economic impacts and may reject or place conditions on a site or route permit based on the local employment and economic impacts.

3.1.1 Project Study Area

The Project Study Area was designed to establish boundaries and limits for the information-gathering process (e.g., identifying environmental and land use resources, routing constraints, and routing opportunities) and the subsequent development of route options for the Project (Map 1). The Project Study Area was also used as the Project Notice Area for public outreach and developing mailing lists for Project updates and invitations to public open houses.

The Applicants developed the Project Study Area boundary by buffering the existing infrastructure alignment between the Alexandria Substation and the new proposed Big Oaks Substation by 0.5 mile, creating an area that covers approximately 120 square miles. The Project Study Area is approximately 100 miles long and 1 mile wide along the length of the of the existing infrastructure; it extends to 3 miles wide around the Big Oaks Substation Siting Area and around the Mississippi River Crossing Options (Map 1).

3.1.2 Identify Routing Opportunities and Constraints

The process of identifying potential routes started by first identifying areas where deviation from the existing infrastructure and right-of-way would be required. For the portions of the Project where the new 345 kV transmission line would be double-circuited on existing structures, it was determined there was no need for additional right-of-way; therefore, the proposed route width was established as identical to the existing 150-foot right-of-way.

In locations where the Project would deviate from the existing infrastructure, the Applicants identified alignments that would meet the Project needs of either bypassing an existing substation or tapping into a new or existing substation. These deviations were constrained to the start/end points along the existing infrastructure and limited the potential areas of new right-of-way.

To minimize impacts on the environment and affected landowners, the Applicants looked for routing opportunities on Applicants-owned land or that would share rights-of-way with existing transmission lines and field and section lines. The Applicants also examined the Project Study Area to identify routing constraints that should be avoided if practicable (e.g., airports, Wildlife Management Areas (WMAs), Waterfowl Production Areas (WPAs), residential subdivisions, lakes, etc.).

Based on an examination of routing opportunities and constraints, the Applicants developed a total of five proposed alignments at the four locations where deviations from the existing infrastructure is required; this includes one alignment at each of the existing substations (Alexandria, Riverview, and Quarry) and two alignment options at the Mississippi River crossing and tap into the new Big Oaks Substation.

A third Mississippi River Crossing Option east of the Monticello Nuclear Generating Plant was considered but rejected (Map 5). The alignment was rejected based on evaluation against the guiding factors outlined in Section 3.1 including effect on human settlement, recreation, tourism and costs of constructing, operating, and maintaining the facility. The rejected alignment is longer than the other two options, has greater linear impacts on the Mississippi Wild & Scenic River District and is more expensive. It also bisects and would disrupt long-standing research at the University of Minnesota Sand Plain Research Farm. Additionally, challenges and costs related to the construction, operation and maintenance of the alignment associated with crossing up to seven different existing transmission lines near the Monticello Substation and Monticello Nuclear Generating Plant led to the alignment's rejection by the Applicants.

3.1.3 Public Open House Meetings

Following the development of the Project Study Area and alignment options, the Applicants conducted four public open houses: one in-person in Alexandria, Minnesota at the Alexandria Holiday Inn, on April 11, 2023, from 4:00 to 7:00 p.m.;

one in-person in Becker, Minnesota at the Becker Community Center, on April 12, 2023, from 4:00 to 7:00 p.m.; and two virtual open houses on April 13, 2023 at 1:00 p.m. and 6:00 p.m. Notices for these open houses were provided via newspaper and direct mail to residents, landowners, public officials, tribes, and other potential stakeholders (Appendix E). The open house invitation provided information such as a general Project description, a map of the Project Study Area and anticipated alignments, the Project's website address, and Applicants' contact information to submit questions and comments.

The in-person open house format included several stations to display and communicate information about the Project to the attendees. Large-scale, poster-sized maps were on display depicting the Project Study Area and anticipated alignments. GIS stations were also available for meeting attendees to review specific locations in more detail and to print maps of areas of interest. Meeting attendees were encouraged to submit written comments either at the meeting or by email until April 30, 2023.

The virtual open house format included a 30-minute formal presentation and a 30-minute question and answer session. Meeting attendees were encouraged to ask questions or leave comments by either typing into the online system or calling and speaking directly to an Applicants representative. Virtual meeting attendees were also informed they could submit comments until April 30, 2023.

Landowner feedback from these open houses included comments and concerns regarding the following: proximity to residences; minimizing impacts to farm operations, and crop damage. The Applicants received two written comments during the in-person open houses. More information on the feedback received is available in Section 7.2.

3.1.4 Initial Local Government and Agency Outreach

Following development of the Project Study Area and Proposed Route, several meetings were held with federal, state, county, and local agencies and various county and local administrators. The purpose of these meetings was to gather feedback on the Proposed Route and alignment options and identify potential concerns. More details of the discussions with agency and county staff may be found in Section 7 of this Application.

4 Description of Proposed Route

The sections below provide a brief description of the Route, and Map 1 depicts the Project Route. Refer to Appendix C for detailed Route maps.

4.1 Project Route

4.1.1 Alexandria Substation Tap

The Proposed Route begins at the Alexandria Substation and includes a 500-foot buffer around the Alexandria Substation, as well as around a new tap line into the substation. The proposed tap line includes approximately 0.2 miles of new right-of-way and placement of one new structure.

4.1.2 Existing Transmission Line Second Circuit (Alexandria to Riverview Substation)

The Proposed Route narrows to 150 feet wide as it follows the existing transmission line right-of-way east then southeast for approximately 42 miles during which it crosses Interstate 94 four times and passes the cities of West Union and Melrose to the Riverview Substation near Freeport. Along this section, new 345 kV transmission line will primarily be double–circuited on existing structures. Approximately 25 new monopole structures will be needed, and the line will be strung on the new structures instead of double-circuiting on existing structures. These new structures will be built in the existing transmission line right-of-way and within 40-60 feet of an existing structure.

4.1.3 Riverview Substation Bypass

The Proposed Route widens to include a 500-foot buffer around the Riverview Substation and around a new bypass of the substation. The bypass includes approximately 0.5 miles of new right-of-way around the substation and placement of up to five new structures.

4.1.4 Existing Transmission Line Second Circuit (Riverview Substation to Quarry Substation)

The Proposed Route narrows back to 150 feet wide as it proceeds south from the Riverview Substation. It follows the existing transmission line right-of-way for approximately 9 miles then continues east for 26 miles, following the existing transmission line right-of-way past Rockville to the Quarry Substation at Waite Park.

Along this section, new 345 kV line will primarily be double–circuited on existing structures. This section requires construction of approximately 30 new monopole structures, and the line will be strung on the new structures instead of double-circuited on existing structures. These new structures will be built in the existing transmission line right-of-way and within 40-60 feet of an existing structure.

4.1.5 Quarry Substation Bypass

The Proposed Route widens to include a 500-foot buffer around the Quarry Substation, the existing infrastructure in and out of the Quarry Substation north of Old Hwy Road North, and around a new substation bypass. The bypass includes approximately 0.2 miles of new right-of-way around the substation and up to six new structures.

4.1.6 Existing Transmission Line Second Circuit (Quarry Substation to Big Oaks Substation Siting Area)

The Proposed Route narrows back to 150 feet as it proceeds south from the Quarry Substation, following the existing transmission line right-of-way to Interstate 94. The Proposed Route continues east for approximately 29 miles following the existing transmission line right-of-way past St. Cloud, St. Augusta, and Clearwater. It crosses Interstate 94 four times before reaching an area south of the Big Oaks Substation Siting Area, located west of the Monticello Nuclear Generating Plant. Along this section, new 345 kV transmission line will be double-circuited on existing structures; no new structures are required.

4.1.7 Big Oaks Substation Siting Area and Mississippi River Crossing Options

The Proposed Route widens to include 500-foot buffers around the two Mississippi River Crossing Options. The Proposed Route encompasses the area along the Mississippi River from the Western Crossing Option to east of the Monticello Nuclear Generating Plant and includes the 150-foot right-of-away of the existing infrastructure. The Proposed Route also includes the Big Oaks Substation Siting Area as well as a buffer ranging from 600 feet to almost 2,000 feet extending west from the Big Oaks Substation Siting Area to the Mississippi River.

5 Right-of-Way Acquisition, Construction, Restoration, and Maintenance Procedures

The Applicants developed right-of-way acquisition, construction, restoration, and maintenance procedures for the Project. Although certain procedures will be site-specific based upon the final route design, general procedures are discussed in some detail in this Application.

5.1 Right-of-Way Acquisition

Early in the detailed design process, typically after the route permit is obtained, the right-of-way acquisition process begins. For transmission lines, utilities typically acquire easement rights across the parcels to accommodate the transmission line. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation, and acquisition of easement rights.

In areas of the Project that will use existing rights-of-way and the terms of the existing easement are sufficient, the Applicants' right-of-way agent will work with the landowner to address any short-term construction needs, impacts, or restoration.

For portions of the Project where a new or expanded right-of-way will be necessary, the Applicants' right-of-way agent will identify all persons and entities that may have a legal interest in the identified real estate. The Applicants' right-of-way agent contacts each property owner to describe the need for the transmission facilities and how the Project may affect each parcel. The Applicants' right-of-way agent also seeks information from the property owner about any specific concerns that they may have with the Project.

To aid in the design and routing of the Project, Applicants may request permission to enter the property to conduct preliminary survey and geotechnical work. During this process, the location of the proposed transmission line or substation facility may be staked with permission of the property owner.

The agent will discuss the construction schedule and construction requirements with the property owner. Special consideration may be needed for fences, crops, or livestock. Fences and livestock may need to be moved; temporary or permanent gates may need to be installed; and crops may need to be harvested early. In each case, the

right-of-way agent and construction personnel coordinate these processes with the property owner.

Land value data will be collected to assist in determining the fair market value of the easement needed for the lands to be crossed by the Project as well as the impact the easement may have on the market value of those parcels. A fair market value offer will be developed that recognizes the impact of the easement to each parcel. Sometimes, a negotiated easement agreement cannot be reached. In those cases, the Applicants may exercise eminent domain pursuant to Minnesota law. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, typically, the Applicants must obtain at least one appraisal and provide a copy to the property owner. The property owner may also obtain another property appraisal and the Applicants must reimburse the property owner for the cost of the appraisal according to the requirements and limits set forth in Minn. Stat. § 117.036. To start the formal condemnation process, the Applicants file a petition in the district court where the property is and serves that petition on all owners with an interest in each of the properties identified in the petition.

If the district court grants the petition, the court then appoints a three-person condemnation commission that will determine a just compensation amount for the easement. The three people appointed to the condemnation commission must be knowledgeable of applicable real estate matters. The commissioners schedule a viewing of the property and then schedule a valuation hearing where the utilities and property owners offer their evidence, such as testimony by appraisers, as to the fair market value of the property interests required for the Project. The condemnation commission then makes an award as to the value of the property acquired for the easement and that award is filed with the court. Each party has the right to appeal the award to the district court for a jury trial. A jury trial typically occurs in the event of an appeal in which the jury considers the parties' evidence and renders a verdict. At any point in this process, the case can be dismissed if the parties reach a settlement.

There may be instances where a property owner elects to require the Applicants to purchase their entire property rather than acquiring only an easement for the transmission line. The property owner is granted this right under Minn. Stat. § 216E.12, subd. 4, which is sometimes referred to as the "Buy-the-Farm

Statute." The Buy-the-Farm Statute applies only to transmission lines that are 200 kV or more; thus, the Buy-the-Farm Statute may apply to parcels crossed by the proposed 345 kV transmission lines.

5.2 Construction Procedures

Construction will last approximately 18 to 20 months from start to finish and will employ approximately 100 to 150 construction workers.

Construction will begin after necessary federal, state, and local approvals are obtained and property rights are acquired for each respective segment. Construction in areas where new easements are not needed or have already been obtained may proceed while right-of-way acquisition for other areas are still in process. The precise timing of construction will consider various requirements of permit conditions, environmental restrictions, availability of outages for existing transmission lines (if required), available workforce, and materials.

Construction will follow the Applicants' best practices for construction and mitigation to minimize temporary and permanent impacts to land and the environment. Construction typically progresses as follows:

- survey marking of the right-of-way;
- right-of-way clearing and access preparation;
- grading or filling if necessary;
- installation of culverts or concrete foundations;
- installation of poles, insulators, and hardware;
- conductor stringing;
- installation of any aerial markers required by state or federal permits; and
- restoration / clean-up.

The Applicants will design the transmission line structures for installations at the existing grades. Where a site slope is required (typically on slopes exceeding 10 percent), working areas may be graded or leveled with fill. If acceptable to the

property owner, the Applicants proposes to leave the graded/leveled areas after construction to allow access for future maintenance activities. If not acceptable to the property owner, the Applicants will, to the best of its ability, return the grade of the site back to its original condition.

Construction will require the use of many different types of construction equipment including tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, drill rigs, dump trucks, front-end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete trucks, helicopters, and various trailers or other hauling equipment. Excavation equipment is often on wheeled or track-driven vehicles. Construction crews will attempt to use equipment, when opportunities are available, that minimizes impacts to land, including the use of ground mats if required.

Construction staging areas/laydown yards are usually established for transmission projects. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. Construction of each segment will likely include two or more staging areas. Structures, conductor, matting and other materials are delivered to staging areas and stored until they are needed for the Project.

The Applicants will evaluate construction access opportunities by identifying existing transmission line easements, roads, or trails that are near the approved route. When feasible, the Applicants will limit construction activities to the easement area. In certain circumstances, additional off-easement access may be required on a temporary basis. Permission will be obtained from property owners prior to using off-easement access.

Improvements to existing access or construction of new access may be required to accommodate construction equipment. Field approaches and roads may be constructed or improved. Where applicable, the Applicants will obtain permits for new access from local road authorities. The Applicants will also work with appropriate road authorities to ensure proper maintenance of roadways traversed by construction equipment.

After right-of-way clearing and access preparation has been completed, pole and foundation installation will begin. Structures for the Project will require drilled pier concrete foundations.

Drilled pier foundations are typically between eight to ten feet in diameter and are typically 20 to 60 feet deep, depending on soil conditions. An angle or dead-end structure may require a foundation up to 12 feet in diameter. The actual diameter and depth of the hole (and foundation) depend on structure design and soil conditions that are determined during the initial survey and soil testing phases. Concrete is brought to the site by concrete trucks from a local concrete batch plant and filled around a steel rebar support cage and anchor bolts. Once the foundation is cured, the structure is bolted to the foundation.

Structures will be moved from staging areas and delivered to the site of each foundation where they are assembled. Using a crane, the structure is lifted and placed into position. Insulators and other hardware are attached to the structure prior to placing it on the foundation.

Conductor stringing is the last major step of transmission line construction. Stringing setup areas are typically located at two-mile intervals. These sites are located within the right-of-way, when possible, or within temporary construction easements. Conductor stringing often use helicopters to start the process by pulling a "sock-line" or high strength rope through pulleys attached to the insulators on each structure that is attached to the conductors which are pulled into place and sagged to meet design requirements that are compliant with good utility practice and minimum code clearances. This process requires brief access to each structure to secure the conductor wire to the insulator hardware and to fasten the shield wire on each structure. After conductor installation is complete, conductor marking devices will be installed if required. These marking devices may include bird flight diverters or air navigational markers. The Applicants will work with the appropriate agencies to identify locations where marking devices need to be installed.

Where the transmission line crosses streets, roads, highways, or other energized conductors or obstructions, temporary guard or clearance poles may be installed before conductor stringing. The temporary guard or clearance poles ensure that conductors will not obstruct traffic or contact existing energized conductors or other cables during stringing operations and also protects the conductors from damage if they were to fall during stringing.

Some soil conditions and environmentally sensitive areas will require special construction techniques. The most effective way to minimize impacts to these areas

will be to avoid placing poles in the sensitive areas by spanning over wetlands, streams, and rivers. When it is not feasible to avoid traversing sensitive areas, one or more of the following options will be used to minimize impacts, in consultation with the appropriate agencies:

- When possible, construction will be scheduled during frozen ground conditions;
- When construction during winter is not possible and conditions require, construction mats will be used where wetlands and other sensitive areas would be impacted;
- Equipment fueling and other maintenance will occur away from environmentally sensitive and wet areas. These construction practices help ensure that fuel and lubricants do not enter waterways or impact environmentally sensitive areas; and
- Various best management practices (BMPs) will be identified in the Project's Stormwater Pollution Prevention Plan (SWPPP), including the use of silt fences, bio logs, erosion control blankets with embedded seeds, and other sound water and soil conservation practices to protect topsoil and adjacent water resources and to minimize soil erosion.

These techniques are also used to reduce impacts to private property including driveways, yards, and drain tile.

5.3 Restoration and Clean-up Procedures

Crews will attempt to minimize ground disturbance whenever feasible, but areas will be disturbed during the normal course of work. Once construction is completed in an area, disturbed areas will be restored to their original condition to the maximum extent feasible. Temporary restoration before the completion of construction in some areas along the right-of-way may be required per National Pollutant Discharge Elimination System (NPDES) and Minnesota Pollution Control Agency (MPCA) construction permit requirements.

After construction activities have been completed, a utility representative will contact the property owner to discuss any damage that has occurred as a result of the Project.

This contact may not occur until after the Applicants have started restoration activities. If fences, drain tile, or other property have been damaged, the Applicants will repair damages or reimburse the landowner to repair the damages.

Farmers will be compensated for crop losses caused by Project construction. The compensation will be based upon the area(s) affected, the typical yield for the crops lost, and the market rates for those crops. Following an approved Agricultural Impact Mitigation Plan (AIMP) (Appendix F), a utility representative will measure the area(s) in which planted crops were damaged or destroyed, or not planted at the Applicants' request. The lost yields will be determined in coordination with the property owner. The market rate will also be determined in coordination with the property owner and local elevator and/or other evidence to determine the appropriate rate of payment. The Applicants will also make a payment for future year crop loss due to soil compaction. In addition, property owners will be compensated for their expense to deep rip compacted areas. If an individual does not have access to deep ripping equipment, the Applicants will provide this service or access to such equipment.

Ground-level vegetation disturbed or removed from the right-of-way during construction of the Project will naturally reestablish to pre-construction conditions. Additionally, vegetation that is consistent with substation site operation outside the fenced area will be allowed to reestablish naturally at substation sites. Areas where significant soil compaction or other disturbance from construction activities occur will require additional assistance in reestablishing the vegetation stratum and controlling soil erosion. In these areas, the Applicants will use seed that is noxious weed free to reestablish vegetation.

Another aspect of restoration relates to the roads used to access staging areas or construction sites. After construction activities are complete, the Applicants will ensure that township, city, and county roads used for purposes of access during construction will be restored to their prior condition. The Applicants will meet with township road supervisors, city road personnel, or county highway departments to address any issues that arise during construction with roadways to ensure the roads are adequately restored, if necessary, after construction is complete.

5.4 Maintenance Procedures

Transmission lines and substations are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation. The Applicants will be responsible for the operation and maintenance of this Project. The Applicants perform aerial annual inspections of the existing infrastructure and inspects the line from the ground every six years. Typically, one to two workers are required to perform aerial inspections and three workers are required to perform the ground inspections. Any defects identified during these inspections will be assessed and corrected. The Applicants will also perform necessary vegetation management for the line. Vegetation maintenance generally occurs every four years.

Line inspections are the principal operating and maintenance cost for transmission facilities. The aerial inspections cost approximately $75-$100 per mile and the ground inspections cost approximately $200-$400 per mile. Actual line specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

The estimated service life of the proposed transmission line for accounting purposes varies among utilities. The Applicants use an approximately 60-year service life for its transmission assets. However, practically speaking, HVTLs are seldom completely retired.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The substation site must be kept free of vegetation and adequate drainage must be maintained.

Western Minnesota will be responsible for the operation and maintenance of the Alexandria Substation, Great River Energy will be responsible for the operation and maintenance of the Riverview Substation, and Xcel Energy will be responsible for the operation and maintenance of the new Big Oaks Substation.

5.5 Storm and Emergency Response and Restoration

Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of

outages due to severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail. Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the line. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99%.

However, unplanned outages of transmission facilities can happen for a variety of reasons. Unplanned outages can occur due to mechanical failures or severe weather like heavy ice, wind, and lightning. In the event an unplanned outage of any facility along the Project occurs, Applicants have the necessary infrastructure and crews in place in order to respond quickly and safely to return these facilities to service.

6 Environmental Information

This section provides a general description of the environmental and human setting of the Applicants' Proposed Route. Topics discussed in the following subsections include environmental setting, existing land cover and land use, soils, human settlement, land-based economies, archaeological and historical resources, hydrologic features, vegetation and wildlife, and rare and unique natural resources that are known to occur or may potentially occur along the Proposed Route.

In addition to identifying existing resources, the potential effect(s) on those resources are discussed, and measures that can be used to avoid, minimize, or mitigate effects are included where possible. Where specific, quantified, impacts are discussed, the Applicants reports these for each of the Project Components discussed in Section 2.2 and named accordingly below. The associated facilities are accounted for within the Proposed Route requested in this Application.

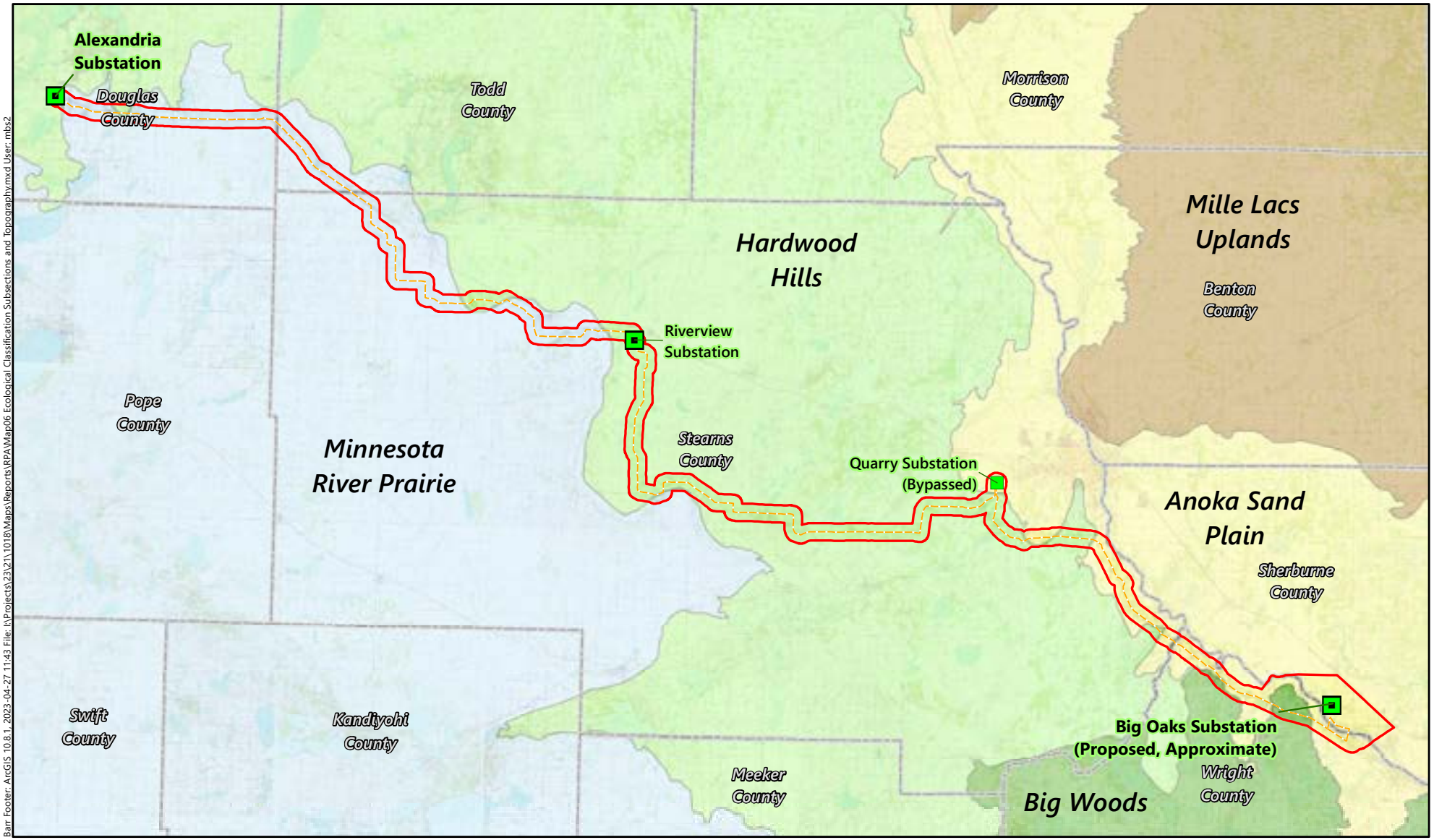
- Existing Transmission Line Second Circuit
- Alexandria Substation Tap
- Riverview Substation Bypass
- Quarry Substation Bypass
- Big Oaks Substation
- Mississippi River Crossing Options

For purposes of evaluating potential impacts of the Proposed Route, the Applicants have developed what they currently believe to be the likely alignments that minimize the overall potential impacts based on the routing factors identified in Minn. Stat. § 216E.03, subdivision 7(b), and Minn. R. 7850.4100. These alignments are referred to as the "anticipated alignment(s)". These anticipated alignments may require modifications after a Route Permit is issued due to limitations inherent in identifying an alignment absent detailed survey and engineering work, site review, and design. The anticipated alignments are detailed in Appendix C.

6.1 Environmental Setting

The Minnesota Department of Natural Resources (MDNR) and the U.S. Fish and Wildlife Service (USFWS) have developed an Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features (reference (2)). Through the ECS, the state of Minnesota is split into Ecological Provinces, Sections, and Subsections.

Under this classification system, the Proposed Route is mainly located in the Minnesota and NE Iowa Morainal Section of the Eastern Broadleaf Forest Province. A portion of the Proposed Route is also located in the North Central Glaciated Plains Section of the Prairie Parkland Province. These sections are further broken down into subsections. Those subsections crossed by the Proposed Route include the Hardwood Hills, Anoka Sand Plain, Big Woods, and Minnesota River Prairie (Map 6). General physiography and geomorphology for each subsection is outlined below.



Barr Footer: ArcGIS 10.8.1, 2023-04-27 11:43 File: I:\Projects\23\21\1018\Maps\Reports\RPA\Map06 Ecological Classification Subsections and Topography.mxd User: mbs2

Project Study Area
Anticipated Alignment
Project Substation
Bypassed Substation
County Boundary

Ecological Classification Subsection
Anoka Sand Plain
Big Woods
Hardwood Hills
Mille Lacs Uplands
Minnesota River Prairie

N

Miles
8 0 8

Data Source: Minnesota DNR - Division of Forestry

Map 6

ECOLOGICAL CLASSIFICATION SUBSECTIONS AND TOPOGRAPHY
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application

6.1.1 Existing Transmission Line Second Circuit

The Project consists mainly of adding a second 345 kV transmission line circuit to existing 345 kV double-circuit capable structures. Within the Eastern Broadleaf Forest Province, the Proposed Route begins in the Hardwood Hills Subsection of the Minnesota and NE Iowa Morainal Section. The Proposed Route then travels eastward, crossing into the Minnesota River Prairie Subsection of the North Central Glaciated Plains Section, within the Prairie Parkland Province. The Proposed Route continues eastward, crossing back and forth between the Harwood Hills and Minnesota River Prairie Subsections several times. Eventually, the Proposed Route passes into the Anoka Sand Plain Subsection of the Minnesota and NE Iowa Morainal Section within the Eastern Broadleaf Forest Province. A small portion (approximately 2.5 miles) of the eastern end of the Proposed Route crosses the Big Woods Subsection of the Minnesota and NE Iowa Morainal Section within the Eastern Broadleaf Forest Province. The Proposed Route then terminates within the Anoka Sand Plain Subsection.

The Hardwood Hills subsection is characterized by steep slopes, high hills, and lakes formed in glacial end moraines and outwash plains (reference (2)). During the Wisconsin age glaciation, ice stagnation moraines, end moraines, ground moraines, and outwash plains were formed in this subsection. Kettle lakes are abundant within the moraines and outwash deposits and there are over 400 lakes greater than 160 acres in size within this subsection. Most of this subsection is covered in 100 to 500 feet of glacial drift over diverse bedrock. Loamy soils are dominant, with loamy sands and sandy loams on outwash plains to loams and clay loams on moraines.

The Minnesota River Prairie subsection is characterized by large till plains that are bisected by the broad valley of the Minnesota River (reference (2)). The Minnesota River was formed by Glacial River Warren, which drained Glacial Lake Agassiz. Topography is steepest along the Minnesota River and the Big Stone Moraine, which has steep kames and broad slopes, while topography outside of the river valley consists of level to gently rolling ground moraine. Glacial drift generally ranges between 100 and 400 feet throughout this subsection. Soils are predominantly well-to-moderately well-drained loams formed in gray calcareous till of the Des Moines lobe with some localized inclusions of clayey, sandy, and gravelly soils. Wetlands were common within this subsection prior to Euro-American settlement, and most have been drained to establish usable cropland.

The Anoka Sand Plain subsection is characterized by flat, sandy lake plains and terraces along the Mississippi River, which forms the western boundary of the subsection, separating it from the Hardwood Hills and Big Woods subsections (reference (2)). Landforms in the Anoka Sand Plain consist of small dunes, kettle lakes, and tunnel valleys that create a level to gently rolling topography. Sandy terraces are found along the Mississippi River and its tributaries throughout the subsection. Bedrock outcrops can be found near St. Cloud and, in general, surface glacial deposits are less than 200 feet thick. Soils in the subsection are generally sandy, droughty upland soils with some organic soils in ice block depressions and tunnel valleys and poorly drained prairie soils along the Mississippi River.

The Big Woods subsection is characterized by a large block of deciduous forest present at the time of Euro-American settlement (reference (2)). Topography is gently to moderately rolling, and the primary landform is a loamy mantled moraine formed by the Des Moines lobe of the late Wisconsin glaciation. Circular, level-topped hills with smooth side slopes dominate the landscape, with broad level areas between the hills that contain closed depressions with lakes and peat bogs. Soils are predominantly loamy and range from loam to clay loam formed by the calcareous glacial till of the Des Moines lobe, with depth to bedrock ranging between 100 and 400 feet.

6.1.1.1 Alexandria Substation Tap

The Alexandria Substation Tap is within the Hardwood Hills Subsection of the Minnesota and NE Iowa Morainal Section, in the Eastern Broadleaf Forest Province. As discussed above, the Hardwood Hills Subsection is characterized by steep slopes, high hills, and lakes formed in glacial end moraines and outwash plains (reference (2)). Loamy soils are dominant, with loamy sands and sandy loams on outwash plains to loams and clay loams on moraines.

6.1.1.2 Riverview Substation Bypass

The Riverview Substation Bypass is within the Hardwood Hills Subsection of the Minnesota and NE Iowa Morainal Section, in the Eastern Broadleaf Forest Province. As the Riverview Substation Bypass is in the same ecological province, section, and subsection as the Alexandria Substation Tap, the description of the environmental setting provided in the Alexandria Substation Tap heading also applies here.

6.1.1.3 Quarry Substation Bypass

The Quarry Substation Bypass is within the Anoka Sand Plain subsection of the Minnesota and NE Iowa Morainal section, in the Eastern Broadleaf Forest Province. As discussed above, the Anoka Sand Plain subsection is characterized by flat, sandy lake plains and terraces along the Mississippi River. Soils in the subsection are generally sandy, droughty upland soils with some organic soils in ice block depressions and tunnel valleys and poorly drained prairie soils along the Mississippi River.

6.1.1.4 Big Oaks Substation

The Big Oaks Substation is within the Anoka Sand Plain subsection of the Minnesota and NE Iowa Morainal section, in the Eastern Broadleaf Forest Province. As the Big Oaks Substation is also in the same ecological province, section, and subsection as the Quarry Substation Bypass, the description of the environmental setting provided in the Quarry Substation Bypass heading also applies here.

6.1.1.5 Mississippi River Crossing Options

The Mississippi River Crossing Options are located within the Anoka Sand Plain subsection of the Minnesota and NE Iowa Morainal section, in the Eastern Broadleaf Forest Province. As the Mississippi River Crossing Options are also in the same ecological province, section, and subsection as the Quarry Substation Bypass, the description of the environmental setting provided in the Quarry Substation Bypass heading also applies here.

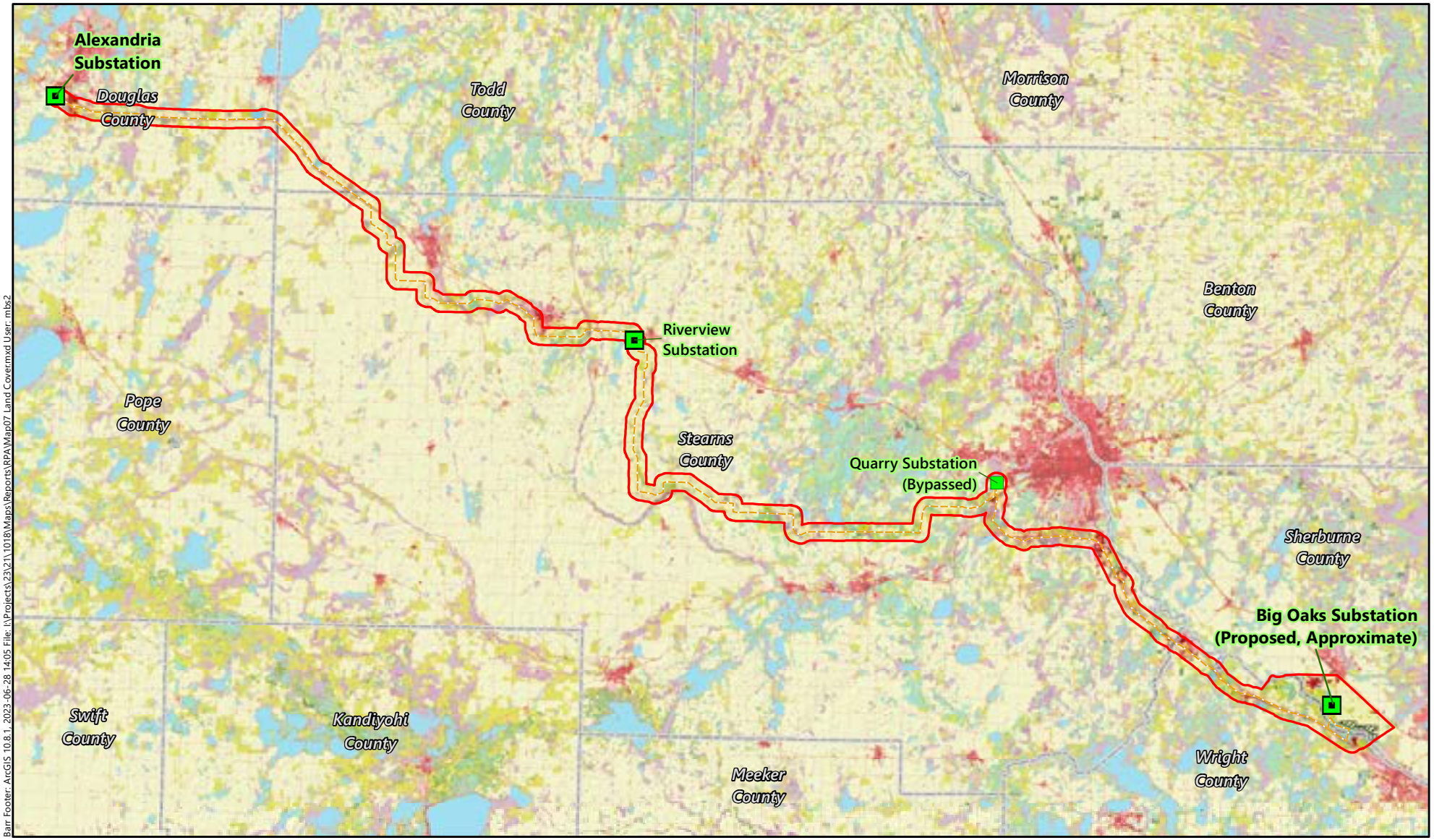
6.2 Land Cover and Land Use

According to the 2019 National Landcover Database – Land Use-Land Cover dataset, cultivated cropland is the dominant land cover making up 35 percent of the Proposed Route (Table 6.2-1, Map 7), indicating that the property within the Proposed Route is primarily used for agricultural purposes. Deciduous forest and hay/pastureland are the second and third most dominant land cover categories accounting for 19 percent and 14 percent of the Proposed Route. The remaining 13 land cover classifications collectively make up 32 percent of the Proposed Route.

Table 6.2-1 Land Cover in the Proposed Route

Land Use Category	Proposed Route Acres (Percent)[1]
Barren Land	3.7 (<1%)
Cultivated Crops	1,348.9 (35.3%)
Deciduous Forest	739.8 (19.3%)
Developed, High Intensity	83.1 (2.2%)
Developed, Low Intensity	222.7 (5.8%)
Developed, Medium Intensity	127.0 (3.3%)
Developed, Open Space	98.4 (2.6%)
Emergent Herbaceous Wetlands	211.4 (5.5%)
Evergreen Forest	7.3 (<1%)
Hay/Pasture	549.2 (14.4%)
Herbaceous	66.01 (1.7%)
Mixed Forest	4.5 (<1%)
Open Water	246.4 (6.4%)
Shrub/Scrub	13.9 (<1%)
Woody Wetlands	102.8 (2.7%)

[1] Values have been rounded and may not equal 100 percent.



Barr Footer: ArcGIS 10.8.1, 2023-06-28 14:05 File: I:\Projects\23\21\1018\Maps\Reports\RPA\Map07 Land Cover.mxd User: mbs2

Land Cover (NLCD, 2019)

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Med. Intensity
- Developed, High Intensity
- Barren Land
- Decidious Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceous Wetlands

- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- University of Minnesota Sand Plain Research Farm
- County Boundary

Miles

0 8

Data Source:
Multi-Resolution Land Characteristics (MRLC) Consortium, University of Minnesota

Map 7

LAND COVER

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

6.2.1 Impacts and Mitigation

The Project is not anticipated to significantly alter the existing land use or land cover within the Proposed Route. The Proposed Route follows existing transmission line right-of-way for approximately 95 to 99 percent of the Project length depending on the Mississippi River Crossing Option selected. The majority of the Project will also not require any new transmission line structures as the new 345 kV transmission line circuit will be double-circuited on existing double-circuit capable structures that currently hold only one 345 kV circuit. Impacts associated with each Project Component are described below.

6.2.1.1 Existing Transmission Line Second Circuit

Because the Project consists largely of stringing a second circuit onto existing infrastructure, there will be no changes in the land cover or land use along the Proposed Route.

6.2.1.2 Alexandria Substation Tap

The existing substation is surrounded by cultivated cropland. A small, forested area is east of the substation, and a lake is directly south of the substation (Map 2). Additional impacts to land use/land cover may occur in order to accommodate expansion of the Alexandria Substation.

The new transmission line connection into the Alexandria Substation will result in the installation or relocation of structures within the adjacent agricultural field and will require some tree removal within the adjacent wooded area. It is estimated that the new structure would result in a loss of approximately 115 square feet of cultivated cropland. These impacts are anticipated to be minimal and will result in negligible loss of cultivated cropland and wooded habitat.

6.2.1.3 Riverview Substation Bypass

The Riverview Substation is surrounded by cultivated cropland. The existing circuit will be reconfigured to bypass the Riverview Substation and the new circuit will connect to the Riverview Substation (Map 3). The substation bypass will result in temporary disturbance of cultivated cropland from construction of the new transmission line, including the addition of five new structures resulting in the loss of approximately 575 square feet of cultivated cropland. In addition, the Riverview Substation will be expanded approximately 0.5 acres on Great River Energy-owned

property to accommodate new substation equipment. Additional impacts to land use/land cover may occur in order to accommodate this expansion.

6.2.1.4 Quarry Substation Bypass

The Quarry Substation bypass area consists of wooded shelterbelts surrounded by cultivated cropland. The new transmission line would be routed around the eastern edge of the Quarry Substation (Map 4). This substation bypass would require the removal of approximately 1.2 acres of woody vegetation within the 150-foot right-of-way. In addition, the Quarry Substation will be expanded approximately 0.3 acres on Xcel Energy-owned property to accommodate new substation equipment. Additional impacts to land use/land cover may occur in order to accommodate this expansion. Once construction is complete the Applicants will be responsible for maintenance of the permanent right-of-way and would conduct regular tree trimming to remove large woody debris from the right-of-way, resulting in a permanent conversion of this land use from idled woodland to a utility corridor.

6.2.1.5 Big Oaks Substation

The proposed Big Oaks Substation would be located within land owned primarily by Xcel Energy on what is now used as cultivated cropland (Map 5). Construction of the Big Oaks Substation would result in the conversion of 10 acres of cultivated cropland owned primarily by Xcel Energy into industrial land use.

6.2.1.6 Mississippi River Crossing Options

The Western Crossing Option spans approximately 0.7 miles of land adjacent to the Mississippi River and would disturb grassland with a mix of trees and shrubs. Similarly, the Eastern Crossing Option would include construction of approximately 2.1 miles of new transmission line and would disturb grassland and floodplain forest adjacent to the Mississippi River (Map 5).

Once construction is complete, the permanent rights-of-way of the selected Route option would be maintained as a utility right-of-way corridor, resulting in a permanent conversion of land use.

6.3 Human Settlement

Transmission lines have the potential to impact human settlements during their construction and operation. Resources related to human settlement and their potential impacts are discussed in more detail below.

6.3.1 Proximity to Residences

6.3.1.1 Existing Transmission Line Second Circuit

NESC and Applicants' standards require certain clearances between transmission line facilities and buildings for safe operation of a transmission line. In areas where the Project will require new right-of-way, the Applicants will acquire additional right-of-way that is sufficient to maintain these clearances. Displacement can occur when an existing structure is within the right-of-way for a new transmission facility.

Barr Engineering Co. (Barr) completed a desktop review to identify any residences located within 500 feet of the anticipated alignment. The review identified 154 residences within 500 feet of the anticipated alignment (Table 6.3-1). There are no residences located within 500 feet of the new segments of right-of-way for the proposed 345 kV transmission line. Map 8 identifies the locations of known residences within various distances from the maximum corridor sharing alignment within the Proposed Route.

There is one residence located approximately 75 feet from the existing 345 kV transmission line in Saint Cloud, Minnesota. This residence would not be displaced from stringing the additional circuit at this location.

Table 6.3-1 Proximity of Residences to the Anticipated Alignment

Proximity to Anticipated Alignment (ft)	Number of Residences from Anticipated Alignment					
	Existing Transmission line	Alexandria Substation Tap	Riverview Substation Bypass	Quarry Substation Bypass	Big Oaks Substation	Mississippi River Crossing
<75	1	0	0	0	0	0
75-300	76	0	0	0	0	0
300-500	77	0	0	0	0	0
Total Residences	154	0	0	0	0	0

6.3.1.1.1 Alexandria Substation Tap

There are no residences within 500 feet of the Alexandria Substation Tap (Table 6.3-1). The nearest residence within the Proposed Route is 0.9 miles southeast of the Alexandria Substation (Map 8).

6.3.1.1.2 Riverview Substation Bypass

There are no residences within 500 feet of the Riverview Substation Bypass (Table 6.3-1). The nearest residence within the Proposed Route is 2 miles south of the Riverview Substation Bypass (Map 8).

6.3.1.1.3 Quarry Substation Bypass

There are no residences within 500 feet of the Quarry Substation Bypass (Table 6.3-1). The nearest residence within the Proposed Route is 0.9 miles southwest of the Quarry Substation Bypass (Map 8).

6.3.1.1.4 Big Oaks Substation

The Big Oaks Substation will be located on land owned primarily by Xcel Energy. There are no residences within 500 feet of the substation and siting the final location of the substation will not result in any displacement of residences (Table 6.3-1, Map 8).

6.3.1.1.5 Mississippi River Crossing Options

There are no residences within 500 feet of the Mississippi River Crossing Options (Table 6.3-1). The nearest residence to the river crossing options is 800 feet west of the Western Crossing Option (Map 8).

Barr Footer: ArcGIS 10.8.1, 2023-07-14 12:31 File: I:\Projects\23\21\1018\Maps\Reports\RPA\Map08 Proximity to Residences.mxd User: amm

Residence within 500 Feet of Application Alignment
Project Study Area
Anticipated Alignment
Project Substation
Bypassed Substation

Interstate Highway
US Highway
State Highway
County State-Aid Highway
Municipal Boundary
County Boundary
State Boundary

Miles
8 0 8

Map 8

PROXIMITY TO RESIDENCES
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application

6.3.1.2 Impacts and Mitigation

Most of the Project transmission line will be double-circuited along existing infrastructure and will not affect residences within the surrounding area. The new segments of the 345 kV transmission line will be designed so that all existing residences will be located outside of the required right-of-way, to the extent feasible. The Project is not anticipated to displace any residences.

6.3.2 Public Health and Safety

Public health and safety will be a priority during the construction, operation, and maintenance of the Project. The Project will be designed according to local, state, and NESC standards regarding ground clearance, crossing utilities clearance, building clearance, strength of materials and right-of-way widths. Construction crews and/or contract crews will comply with local, state, and NESC standards regarding facility installation and standard construction practices. Established Applicants' and industry safety procedures will be followed during and after installation of the transmission line, including clear signage during all construction activities.

The proposed transmission line will be equipped with protective devices (circuit breakers and relays located in substations where transmission lines terminate) to safeguard the public in the event of an accident, or if the structure or conductor falls to the ground. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation facilities will be properly fenced and accessible only by authorized personnel.

6.3.2.1 Electric and Magnetic Fields and Stray Voltage

Electric and magnetic fields (EMF)s are invisible areas of energy associated with use of electrical power. For the lower frequencies associated with power lines (referred to as ELF), EMF should be considered separately – electric fields and magnetic fields, measured in kV/m and milligauss (mG), respectively. Electric fields are dependent on the voltage of a transmission line and magnetic fields are dependent on the current carried by a transmission line. The strength of the electric field is proportional to the voltage of the line, and the intensity of the magnetic field is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (cycles per second).

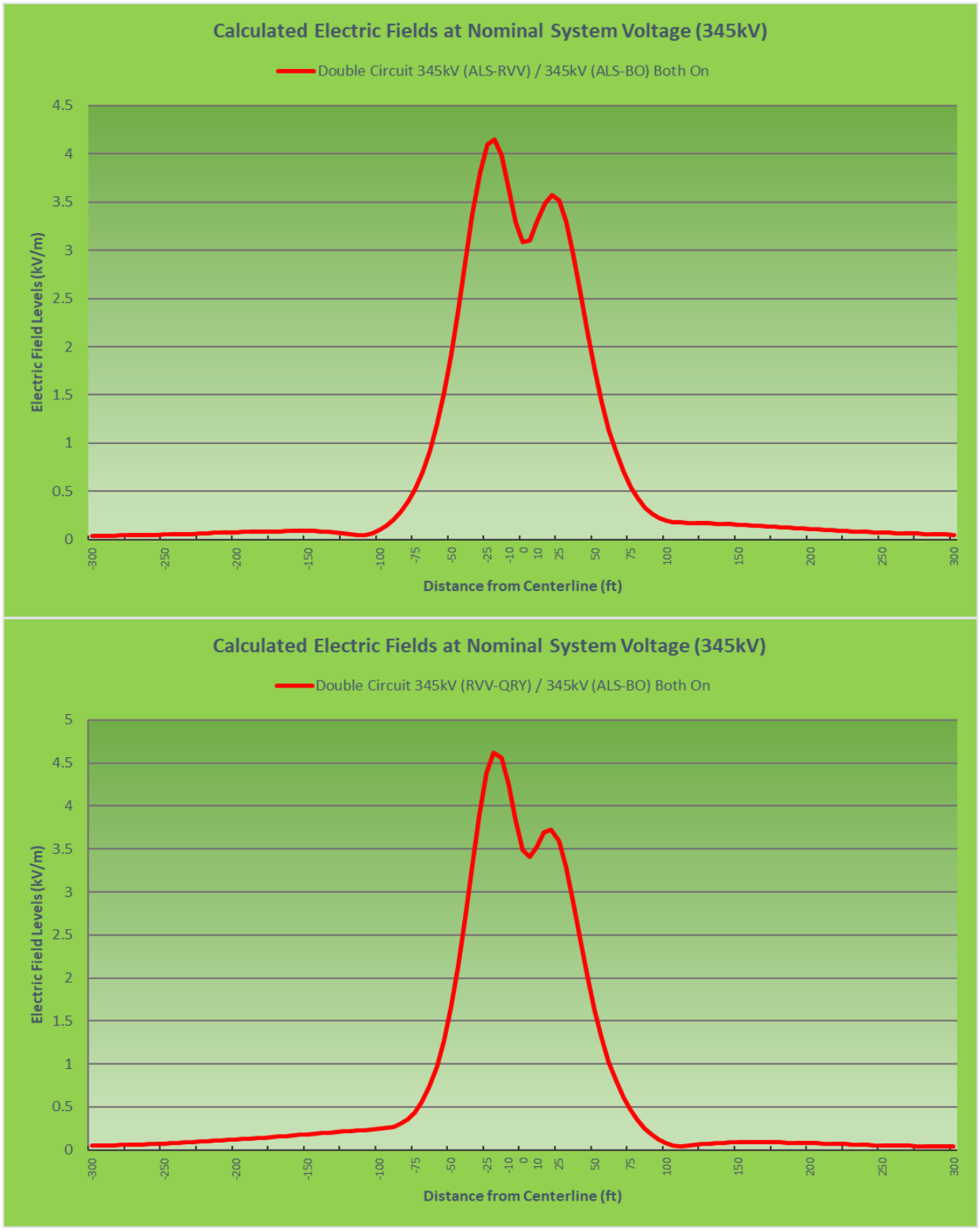
6.3.2.2 Electric Fields

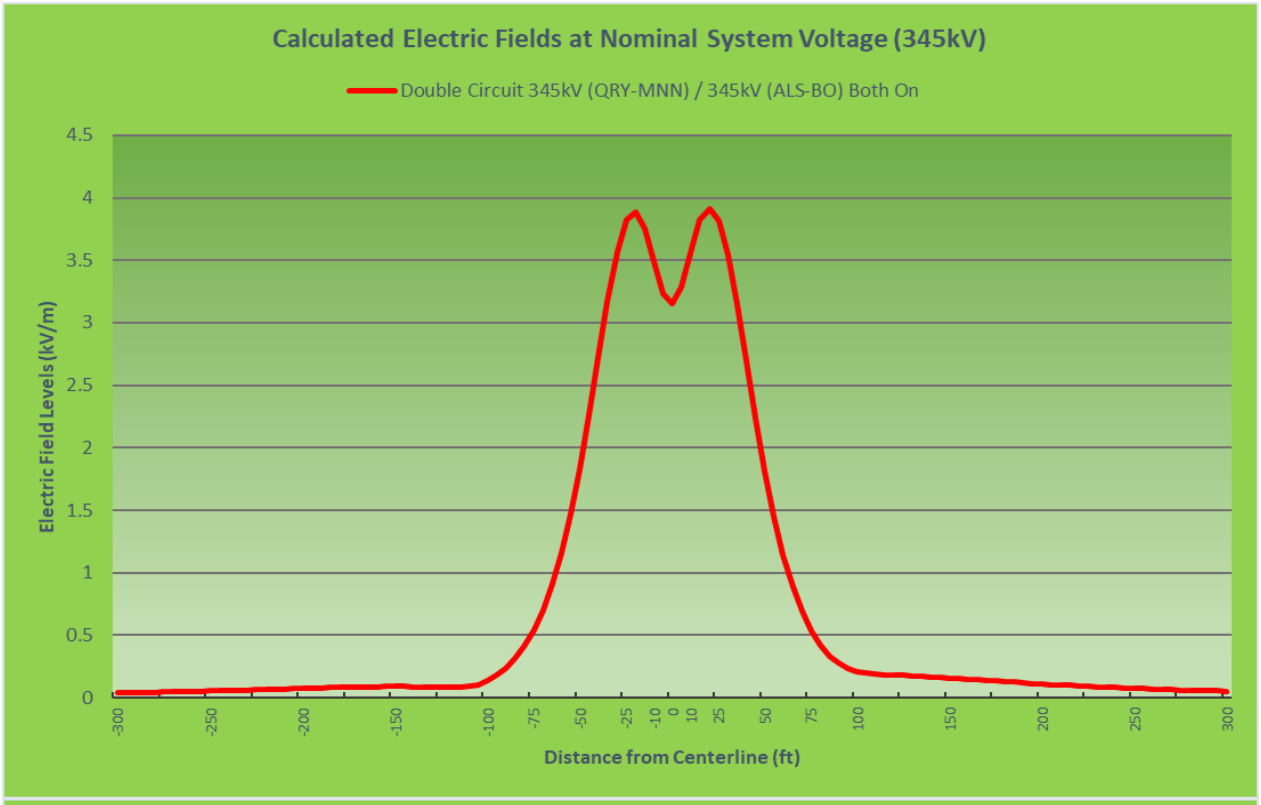
There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground (reference (3)). The standard was designed to prevent serious hazards from shocks when touching large objects parked under alternating current transmission lines of 500 kV or greater. Figure 6.3-1 provides the electric fields at maximum conductor voltage for the proposed 345 kV transmission line. Maximum conductor voltage is defined as the nominal voltage plus five percent. The maximum electric field, measured at one meter (3.28 feet) above ground, associated with the Project is calculated to be 4.62 kV/m. As shown in Figure 6.3-1, the strength of electric fields diminishes rapidly as the distance from the conductor increases. The electric field values of the 345 kV/345 kV double-circuit monopole design option at the edge of the transmission line right-of-way and sample points beyond are shown in Table 6.3-2.

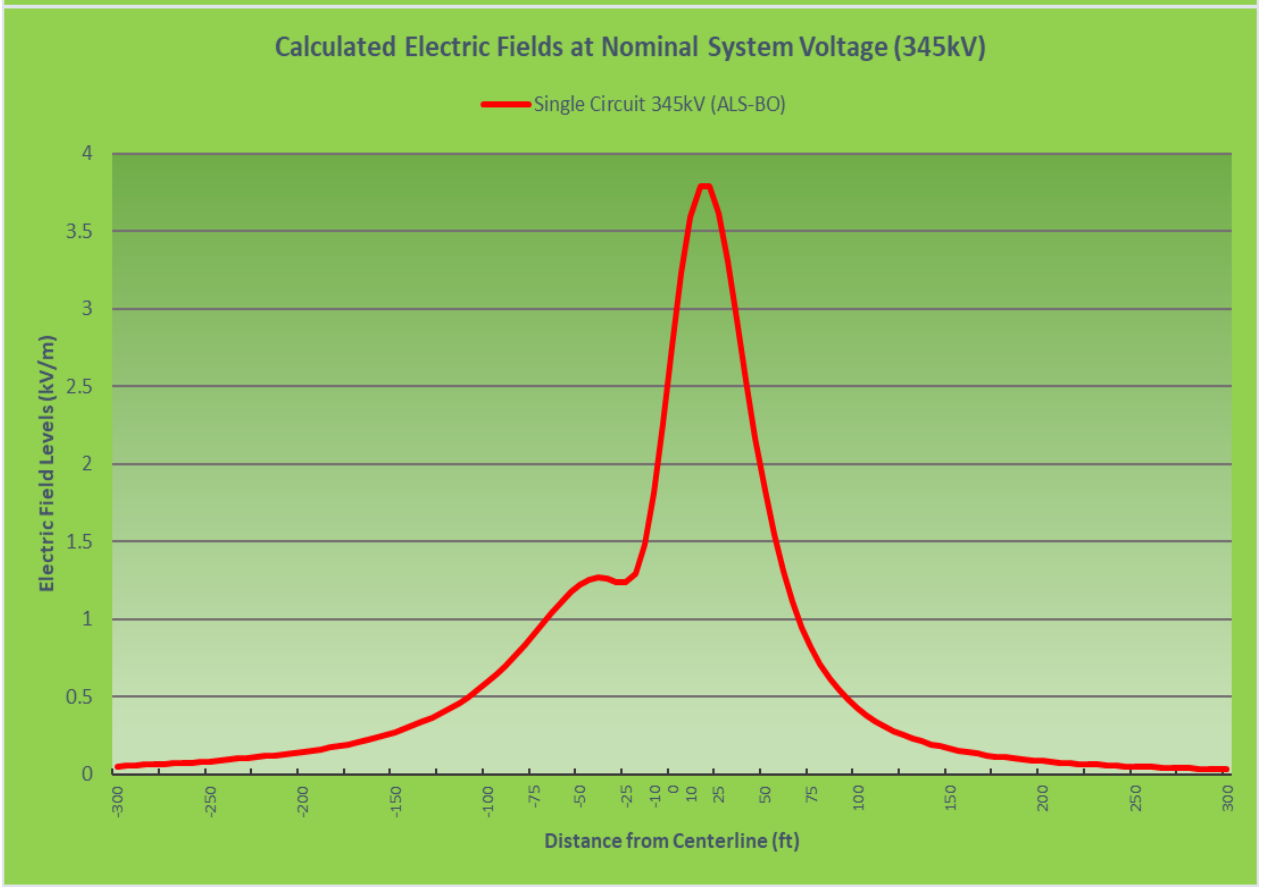
Table 6.3-2 Electric Field Calculations Summary (kV/m)

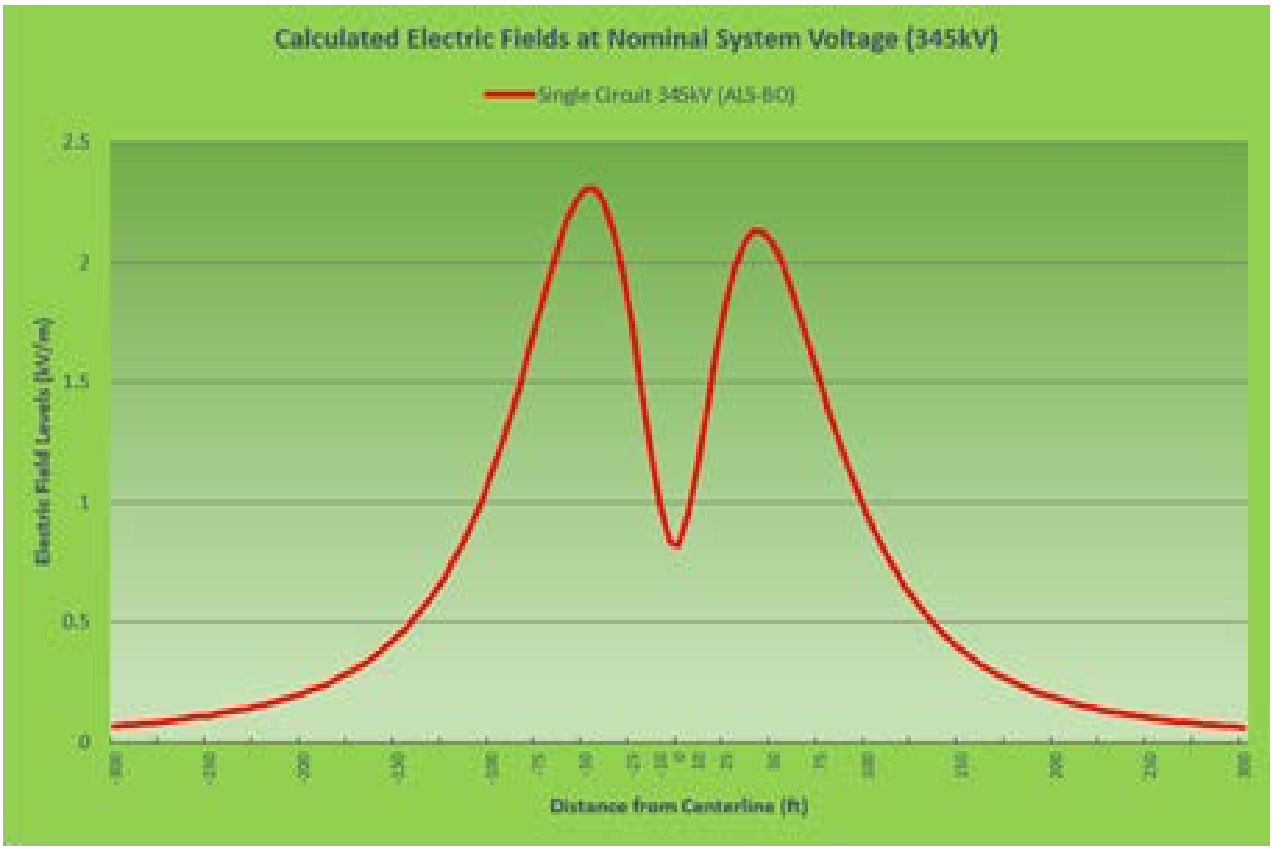
Structure Type	Circuits Present	Maximum Voltage	Distance to Proposed Alignment (feet)												
			-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
345 kV/345 kV Double-Circuit Monopole	Alexandria (ALS) – Riverview (RVV) Alexandria (ALS) – Big Oaks	362 kV	0.04	0.08	0.10	0.53	1.91	4.10	3.08	3.52	1.77	0.54	0.20	0.11	0.05
345 kV/345 kV Double-Circuit Monopole	Riverview (RVV) – Quarry (QRY) Alexandria (ALS) – Big Oaks	362 kV	0.05	0.12	0.24	0.44	1.66	4.39	3.49	3.59	1.64	0.46	0.08	0.08	0.04
345 kV/345 kV Double-Circuit Monopole	Quarry (QRY) – Monticello (MNN) Alexandria (ALS) – Big Oaks	362 kV	0.04	0.07	0.14	0.54	1.83	3.82	3.15	3.82	1.82	0.54	0.21	0.11	0.05
345 kV Single-Circuit Monopole	Alexandria (ALS) – Big Oaks	362 kV	0.05	0.14	0.59	0.90	1.22	1.23	2.76	3.61	1.83	0.82	0.43	0.08	0.03
345 kV Single-Circuit H-Frame River Crossing	Alexandria (ALS) – Big Oaks	362 kV	0.07	0.20	1.11	1.76	2.30	1.74	0.82	1.82	2.08	1.51	0.95	0.18	0.06

Figure 6.3-1 Calculated Electric Fields (kV/m) for Proposed 345 Kilovolt Transmission Line Designs




Calculated Electric Fields at Nominal System Voltage (345kV)
Double Circuit 345kV (QRY-MNN) / 345kV (ALS-BO) Both On
Electric Field Levels (kV/m)
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
-300
-250
-200
-150
-100
-75
-50
-25
-10
0
10
25
50
75
100
150
200
250
300
Distance from Centerline (ft)


Calculated Electric Fields at Nominal System Voltage (345kV)
Single Circuit 345kV (ALS-BO)
Electric Field Levels (kV/m)
4
3.5
3
2.5
2
1.5
1
0.5
0
-300
-250
-200
-150
-100
-75
-50
-25
-10
0
10
25
50
75
100
150
200
250
300
Distance from Centerline (ft)



6.3.2.3 Magnetic Fields

The projected magnetic fields for different structure and conductor configurations for the Project are provided in Figure 6.3-2 and Table 6.3-3. Because magnetic fields are dependent on the current flowing on the line, magnetic fields were calculated for two different estimated typical system conditions during the Project's first year in service (2026). These two scenarios are: (1) System Peak Energy Demand and (2) System Average Energy Demand. The "System Peak Energy Demand" current flow (estimated loading of 580 MVA) represents the current flow on the line during the peak hour of system-wide energy demand. The "System Average Energy Demand" current flow (estimated loading of 185 MVA) represents the current flow on the line during a non-peak time of the year.

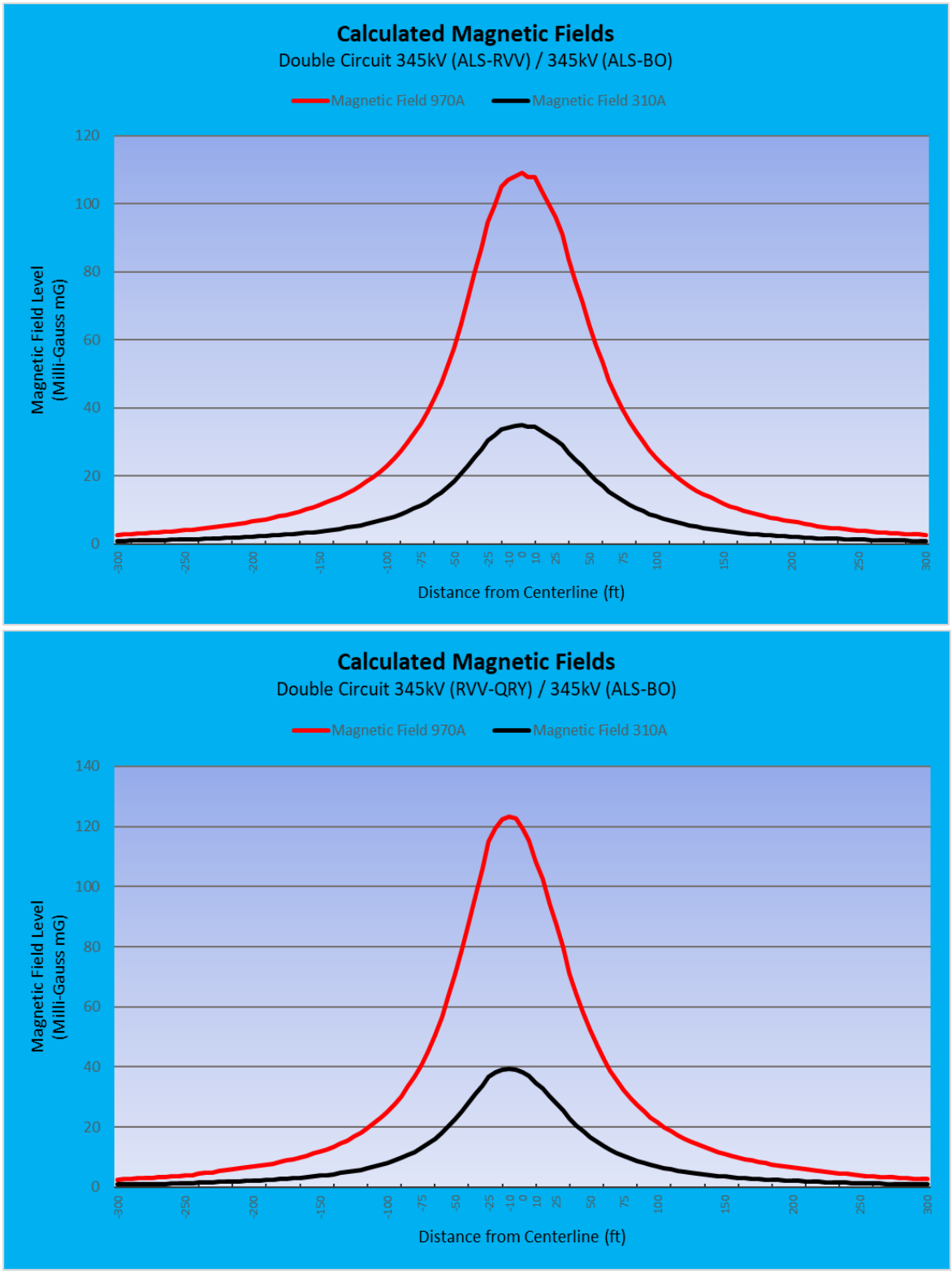
The magnetic field values for the two scenarios were calculated at a point where the conductor is closest to the ground. The magnetic field data shows that magnetic field levels decrease rapidly as the distance from the centerline increases (proportional to the inverse square of the distance from source). In addition, since the magnetic field

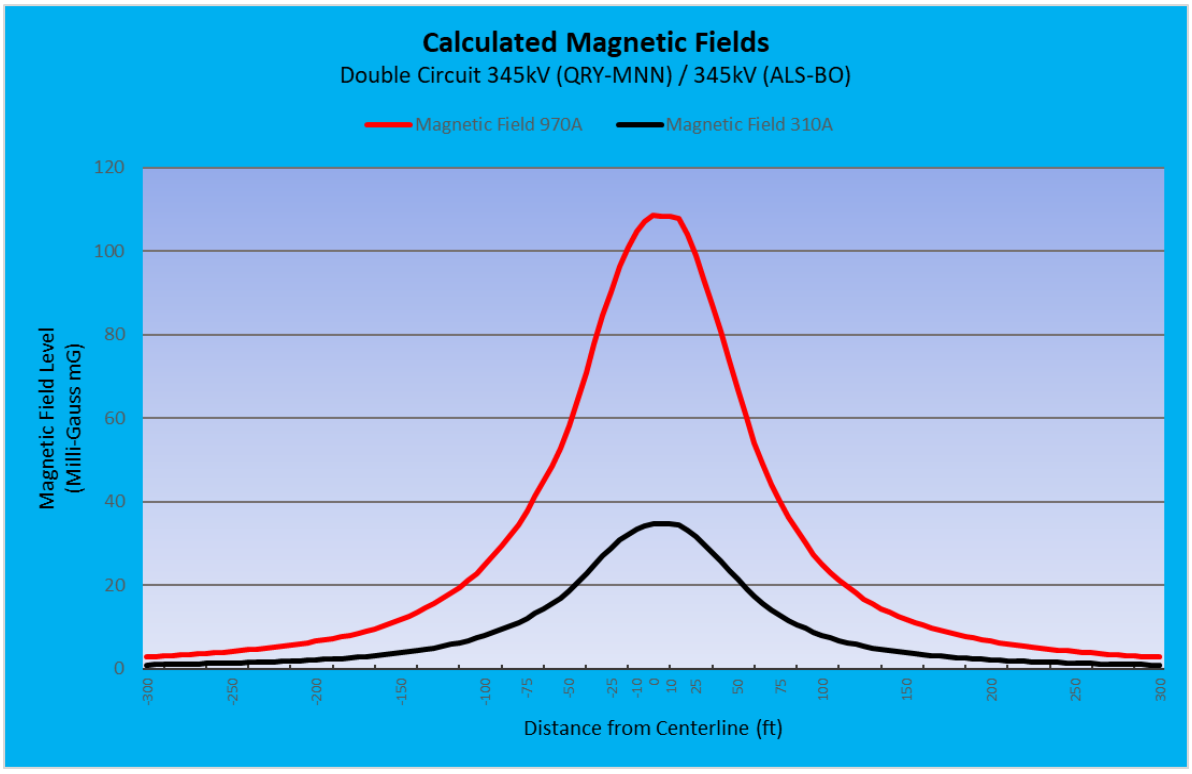
produced by the transmission lines is dependent on the current flow, the actual magnetic fields when the Project is placed in service will vary as the current flow on the line changes throughout the day. Magnetic field calculations for the Project substations are not provided here because the specific physical design of a substation is required to calculate representative magnetic fields, and that level of design is not yet available for the Project substations. Magnetic fields associated with the Project's substations are anticipated to be similar to other existing 345 kV substations in Minnesota.

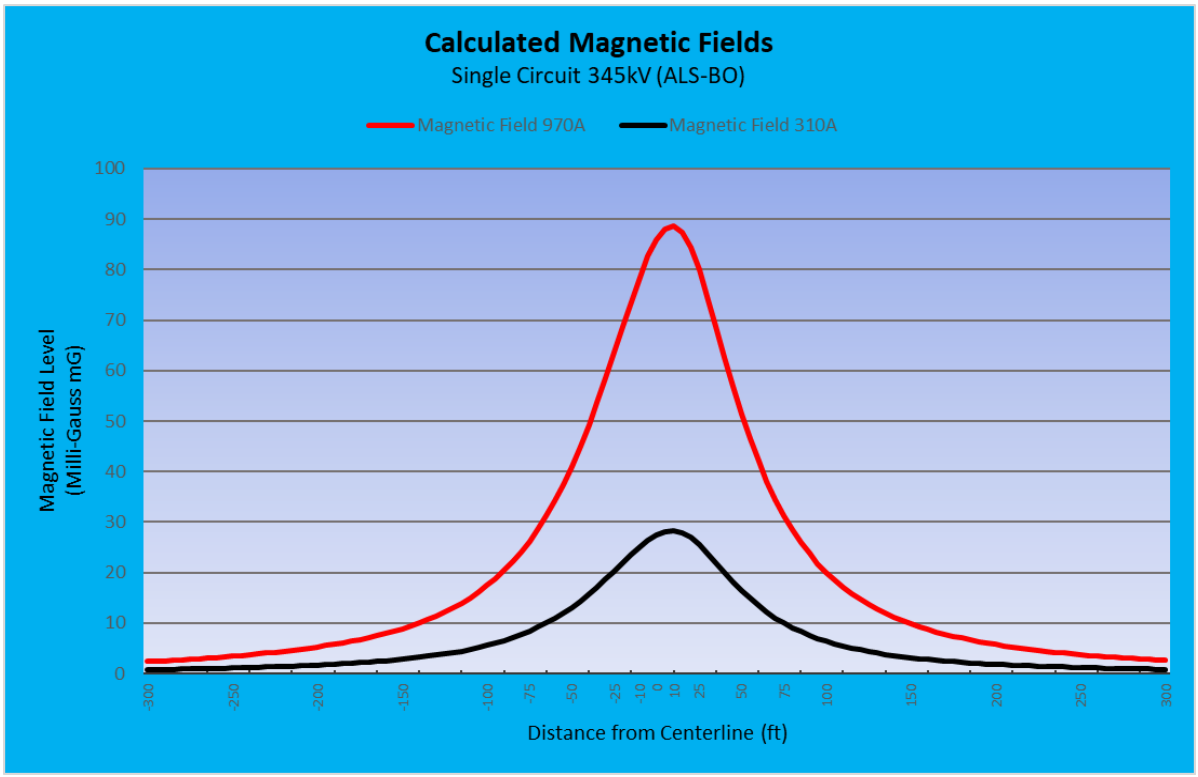
Table 6.3-3 Magnetic Field Calculation Summary (mG)

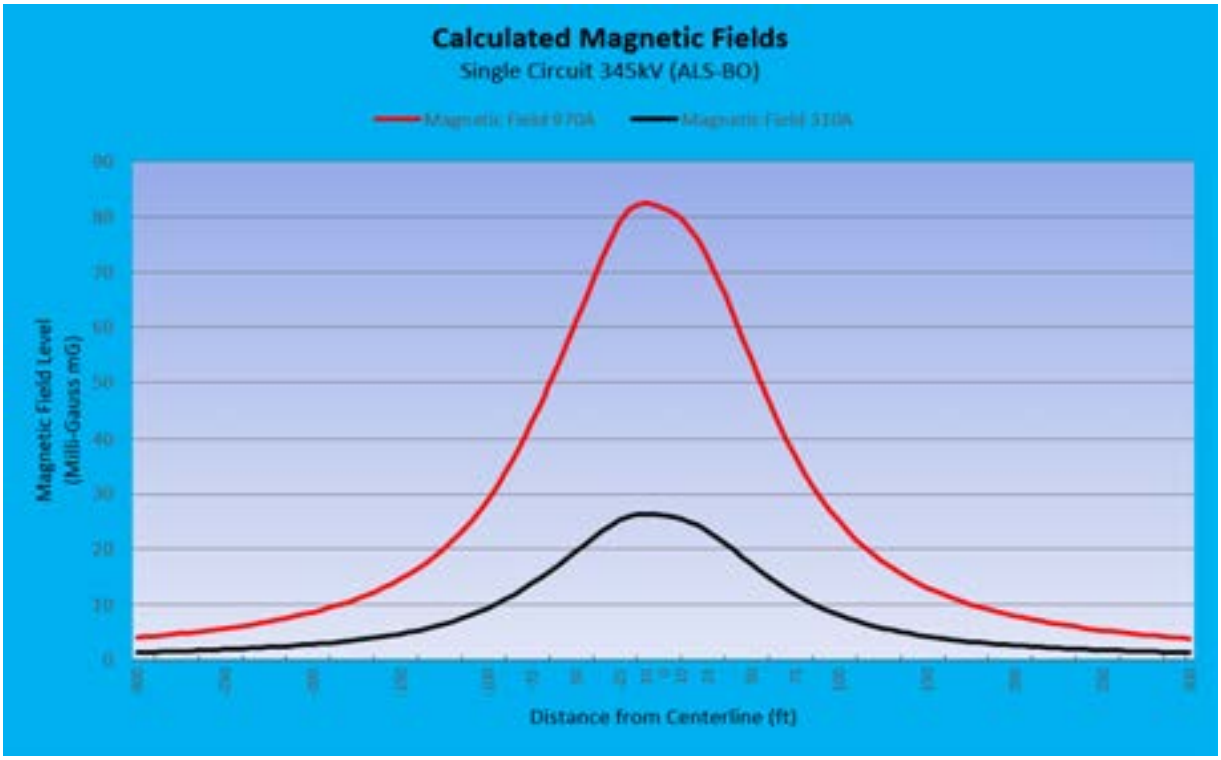
Structure Type	Circuits Present	System Condition	Current (Amps)	Distance to Proposed Alignment (feet)												
				-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
345 kV/345 kV Double-Circuit Monopole	Alexandria (ALS) – Riverview (RVV) Alexandria (ALS) – Big Oaks	Peak System Energy Demand (580MVA/580MVA)	970/970	2.7	6.6	23	35	58	95	109	96	65	40	25	6.6	2.6
	Alexandria (ALS) – Riverview (RVV) Alexandria (ALS) – Big Oaks	Average System Energy Demand (185 MVA/185 MVA)	310/310	0.9	2.1	7.3	11	18	30	35	31	21	13	8.1	2.1	0.8
345 kV/345 kV Double-Circuit Monopole	Riverview (RVV) – Quarry (QRY) Alexandria (ALS) – Big Oaks	Peak System Energy Demand (580MVA/580MVA)	970/970	2.6	6.7	25	40	71	115	119	87	52	32	21	6.5	2.6
	Riverview (RVV) – Quarry (QRY) Alexandria (ALS) – Big Oaks	Average System Energy Demand (185 MVA/185 MVA)	310/310	0.8	2.2	8.0	13	23	37	38	28	17	10	6.9	2.1	0.8
345 kV/345 kV Double-Circuit Monopole	Quarry (QRY) – Monticello (MNN) Alexandria (ALS) – Big Oaks	Peak System Energy Demand (580MVA/580MVA)	970/970	2.8	6.5	25	38	58	90	109	99	67	40	25	6.6	2.7
	Quarry (QRY) – Monticello (MNN) Alexandria (ALS) – Big Oaks	Average System Energy Demand (185 MVA/185 MVA)	310/310	0.9	2.1	7.9	12	19	29	35	32	21	13	8.0	2.1	0.9
345 kV Single-Circuit Monopole	Alexandria (ALS) – Big Oaks	Peak System Energy Demand (580MVA)	970	2.4	5.3	17	26	41	64	86	80	51	31	20	5.8	2.6
	Alexandria (ALS) – Big Oaks	Average System Energy Demand (185 MVA)	310	0.8	1.7	5.6	8.4	13	20	27	26	16	10	6.4	1.8	0.8
345 kV Single-Circuit H-Frame River Crossing	Alexandria (ALS) – Big Oaks	Peak System Energy Demand (580MVA)	970	3.9	8.5	29	43	61	79	82	73	54	37	25	7.9	3.8
	Alexandria (ALS) – Big Oaks	Average System Energy Demand (185 MVA)	310	1.3	2.7	9.2	14	19	25	26	23	17	12	8.0	2.5	1.2

Figure 6.3-2 Calculated Magnetic Flux density (mG) for Proposed 345/345 Kilovolt Transmission Line Design




Calculated Magnetic Fields
Double Circuit 345kV (QRY-MNN) / 345kV (ALS-BO)
Magnetic Field 970A
Magnetic Field 310A
Magnetic Field Level (Milli-Gauss mG)
120
100
80
60
40
20
0
-300
-250
-200
-150
-100
-75
-50
-25
-10
0
10
25
50
75
100
150
200
250
300
Distance from Centerline (ft)


Calculated Magnetic Fields
Single Circuit 345kV (ALS-BO)
Magnetic Field 970A
Magnetic Field 310A
Magnetic Field Level (Milli-Gauss mG)
100
90
80
70
60
50
40
30
20
10
0
-300
-250
-200
-150
-100
-75
-50
-25
-10
0
10
25
50
75
100
150
200
250
300
Distance from Centerline (ft)



There are presently no Minnesota regulations pertaining to magnetic field exposure. The Applicants provide information to the public, interested customers, and employees so they can make informed decisions about magnetic fields. Such information includes the availability for measurements to be conducted for customers and employees upon request.

Considerable research has been conducted since the 1970s to determine whether exposure to power-frequency (60 hertz) magnetic fields causes biological responses and health effects. Public health professionals have also investigated the possible impact of exposure to EMF on human health for the past several decades. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or health effects continues to be debated.

A large body of research has been reviewed by many leading public health agencies such as the U.S. National Cancer Institute, the U.S. National Institute of Environmental Health Sciences, and the World Health Organization (WHO), among others. These reviews do not show that exposure to electric power EMF causes or contributes to adverse health effects.

Wisconsin, Minnesota, and California have all conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group (Working Group) to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from HVTL EMF effects. The Working Group consisted of staff from various state agencies and published its findings in a White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options in September 2002 (reference (4)).

The Commission, based on the Working Group and WHO findings, has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects" (reference (5)).

6.3.2.4 Stray Voltage and Induced Voltage

"Stray voltage" is a condition that can potentially occur on a property or on the electric service entrances to structures from distribution lines connected to these structures—not transmission lines as proposed here. The term generally describes a voltage between two objects where no voltage difference should exist. More precisely, stray voltage is a voltage that exists between the neutral wire of either the service entrance or of premise wiring and grounded objects in buildings such as barns and milking parlors. The source of stray voltage is a voltage that is developed on the grounded neutral wiring network of a building and/or the electric power distribution system.

Transmission lines do not, by themselves, create stray voltage because they do not connect directly to businesses or residences. Transmission lines, however, can induce voltage on a distribution circuit that is parallel and immediately under the transmission line. If the proposed transmission lines parallel or cross distribution lines, appropriate mitigation measures can be taken to address any induced voltages. For additional information regarding stray voltage, please see the Minnesota Stray Voltage Guide that is available online at www.minnesotastrayvoltageguide.com or contact your electric utility provider.

6.3.2.5 Farming Operations, Vehicle Use, and Metal Buildings near Power Lines

The power lines will be designed to meet or exceed minimum clearance requirements for electric fencing as specified by the NESC. Nonetheless, insulated electric fences used in livestock operations can be instantly charged with an induced voltage from transmission lines. The induced charge may continuously drain to ground when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. The local electrical utility can provide site specific information about how to prevent possible shocks when the charger is disconnected.

Farm equipment, passenger vehicles, and trucks may be safely used under and near power lines. The power lines will be designed to meet or exceed minimum clearance requirements with respect to roads, driveways, cultivated fields, and grazing lands as specified by the NESC. Recommended clearances within the NESC are designed to accommodate a relative vehicle height of 14 feet.

Vehicles or any conductive body under HVTLs will be immediately charged with an electric charge. Without a continuous grounding path, this charge can provide a nuisance shock. Such nuisance shocks are a rare event because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, the induced charge on vehicles will normally be continually flowing to ground unless they have unusually old tires or are parked on dry rock, plastic, or other surfaces that insulate them from the ground. The Applicants can provide additional vehicle-specific methods for reducing the risk of nuisance shocks in vehicles.

Buildings are permitted near transmission lines but are generally discouraged within the right-of-way itself because a structure under a line may interfere with the safe operation of the transmission facilities. For example, a fire in a building within the right-of-way could damage a transmission line. The NESC establishes minimum electrical clearance zones from power lines for the safety of the general public and utilities often acquire easement rights that require clear areas in excess of these established zones. Utilities may permit encroachment into that easement for buildings

and other activities when they can be deemed safe and still meet the NESC minimum requirements. Metal buildings may have unique issues due to induction concerns. For example, conductive buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure can contact the Applicants for further information about proper grounding requirements.

6.3.2.6 Impacts and Mitigation

With the proper safeguards and protective measures described above, impacts related to public health and safety are not anticipated. Therefore, no additional mitigative measures are proposed.

6.3.3 Audible Noise

Noise is defined as unwanted sound. Noise may include a variety of sounds of different intensities across the entire frequency spectrum. Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of three dBA is barely perceptible to average human hearing. A five dBA change in noise level, however, is clearly noticeable. A ten dBA change in noise levels is perceived as a doubling or halving of noise loudness, while a 20 dBA change is considered a dramatic change in loudness (reference (6)).

For cumulative increases resulting from sources of different magnitudes, the rule of thumb is that if there is a difference of greater than ten dBA between noise sources, there will be no additive effect (i.e., only the louder source will be heard and the quieter source will not contribute to noise levels). Therefore, predicted noise levels associated with the transmission line are typically much lower than the ambient noise and will not increase the existing background noise levels. Section 6.3.3.3 addressed noise related to operation of the proposed Big Oaks Substation. Table 6.3-4 provides noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here in context.

Table 6.3-4 Noise Levels Associated with Common Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet engine (at 25 meters)
130	Jet aircraft (at 100 meters)
120	Concert
110	Pneumatic chipper (powered by compressed air or hydraulics)
100	Jointer/planer
90	Chainsaw
80	Heavy truck traffic
70	Business office
60	Conversational speech
50	Library
40	Bedroom
30	Secluded woods
20	Whisper

Source: reference (6)

6.3.3.1 Noise Related to Construction

Construction activities will generate noise that is short-term and intermittent. Construction activities will be limited to daytime hours. As such, the Project will have temporary and localized noise impacts during construction, but overall will not have significant noise effects for the surrounding area. Residents living in close proximity identified in Section 6.3.1 would be temporarily affected by noise generated from construction activities. Construction activities are estimated to last 18 to 20 months however noise would dissipate at a single location as construction crews progress along the Project Route.

6.3.3.2 Noise Related to Transmission Line

Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal.

Transmission conductors can produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Noise emission from a transmission line occurs during certain weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound due to the small

amount of electricity ionizing the moist air near the wires. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise equal to approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible by humans.

The MPCA has established standards for the regulation of noise levels. The land use activities associated with residential, commercial and industrial land have been grouped together into Noise Area Classifications (NACs). See Minn. R. 7030.0050. Each NAC is then assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits for land use activities within the NAC. See Minn. R. 7030.0040. Table 6.3-5 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a one-hour period; L50 is the dBA that may be exceeded 50 percent (30 minutes) of the time within an hour, while L10 is the dBA that may be exceeded 10 percent (six minutes) of the time within an hour. Residences, which are typically considered sensitive to noise, are classified as NAC-1.

Table 6.3-5 Minnesota Pollution Control Agency Noise Limits by Noise Area Classification (dBA)

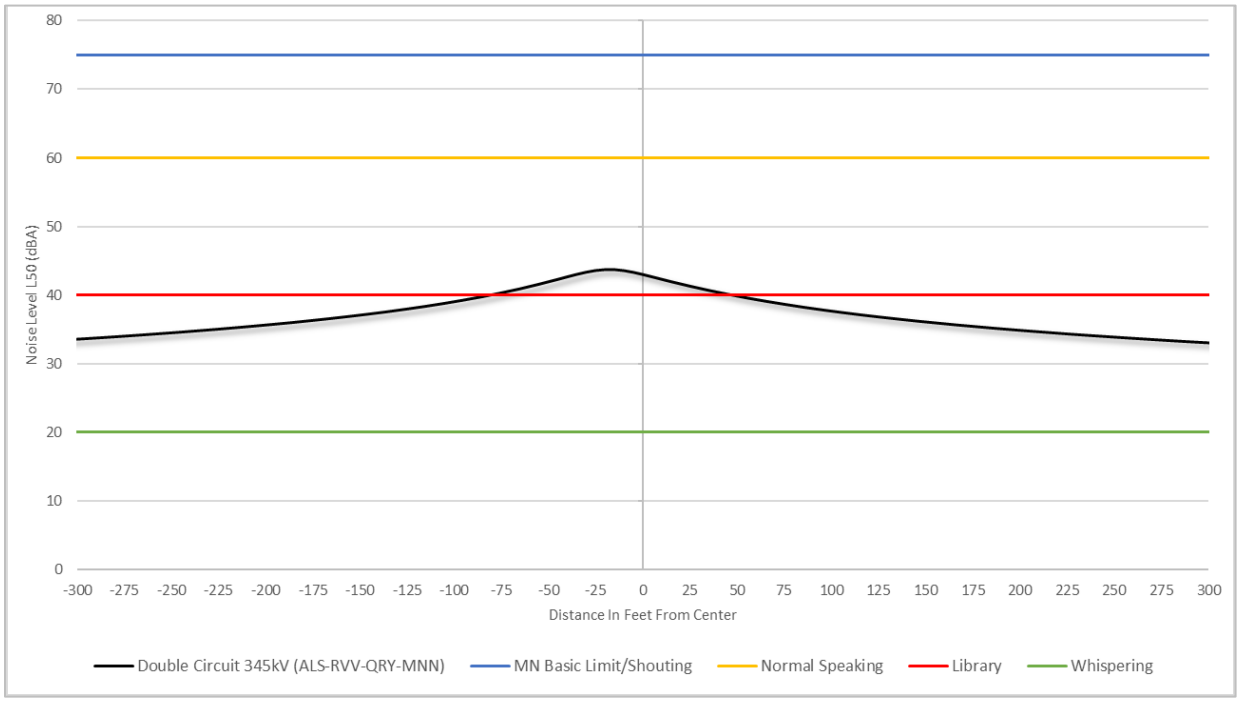
Noise Area Classification (NAC)	Land Use Activities	Daytime		Nighttime	
		L_{50}	L_{10}	L_{50}	L_{10}
1	residential housing, religious activities, camping and picnicking areas, health services, hotels, educational services	60	65	50	55
2	retail, business and government services, recreational activities, transit passenger terminals.	65	70	65	70
3	highways, utilities, manufacturing, fairgrounds and amusement parks, agricultural and forestry activities.	75	80	75	80

The Applicants performed a noise analysis by assuming that the noise levels generated by the Project will be the same at night as those generated during the daytime; using this assumption, compliance with the nighttime levels (more restrictive) will also demonstrate compliance with the daytime noise standards due to greater noise sensitivity of humans at night.

The Applicants anticipate that NAC-1 is likely to apply to the large majority of the Project. NAC-1 has a daytime L50 limit of 60 dBA and a nighttime L50 limit of 50 dBA. As shown in Figure 6.3-3 and Figure 6.3-4 the proposed 345 kV lines will be below the MPCA noise limits for NAC-1 which are the most stringent MPCA noise limits.

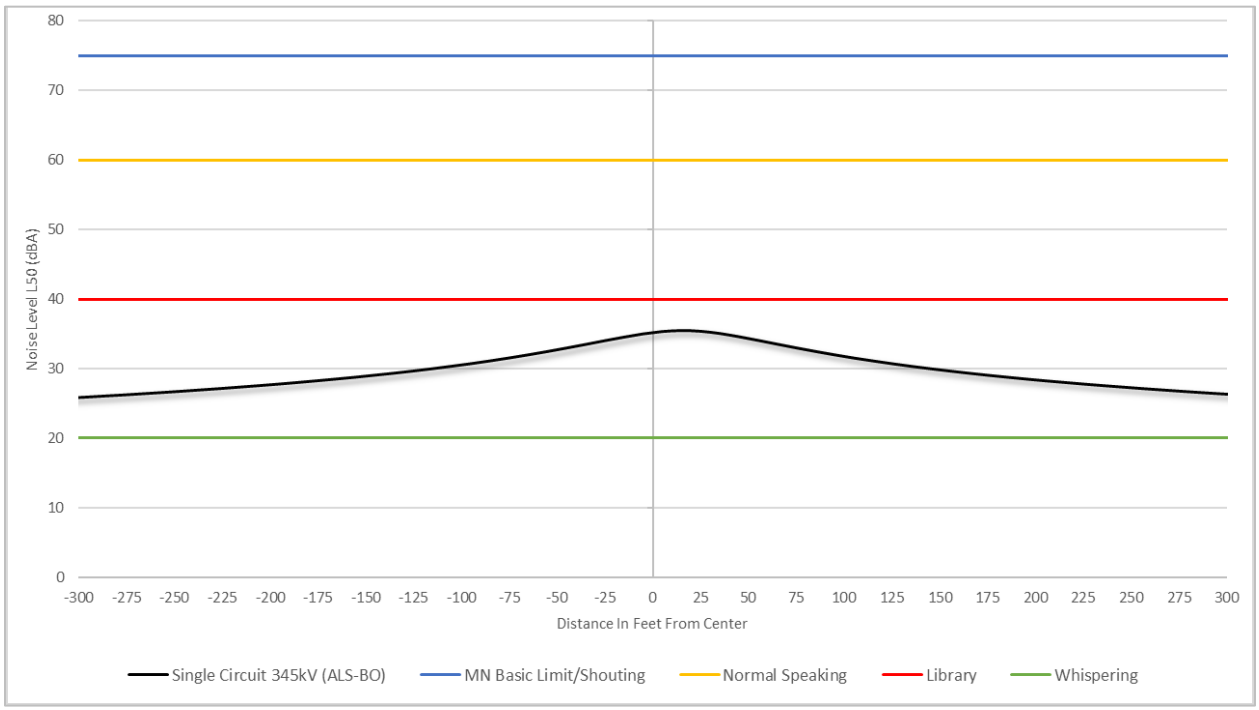
As discussed in Section 6.3.2.1, there are 154 residences within 500 feet of the anticipated centerline of the proposed transmission line right-of-way. The nearest residence is approximately 75 feet from the existing transmission line centerline along Interstate 94 in Saint Cloud, Minnesota. This segment of the Project would be classified under the NAC 1 category. Noise generated by a double-circuit 345 kV transmission line would not exceed 45 dBA from the center of the transmission line. Therefore, it is not anticipated that the Project would exceed the MPCA noise standards as previously defined.

Figure 6.3-3 Calculated Audible Noise at Nominal System Voltage



(345 kV Double-Circuit)

Figure 6.3-4 Calculated Audible Noise at Nominal System Voltage



(345 kV Single-Circuit)

6.3.3.3 Noise Related to Substations

Substations may also contribute noise. Transformer or shunt reactor "hum" is the dominant noise source at substations if such equipment exists. At substations without transformers or shunt reactors, only infrequent noise sources would exist such as the opening and closing of circuit breakers, the operation of an emergency generator, or unexpected maintenance issues. Typical substation design is such that noise produced by these sources does not reach beyond the substation property, in the rare cases that space is limited such that it cannot be accomplished, noise reduction designs are applied such as sound walls placed around transformers, or shelter belts planted around substations to reduce the distance the sound can travel. Like the transmission lines themselves, the Project substations will comply with the MPCA noise standards as set forth in Minn. R. 7030.0040.

6.3.3.4 Impacts and Mitigation

Noise associated with the operation of the Project is not predicted to exceed the limits for the NAC area identified in Table 6.3-5. The noise modeling indicates that the noise generated by the Project will not exceed the most stringent MPCA noise standards of NAC-1. Therefore, no mitigative measures are proposed.

6.3.4 Aesthetics

The aesthetic and visual resources of a landscape are defined as the existing natural and built features visible to the public which affect the visual quality and character of an area. This section discusses the existing aesthetic and visual resources visible from areas where the Project is likely to be within view, referred to as the "viewshed". A project's viewshed will vary based on location. Projects located in open and agricultural areas would have a more expansive viewshed, as they are free of visual obstructions. Conversely, projects in urban and residential areas may have a smaller viewshed, due to the presence of visual obstructions from buildings, trees, and existing infrastructure.

To gauge how the aesthetics of the landscape could be affected by the Project, it is valuable to first assess the character of the existing landscape. A landscape's character is largely influenced by topography, vegetation, and water resources.

The topography of the Project Study Area is generally flat, with areas of rolling plains. As discussed in Section 6.2, the current landscape across the Proposed Route is dominated by agricultural land. In the vicinity of the major rivers crossed by the Project, topography becomes more rolling, with some areas of high hills and broad slopes. In these riparian zones, there is more topography and higher vegetative cover, including forested areas.

The agricultural landscape is dotted with various structures including residences and farm buildings (inhabited and uninhabited farmsteads) scattered along rural county roads. These structures become focal points in the agricultural landscape along the Proposed Route.

The visual character of a landscape is also largely influenced by the presence of the built environment, such as residential, commercial, and municipal buildings, transportation infrastructure, and industrial features. The built environment of the Project Study Area is generally open; however, around cities in the vicinity of the Project the landscape becomes urban, consisting of residential, commercial, and industrial infrastructure in the vicinity of the Proposed Route.

Additionally, the majority of the Proposed Route consists of existing infrastructure, which visually altered the landscape upon its construction.

6.3.4.1 Existing Transmission Line Second Circuit

Because this portion of the Project consists largely of stringing a second circuit onto existing infrastructure, aesthetic changes related to this portion of the Proposed Route will be minimal. Visual alterations to the landscape by the construction of a new transmission line occurred when the existing infrastructure was installed. Stringing a new line onto existing infrastructure will result in a very minimal change to the landscape.

6.3.4.2 Alexandria Substation Tap

The Alexandria Substation Tap represents a deviation from the existing infrastructure for approximately 0.2 miles, where new transmission line would be installed north of existing infrastructure to connect to the Alexandria Substation. The substation's current fenced area would also be expanded to accommodate new substation equipment. The landscape surrounding the Proposed Route in this area is generally industrial and adjacent to Interstate-94. In this setting, the Alexandria Substation Tap and expansion represents a minimal visual disruption that is not anticipated to impact the existing viewshed.

6.3.4.3 Riverview Substation Bypass

The Riverview Substation Bypass represents a deviation from the existing infrastructure for approximately 0.5 miles, where the new circuit will connect to the Riverview Substation and the existing circuit will be reconfigured to bypass the Riverview Substation; the bypass would be installed west and south of the existing infrastructure around the existing Riverview Substation. The landscape surrounding the Proposed Route in this area is generally rural, with the exception of the existing Riverview Substation. Visual disruptions in this predominantly rural landscape are mitigated by siting the proposed alignment along existing roadway corridors. Additionally, the Proposed Route's proximity to the existing Riverview Substation, which is already a visual disruption to the generally rural nature of this area, minimizes the impact that might be caused by construction of the Riverview Substation Bypass.

6.3.4.4 Quarry Substation Bypass

The Quarry Substation Bypass represents a deviation from the existing infrastructure for approximately 0.2 miles, where new transmission line would be installed east of the existing infrastructure for the Project to bypass the existing Quarry Substation. The landscape surrounding the Proposed Route in this area is generally rural, except

for the existing Riverview Substation. The proposed alignment would result in the clearing of an existing tree line, thereby altering the landscape in this area from one that is forested and partially shields views of the Quarry Substation to a landscape that is more open and industrial. However, the presence of the Quarry Substation already represents a visual disruption to the rural setting, and further changes to the landscape in this area will not result in a large change to the viewshed.

6.3.4.5 Big Oaks Substation

The Big Oaks Substation would consist of a new, 10-acre substation constructed within the Big Oaks Substation Siting Area. The landscape surrounding the Big Oaks Substation Siting Area is generally agricultural but is also located adjacent to a landfill facility to the east and a power plant to the north. Any visual disruption caused by construction of a new substation in a predominantly rural landscape is minimized by the presence of the existing landfill facility and the power plant. However, for any residences within the viewshed of the new Big Oaks Substation, the impact would be more significant.

6.3.4.6 Mississippi River Crossing Options

A new crossing over the Mississippi River will be constructed to connect the Proposed Route to the new Big Oaks Substation. Each of the two options being considered represents a new crossing over the river. The Western Crossing Option is approximately 0.7 miles long and cross a portion of the river that is sparsely wooded but undeveloped. The Eastern Crossing Option is approximately 2.1 miles long and would cross the river adjacent and parallel to an existing 115 kV transmission line.

The Western Crossing Option would cause the most visual disruption to the existing landscape as this Route would consist of new transmission line construction in an otherwise undisturbed river setting. The Eastern Crossing Option minimizes impacts by constructing the new transmission line adjacent to existing transmission line infrastructure.

6.3.4.7 Impacts and Mitigation

Because the majority of the Proposed Route consists of stringing a new circuit along an existing transmission corridor, aesthetic impacts are anticipated to be minimal. Potential impacts to aesthetics along the Proposed Route will occur in areas where new structures are proposed, where the Proposed Route will deviate from the existing

infrastructure, and in the area where a new substation will be constructed. Where new structures are proposed, mitigation would include routing to avoid removal of trees and vegetation and routing to follow existing infrastructure corridors to the extent possible. The Big Oaks Substation will be sited near existing facilities such as the existing landfill facility and the power plant to the extent possible, in order to minimize intrusions to the rural landscape. In addition, existing vegetation and topography provide natural screening such that the Big Oaks Substation will not be visible from the Mississippi River (i.e., recreational users of the Mississippi River water trail would not be able to see the Big Oaks Substation from the river).

6.3.5 Socioeconomics

The area of study for the socioeconomic analysis includes Douglas, Sherburne, Stearns, Todd, and Wright Counties in Minnesota. Socioeconomic factors analyzed include population, income, poverty, and employment. U.S. Census data was obtained from the 2020 census at the community and township level to characterize the area along the Proposed Route. These datasets were compared to county and state data, as demonstrated in Table 6.3-6.

Table 6.3-6 Demographics U.S. Census Bureau 2020 Data

Location	Total Population	White (%)	Black or African American (%)	American Indian (%)	Asian (%)	Native Hawaiian (%)	Some Other Race Alone (%)	Two or More Races
Minnesota	5,706,494	4,423,146 (78%)	398,434 (7%)	68,641 (1%)	299,190 (5%)	2,918 (<1%)	168,444 (3%)	345,721 (6%)
Douglas County	39,006	36,887 (95%)	235 (1%)	129 (<1%)	228 (1%)	11 (<1%)	285 (1%)	1,231 (3%)
Sherburne County	97,183	85,504 (88%)	3,666 (4%)	444 (<1%)	1,295 (1%)	22 (<1%)	1,189 (<1%)	5,063 (5%)
Stearns County	158,292	130,858 (83%)	13,315 (8%)	628 (<1%)	3,188 (2%)	69 (<1%)	3,546 (<1%)	495 (<1%)
Todd County	24,109	22,681 (90%)	145 (1%)	162 (1%)	160 (1%)	7 (<1%)	488 (2%)	1,153 (2%)
Wright County	141,337	127,090 (90%)	2,637 (2%)	446 (<1%)	1,898 (1%)	4 (<1%)	77 (<1%)	7,013 (5%)
Route[1]	41,899	36,859 (88%)	2,358 (6%)	172 (<1%)	420 (1%)	9(<1%)	722 (3%)	1359 (3%)

Source: reference (7)
Notes: Persons may opt to identify with more than one racial minority, therefore, the sum of all racial categories in the table may not equal 100%.
[1] Route population estimates include averages of all townships crossed by the Route. This includes the following townships: Alexandria, Hudson, La Grand, Lake Mary, Orange, Becker, Ashley, Collegeville, Farming, Grove, Lynden, Melrose, Munson, Oak, Clearwater, Monticello, Sauk Center, West Union, Silver Creek, and Waite Park

Stearns County is the most populated county within the Proposed Route. The population of Stearns County is concentrated in the St. Cloud area, which is in the eastern half of the Proposed Route. Development in St. Cloud is expanding southeast towards the Twin Cities, while the Twin Cities are expanding northwest. Considerable growth is expected in the three counties between these two metropolitan areas, in part because the area is within commuting distance of St. Cloud and the Twin Cities along I-94.

According to the U.S. Census Bureau, the majority of the population in the Proposed Route identify as white, as shown in Table 6.3-6. The Proposed Route has a lower percentage of minority populations than the state average.

Table 6.3-7 shows the 2021 per capita income and the percentage of the population below the poverty level for the state in the counties crossed by the Proposed Route

that are identified in Table 6.3-8. The counties crossed by the Proposed Route had a lower per capita income than the statewide average. The poverty level rate of counties within the Proposed Route ranged from 3.2 percent to 13.7 percent. In 2021 the state poverty rate was 5.5 percent. The per capita income for the counties crossed by the Proposed Route is all lower than the Minnesota average per capita income. The statewide average income is skewed by higher average incomes around the Twin Cities metro area compared to rural areas of the state.

Table 6.3-7 Economic Characteristics 2021 1-Year Estimates

Location	Per Capita Income	Percentage of Individuals Below Poverty Level	Top Employment by Industry[1]
Minnesota	$41,753	5.5	E, P, M
Douglas County	$36,559	8.1	E, M, R
Sherburne County	$40,462	4.8	E, M, R
Stearns County	$33,247	7.4	E, M, R
Todd County	$26,427	13.7	E, M, R
Wright County	$39,900	3.2	E, M, C

Notes:
Classification System and abbreviated as follows: Ag = Agriculture, Forestry, Fishing, and Hunting, and Mining; C = Construction; E = Educational, Health and Social Services; M = Manufacturing; P= Professional, Scientific, and Management, and Administrative and Waste Management Services; and R = Retail Trade.
Source: reference (8)
[1] U.S. Census Bureau, 2021. Industries are defined under the 2012 North American Industry

The largest employment industry in the Proposed Route is the educational, health and social services industry. The second largest industry in terms of employment is manufacturing; retail trade is the third largest sector of employment. The professional scientific and management industry category is the second largest industry in the state of Minnesota; however, it is not a significant labor industry along the Proposed Route (Table 6.3-7).

Temporary housing, consisting of apartment rentals, hotels, motels, and campgrounds, is abundant in the St. Cloud area. Proximity to the Twin Cities metro area, which is approximately 70 miles from St. Cloud, provides a relatively large supply of vacant temporary housing.

6.3.5.1 Impacts and Mitigation

The construction and operation of the Project is expected to have minimal influence on the local (county and municipal) economies. In terms of payroll earnings and construction expenditures, the economic benefit from the Project will be small relative to the regional economy of St. Cloud, which is the major center of economic activity for the Project Study Area.

Construction duration for this Project will be approximately 18 to 20 months and will employ approximately 100 to 150 construction workers. Multiple construction crews are anticipated. During construction, there will be a minor positive impact on the local economy due to the expenditures of the construction crews. Long-term beneficial impacts from the Project will include incremental increases in revenues from utility property taxes.

No adverse socioeconomic impacts are anticipated, and therefore, no mitigative measures are proposed.

6.3.6 Environmental Justice

The U.S. Environmental Protection Agency (EPA) defines environmental justice as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in developing, implementing, and enforcing environmental laws, regulations, and policies (reference (9)). The MPCA has developed an environmental justice mapping tool to identify environmental justice communities within the state of Minnesota (reference (10)). This analysis identifies environmental justice communities located near the Project to determine if the Project would disproportionately affect environmental justice communities.

The Applicants used the MPCA mapping tool and US Census Bureau data to identify environmental justice communities located near the Project. The MPCA mapping tool considers tribal areas and census tracts with higher concentrations of low-income and minority populations as areas of increased concern for environmental justice. The MPCA defines low-income populations as populations with at least 40 percent of people reporting income less than 185 percent of the federal poverty level. Minority communities are identified as communities with 50 percent or more people of color.

According to the MPCA environmental justice mapping tool, the Proposed Route intersects six census tracts identified as low-income communities (Map 9). Two of

these census tracts are also identified as containing more than 50 percent people of color (Map 10). The Proposed Route does not cross any federally recognized tribal areas.

The Minnesota State Legislature revised the definition of an "environmental justice area" in Minn. Stat. § 216B.1691, subd. 1(e). Although this statute is not directly applicable to the Project, the definition provides a different method for assessing environmental justice areas along the Proposed Route. The statute defines an environmental justice area as an area in Minnesota that, based on the most recent data published by the U. S. Census Bureau, meets one or more of the following criteria:

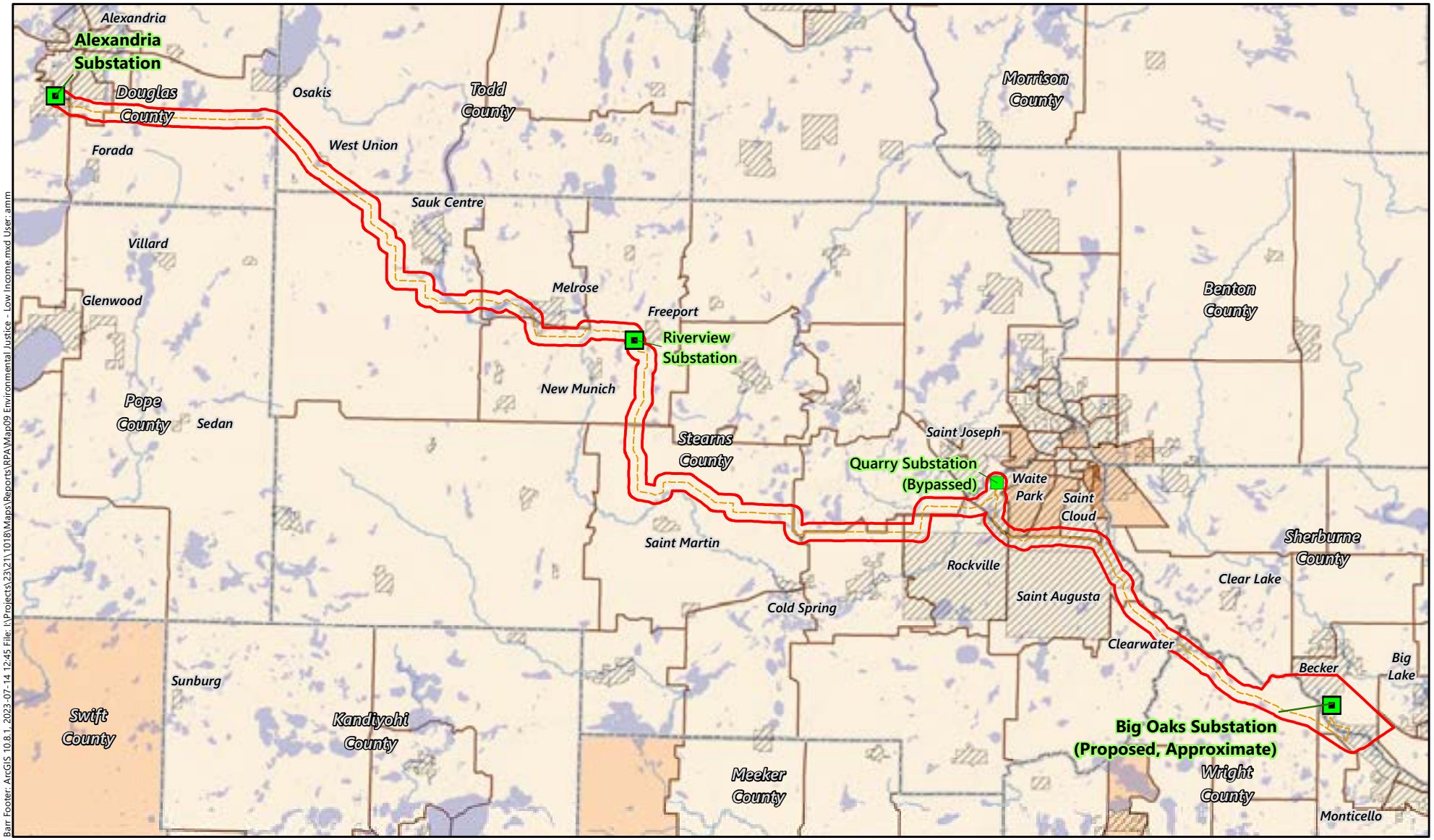
- 40 percent or more of the areas total population is non-white;
- 35 percent or more of the households in the area have an income that is at or below 200 percent of the federal poverty level;
- 40 percent or more of the area's residents over the age of five have limited English proficiency; or
- The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

This revised definition was enacted on February 7, 2023. These changes are not yet reflected in the MPCA environmental justice mapping tool. The Applicants reviewed census data to identify environmental justice communities based on the revised definition. The Proposed Route crosses through 24 census tracts (Table 6.3-8). According to the revised environmental justice definition the Proposed Route intersects six environmental justice areas (Table 6.3-8).

Table 6.3-8 Environmental Justice Data for Census Tracts Based on Minnesota Laws 2023, Chapter 7, Section 3.

Location	County	40% or more of total population is non-white[1]	At least 35% of people reported income less than 200% of the federal poverty level[2]	40% or more people with limited English proficiency[3]	Area located within Indian Country?[4]	Does the location qualify as an environmental justice community?
Census Tract 304.07	Sherburn	No	No	No	No	No
Census Tract 304.10	Sherburn	No	No	No	No	No
Census Tract 303.02	Sherburn	No	No	No	No	No
Census Tract 1002.02	Wright	No	No	No	No	No
Census Tract 1002.03	Wright	No	No	No	No	No
Census Tract 4507.04	Douglas	No	**Yes**	No	No	**Yes**
Census Tract 4507.03	Douglas	No	No	No	No	No
Census Tract 105	Stearns	No	No	No	No	No
Census Tract 115	Stearns	No	**Yes**	No	No	**Yes**
Census Tract 106	Stearns	No	No	No	No	No
Census Tract 113.02	Stearns	No	No	No	No	No
Census Tract 114	Stearns	No	No	No	No	No
Census Tract 111.02	Stearns	No	No	No	No	No
Census Tract 5.02	Stearns	**Yes**	**Yes**	No	No	**Yes**
Census Tract 112.02	Stearns	No	No	No	No	No
Census Tract 113.06	Stearns	No	No	No	No	No
Census Tract 113.05	Stearns	No	No	No	No	No
Census Tract 113.08	Stearns	No	**Yes**	No	No	**Yes**
Census Tract 4.02	Stearns	No	No	No	No	No
Census Tract 1003	Wright	No	No	No	No	No
Census Tract 7907	Todd	No	**Yes**	No	No	**Yes**
Census Tract 4.01	Stearns	**Yes**	**Yes**	No	No	**Yes**
Census Tract 4509	Douglas	No	No	No	No	No
Census Tract 4508	Douglas	No	No	No	No	No

[1] Values adjusted to account for margin of error.
[2] Reference (11)
[3] Reference (12)
[4] Reference (10)



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Project Study Area
Anticipated Alignment
Project Substation
Bypassed Substation
Municipal Boundary
County Boundary

Percent Below the Povery Level*
(by 2020 Census Tract)
< 10%
10 - 20%
20 - 30%
30 - 40%
50 - 60%

**Percentage of families and people whose income in the past 12 months is below the poverty level (2020).*

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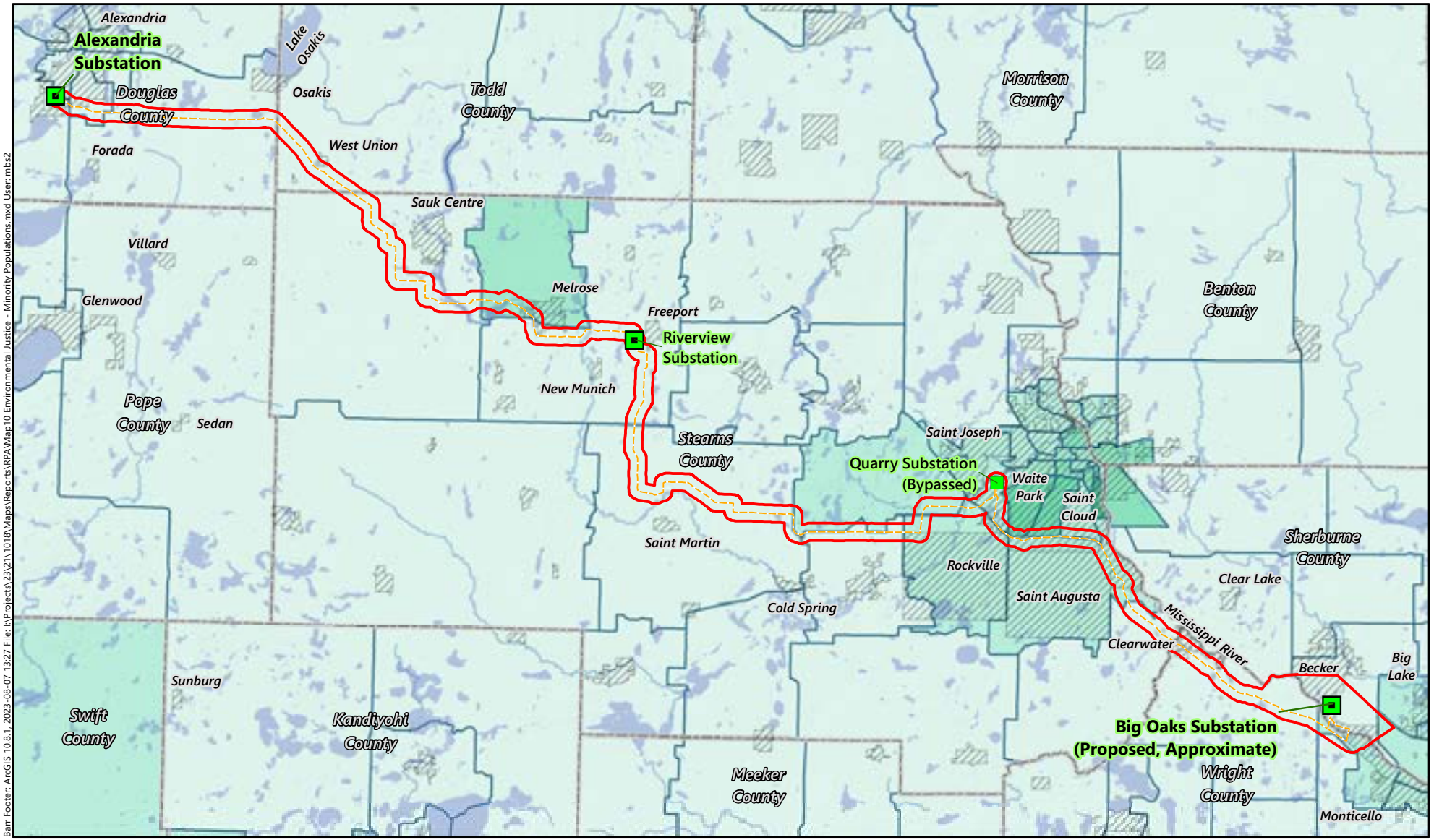
0 8

Data Source: U.S. Census Bureau

Map 9

ENVIRONMENTAL JUSTICE
- LOW INCOME -
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application



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Project Study Area
Anticipated Alignment
Project Substation
Bypassed Substation
Municipal Boundary
County Boundary

Minorities as Percent of Total Population
(by 2020 Census Tract)
< 10%
10 - 20%
20 - 30%
30 - 40%
40 - 50%
50 - 60%

** Percentage of individuals reporting any race other than white (2020).*

Miles
0 8

Data Source: U.S. Census Bureau

Map 10

ENVIRONMENTAL JUSTICE
- MINORITY POPULATIONS -
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application

6.3.6.1 Impacts and Mitigation

Based on the data provided by the U.S. Census Bureau and the MPCA, there are low-income populations and/or minority populations that will be crossed by the Proposed Route. However, the Project is not anticipated to disproportionately affect these communities as discussed throughout Section 6.3.

The Applicants will engage with these potentially affected environmental justice communities to provide equitable access to the planning processes, solicit community input, and work to understand community values. This engagement is likely to occur through Project public outreach, including press releases, Project website, and other efforts. The goals of this engagement include developing initial understanding of potential Project impacts, both beneficial and adverse; gathering preliminary feedback; and establishing an ongoing two-way engagement process. No communities of 40 percent or more people with limited English proficiency were identified in the Proposed Route. Project outreach information was provided by the Applicants is in English but can be made available in languages other than English upon request. Applicants contact information is available in Section 1.3.

Tribal governments and Tribal Historic Preservation Offices, identified through the U.S. Department of Housing and Urban Development's Tribal Directory Assessment Tool or the Minnesota Indian Affairs Council as having historic ties to land in proximity to planned project areas have been notified early in the planning process, so that Tribes have the opportunity to advise of any sensitive historical or cultural sites to be avoided. This is discussed further in Section 7.

6.3.7 Cultural Values

Cultural values consist of shared community attitudes expressed within a given area and provide a framework for community unity. The Proposed Route is generally rural in nature but crosses through several urban/industrial areas including Alexandria, St. Cloud, Becker, and Monticello. Rural portions of the Proposed Route have an agriculture-based economy. Corn and soybean crop production, livestock operations, and associated industries drive the local agricultural economy. Manufacturing, industrial, and service industries (restaurants, hotels, repair shops, power plants, landfill, convenience, and retail stores) are concentrated in the urban areas along the Proposed Route. Farming and protecting agriculture, the land, and the ability to

continue to farm and support livelihoods through agriculture are strong values in the area surrounding the Proposed Route.

Manufacturing, industrial, and service industries (restaurants, hotels, repair shops, power plants, landfill, convenience, and retail stores) are concentrated in the urban areas crossed by the Proposed Route, with St. Cloud representing the largest city along the Proposed Route. St. Cloud has been recognized for its livability, culture and heritage management, and community participation and empowerment (reference (13)). St. Cloud is also home to St. Cloud State University, Minnesota's third-largest public university.

Numerous natural amenities, including lakes, rivers, and WMAs attract local and regional recreational users along the Proposed Route (refer to Section 6.3.8). These areas are also important to the identity of the area and provide opportunities for various recreational activities such as fishing, hunting, and snowmobiling which are also part of the identity of area residents.

6.3.7.1 Impacts and Mitigation

Construction, operation, and maintenance of the Project is not expected to conflict with the cultural values along the Proposed Route. The area is generally rural in nature with an agriculture-based economy and is anticipated to remain so after construction. No aspects of the culture of the area are anticipated to be significantly impacted or changed as a result of the construction and operation of the Project.

6.3.8 Recreation

Recreational opportunities in and near the Proposed Route include outdoor recreational trails, use of public lands and parks, snowmobiling, hunting and fishing, boating, camping and participation in local area events associated with these amenities. There are several types of formally managed and regulated lands near the Proposed Route such as WMAs, WPAs, state water trails, and municipal and county parks and trails. Each of these land types offer many recreational opportunities that attract residents and tourists. There are additional recreational opportunities within the municipalities in and adjacent to the Proposed Route such as museums and festivals. See the Tourism section in 6.4.3 for more information on these potential recreational activities that are not on public lands.

WPAs are lands that were established to conserve migratory bird habitat. The Proposed Route crosses two Douglas County WPA locations and two Stearns County WPA locations. Both WPAs are located in the west end of the Project, west of St. Cloud. WPAs are available for hunting during state-designated hunting seasons.

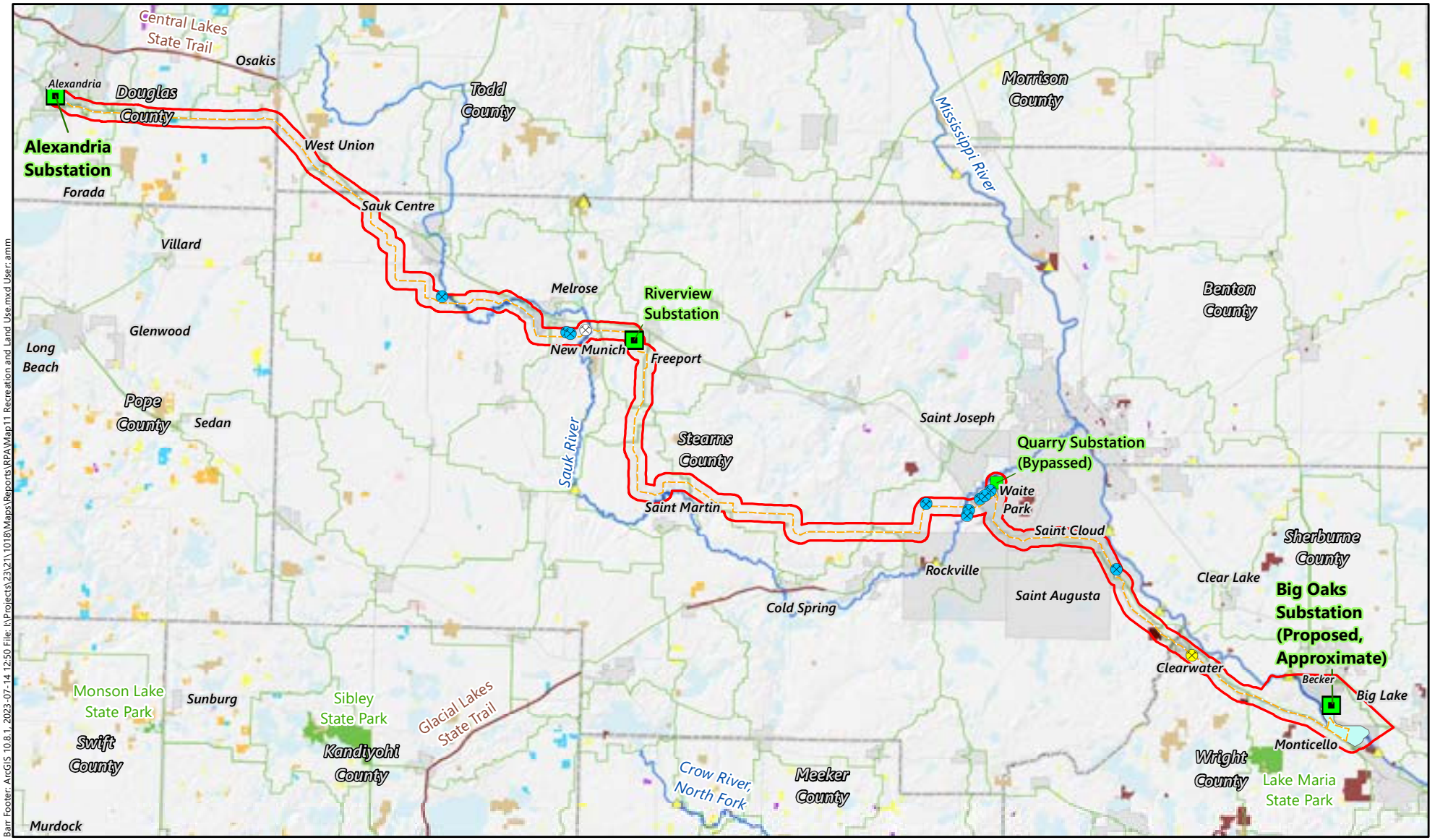
WMAs are part of Minnesota's outdoor recreation system and are established to protect those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses. The Proposed Route crosses one WMA: the Sauk River WMA.

The MDNR manages 35 state water trails covering over 4,500 miles in Minnesota. These trails provide opportunities for canoeing, kayaking, paddleboarding, and camping. The Proposed Route crosses the Sauk River water trail in four locations. Additionally, each of the proposed Mississippi River Crossing Options would cross the Mississippi water trail one time.

Snowmobile trails are mapped by MDNR and managed locally by each county and their respective snowmobile clubs. There are three snowmobile trails in the Proposed Route: one each in Douglas, Stearns, and Wright Counties. At the western end of the Project, the Douglas Area trails parallel and cross portions of the Proposed Route. The Stearns County Snowmobile Trails parallel and cross portions of the Proposed Route between Alexandria and St. Cloud. At the eastern end of the Project, the Wright County Trails parallel and cross the Proposed Route in proximity to the Mississippi River (Map 11).

The Proposed Route crosses two Stearns County parks: a small corner of Warner Lake County Park, just west of Clearwater, Minnesota as well as Lake Wobegon Trail near its inception northwest of Sauk Centre, Minnesota.

There are no MDNR Scientific and Natural Areas, Aquatic Management Areas, state parks, municipal parks, or golf courses in or crossed by the Proposed Route.



Barr Footer: ArcGIS 10.8.1, 2023-07-14 12:50 File: I:\Projects\23\21\1018\Maps\Reports\RPA\Map11 Recreation and Land Use.mxd User: amm

- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Municipal Boundary
- County Boundary
- Campsite (Non-State Park)
- State Park (MDNR)
- County or Local Park

Trails (MDNR)

- State Trail
- Snowmobile Trail
- Water Trails
- Wetland Banking Easement

Conservation Easement (MDNR)

- Conservation Reserve Enhancement Program (CREP)
- Permanent Wetland Preserve (PWP)
- Reinvest in Minnesota (RIM)
- Wetland Reserve Program (WRP)
- Active Gravel Pit
- Potentially Active Mine
- Reclaimed Gravel Pit

0 8 Miles

Data Source:
Minnesota Dept. of Natural Resources

Map 11

RECREATION AND LAND USE
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application

6.3.8.1 Impacts and Mitigation

Construction of the Project is not anticipated to affect public access to nearby recreational opportunities. Impacts to recreation areas would mostly be related to Project construction and will be minimal, temporary, and isolated to specific areas. Because the Project consists largely of stringing a second circuit onto existing infrastructure, construction activities related to the majority of the Project will be minimal. Temporary disruptions to use of the snowmobile trails could occur if Project construction occurs during the winter months. However, any disruptions would be minimal, short-term, and would resolve with the completion of construction.

Short-term increases in noise and dust would occur during construction of the Project and could detract from public enjoyment of nearby recreational activities. However, these impacts would be minimal, and use of BMPs to limit noise and fugitive dust during construction would effectively mitigate their effects. No impacts are anticipated during operation and maintenance of the Project.

6.3.9 Public Services

This section provides information about public services within the Project Study Area including police, fire, and ambulance services; hospitals; water and wastewater services; school districts; utilities; and other public services such as public utility infrastructure. It also discusses whether the Project has the potential to affect these public services.

6.3.9.1 Police, Fire, and Ambulance Services

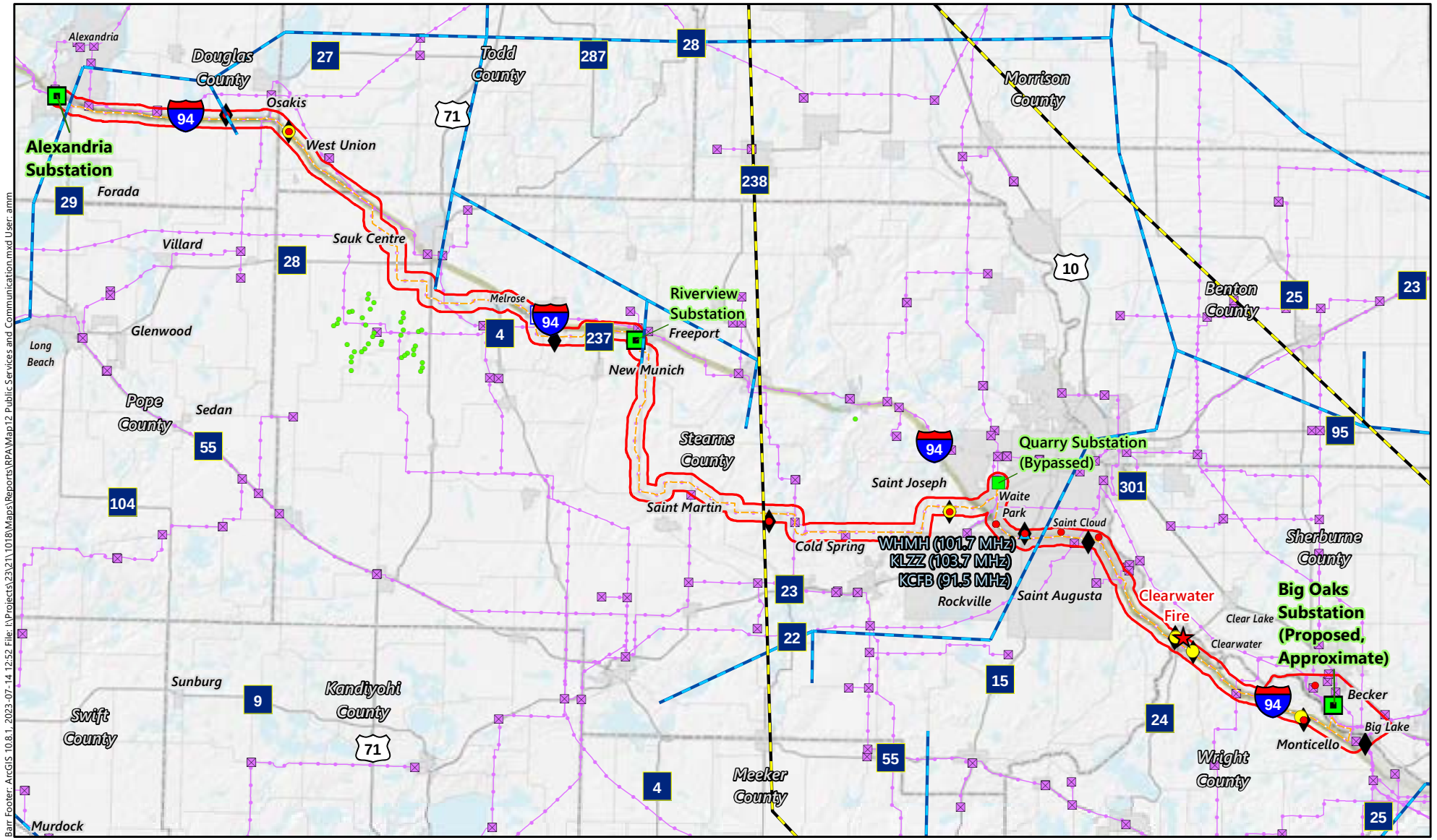
Public services in the Project Study Area are provided by local law enforcement and emergency response agencies of nearby communities. The sheriff's offices and municipal police departments in nearby cities provide law enforcement in the area. Douglas, Todd, Stearns, Sherburne, and Wright Counties all have sheriff departments that provide services to their respective counties. Additionally, the cities of Alexandria, Melrose, Waite Parke, St. Cloud, and Becker all have local police departments.

Fire services within the area are provided by city and community fire departments (Map 12). Alexandria, Freeport, Waite Parke, St. Cloud, Clearwater, and Becker all have paid fire departments that service the surrounding cities and townships. Melrose, Rockville, and Monticello have volunteer fire departments.

Ambulance districts would provide emergency medical response services to the Project. The Central Minnesota EMS Region Ambulance Service and the Gold Cross Ambulance Service of St. Cloud provide response services to cities and townships surrounding St. Cloud including Rockville, Waite Park, Clearwater, Becker, and Monticello. The North Ambulance Service of Douglas County provides response services to Alexandria and other surrounding cities and townships including Melrose and Freeport. Emergency medical response is also available from local hospitals, such as the Douglas County Hospital System in Alexandria and the CentraCare and St. Cloud Hospital Systems, both located in the City of St. Cloud (Map 12).

6.3.9.2 Hospitals

Hospitals near the Project include the Douglas County Hospital System in Alexandria and the CentraCare and St. Cloud Hospital Systems, both located in St. Cloud (Map 12). Smaller medical clinics or medical centers in the area include CentraCare in and around the cities of Melrose, Freeport, Clearwater, and Becker, and Stellis Health for the Monticello area (Map 12).



- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Existing Substation
- Existing High-Voltage Transmission Line
- Wind Turbine
- Microwave Service Site
- FM Radio Transmitter
- Cellular Tower
- Antenna Structure
- Approx. Underground Pipeline
- Crude Oil
- Natural Gas
- Fire Station
- Hospital
- Municipal Boundary
- County Boundary
- Interstate Highway
- US Highway
- State Highway
- County State-Aid Highway

Miles

0 8

Data Sources:
Minnesota Dept. of Transportation,
Minnesota Geospatial Information Office,
Federal Aviation Administration (FAA), Federal Communications Commission (FCC)

Map 12

PUBLIC SERVICES AND COMMUNICATION

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

6.3.9.3 Water and Wastewater Services

In rural areas near the Project, residents often use private septic systems and wells. Douglas and Stearns Counties provide septic system services to rural areas without access to water treatment facilities if they fall within a town, city, or sewer district. In cities and townships around the Project, municipal water and sewer services are provided, including in Alexandria and St. Cloud. Most residences in the Project Study Area have private septic systems.

6.3.9.4 School Districts

School Districts in the Project Study Area include Alexandria Public School District (Independent School District [ISD] 206), Osakis Public School District (ISD 213), Sauk Centre Public School District (ISD 743), Melrose Public School District (ISD 740), Albany Public School District (ISD 745), Rocori Public School District (ISD 750), St. Cloud Public School District (ISD 742), Becker Public School District (ISD 726), Annandale Public School District (ISD 876), and Monticello Public School District (ISD 882).

6.3.9.5 Utilities

Within the Project Study Area, electric utilities are provided by Otter Tail, Alexandria Light and Power, Runestone Electric Association, Melrose Public Utilities, Xcel Energy, Stearns Cooperative Electric Association, Connexus Energy, and Wright Hennepin Electric Cooperative (Map 12). Four crude oil/petrol product pipelines are located within the Project Study Area. These include a crude oil line west of Rockville, two petrol product lines in Alexandria, and a petrol product pipeline that generally follows the Proposed Route from West Union to Clearwater, Minnesota. Five natural gas pipelines also intersect the Project Study Area. Two are in/near Alexandria, one is in St. Cloud, one near Sauk Centre, and one in Freeport, Minnesota. Each of these cross the Proposed Route.

6.3.9.6 Other Public Services

Many other public services are provided in the Project Study Area, primarily within municipalities. Public works and utility departments design, construct, and maintain sanitary sewers, streets and sidewalks, parks, public landscaping, and water mains. Many public facilities exist within incorporated areas in the Project Study Area, including swimming pools, ice rinks, parks, and libraries.

6.3.9.7 Impacts and Mitigation

Potential impacts to public utilities do not vary between Project Components and would be most likely to occur during ground disturbance activities for Project construction and maintenance. Use of heavy equipment during construction presents the potential for injuries such as falls, equipment-use related injuries, or electrocution. Operation of a transmission line presents a potential risk to public safety if the transmission line or structures are damaged by inclement weather or not operated in compliance with safety standards. Injuries resulting from construction or operation of a transmission line project would require use of local emergency services such as police, fire, ambulance, or hospitals; however, impacts to the availability of emergency services as a result of the Project are not anticipated.

The Applicants will utilize available resources and databases such as the Minnesota Department of Health (MDH) Minnesota Well Index and county ordinances regarding setbacks for septic systems along the Route, to understand where wells and private septic systems have the potential to be impacted by the Project so that they can be avoided.

Although unlikely, damage to existing pipelines could occur during grading activities. The Applicants will utilize the Gopher State One-Call system to locate and mark all existing underground utilities prior to construction to avoid impacts on pipelines. If crossing an underground utility is required, the Applicants will use BMPs to protect existing infrastructure while using heavy equipment during construction (e.g., construction matting).

The Applicants will also work with the appropriate authorities (including emergency services) and utility providers to determine where facilities exist and how to best ensure the proper safety precautions are being met. The Applicants may meet with residents and utility providers to prevent direct or indirect impacts to their services. Overall, public services and facilities are not anticipated to be impacted by the construction and operation of the Project.

Because no impacts to public services are anticipated, no mitigation measures are proposed.

6.3.10 Radio, Television, Cellular Phone, and Global Positioning System

Operation of transmission lines has the potential to interfere with reception of radio, television, cellular, and Global Positioning System (GPS) signals. Corona, as well as spark discharge, from transmission line conductors can generate electromagnetic "noise" at the same frequencies that some radio, television, cellular, and GPS signals are transmitted. Electromagnetic noise, which typically occurs from about 0.1 to 50 megahertz (MHz), can interfere with the reception of these signals, depending on the frequency and overall strength of the radio and television signal.

6.3.10.1 Radio

Amplitude modulation (AM) and frequency modulation (FM) radio broadcasting stations that operate or can be heard within the Project Study Area include KVSC (88.1 FM St. Cloud), KCFB (91.5 FM St. Cloud), KXRA-FM (92.3 FM Alexandria), KULO (94.3 FM Alexandria), WROJ-LP (96.1 FM St. Cloud), KVEX-LP (97.5 FM St. Cloud), WWJO (98.1 FM St. Cloud), KLKX-LP (98.5 FM Alexandria), KXRZ (99.3 FM Alexandria), KLZZ (103.7 FM Waite Park), KCLD-FM (104.7 FM St. Cloud), KZYS-LP (105.1 FM St. Cloud), KYES (1180 AM Rockville), WJON (1240 AM St. Cloud), KXSS (1390 AM Waite Park), KNSI (1450 AM St. Cloud), and KXRA (1490 AM Alexandria).

6.3.10.2 Television

There are more than 45 television channels broadcast in the Project Study Area. These channels would be received from cities including Alexandria, Melrose, Freeport, Waite Park, Rockville, St. Cloud, St. Augusta, Clearwater, Becker, and Monticello, Minnesota. Due to the Project's proximity to the Twin Cities, television broadcasts from the Twin Cities Metro area are also received within the Project Study Area.

6.3.10.3 Cellular Phone

There are 10 cellular phone towers located within the Project Study Area (Map 12). Several cellular phone service providers operate in the vicinity of the Proposed Route, including Boost Mobile and Cricket Wireless. Larger carriers such as Verizon Wireless, T-Mobile, and AT&T, offer service in the area and have stores located in Alexandria and St. Cloud, Minnesota.

6.3.10.4 Global Positioning System

GPS applications are important components of daily life, used in aviation, vehicle navigation, surveying, and agricultural activities. GPS equipment relies on satellites and typically mobile receiver equipment to provide locational information for navigation between endpoints, as well as geographic orientation for farm and other equipment. GPS equipment is likely used throughout the Project Study Area.

6.3.10.5 Impacts and Mitigation

No impacts on radio, television, cellular phones, or GPS units are expected from construction or operation of the Proposed Route or the substation options being considered for the Project.

AM radio frequencies are most affected by corona-generated noise; however, interference from a spark discharge source can be found and corrected. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way to either side. If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by the appropriate modification of (or addition to) the receiving antenna system.

Television broadcast frequencies are typically high enough that they are not affected by corona-generated noise. In particular, digital and satellite television transmissions are not affected by corona-generated noise because they are dependent on packets of binary information or transmitted in the Ku band of radio frequencies (12,000 to 18,000 MHz), respectively. Digital and satellite transmissions are more likely to be affected by multi-path reflections (shadowing) generated by nearby towers. In addition, line-of-sight interference from transmission line structures can affect satellite television transmissions. The use of shielded coaxial cable for cable television transmittals generally makes them insusceptible to interference from electromagnetic noise. Interference to digital and satellite signals as a result of the Project is not anticipated. If interference to these signals were to occur from multi-path reflections or line-of-sight interference, such interference can be mitigated by use of an outdoor antenna to improve digital signals or by moving the affected satellite antenna to a slightly different location.

Cellular phone signals use an ultra-high frequency, generally around 900 MHz, which is significantly higher than the range of electromagnetic noise generated by transmission line conductors. GPS signals operate at a higher frequency as well, within the range of 1,225 to 1,575 MHz. Because both cellular phone signals and GPS operate at frequencies outside the range of electromagnetic noise generated by transmission line conductors, the risk of interference is negligible.

6.3.11 Transportation

Transmission line projects have the potential to affect local transportation networks such as roadways, railroads, airports, and airstrips. Use of heavy equipment during construction may damage existing road surfaces, and local roadways could experience temporary road and/or lane closures during construction. Co-location of transmission lines with existing public roads could limit future roadway expansion or realignments and could interfere with routine maintenance of roadways. In addition, if a transmission line is sited too close to an operating railroad, it could interfere with safe operation of the railroad.

HVTLs can present safety concerns to airports and aircraft. An airport, whether public or private, is defined by the state and the Federal Aviation Administration (FAA) as an area of land or water that is used or intended to be used for the landing and takeoff of aircraft, and includes its buildings and facilities, if any (14 C.F.R. Part 1, §1.1 and Minn. R. 8800.0100, subpart 3). The placement of transmission line structures or the stringing of conductors between structures could impact the safe operation of an airport or hinder the maneuverability of aircraft. If close enough, the presence of a steel transmission line structure or wiring could interfere with the operation of air navigation or weather systems. Conductors can also present a risk to pilots.

The physical dimensions of airport runways determine the class size of aircraft capable of landing at an airport. Furthermore, the aircraft design and propulsion system are determinants in an aircraft's ability to land at a given facility. For example, jet aircraft are heavier, typically require a greater runway length for take-off and landing and require more glide slope clearance distance compared to propeller-driven aircraft. Both factors are important in relation to structures such as transmission lines because they determine the take-off and landing glide slopes necessary for safe flight

operation, which in turn determine the setback distance of structures such as transmission line structures.

The FAA and Minnesota Department of Transportation (MnDOT) have established development guidelines on the proximity of structures, including HVTLs, to public use airports and heliports. Federal Aviation Regulation (FAR) Part 77 establishes standards and notice requirements for reporting airspace obstructions for objects currently impacting or that could impact navigable airspace around aviation facilities. FAR Part 77 defines a series of imaginary surface zones surrounding airports that specify height restrictions for structures based on slope ratios. These imaginary surfaces include the primary surface, horizontal surface, conical surface, approach surface, precision instrument approach surface, and the transitional surface. According to FAR Part 77, "an object will be considered an obstruction to a public airport (excluding seaplane bases and heliports) if it is of greater height" than any of the aforementioned imaginary surfaces. Each of these imaginary surfaces have corresponding slopes, based in part on the airports' use designation, flight volumes, and plane size capabilities. All surfaces are measured at the mean sea-level elevation of the airport. If necessary or appropriate, Applicants will file the required notice with FAA pursuant to the requirements set forth by FAR Part 77, Subsection 13.

In addition to FAA regulations, the state of Minnesota establishes air navigation obstruction criteria under Minn. Stat. § 360.018 and Minn. R. 8800. These regulations are intended to control the type of development around airports to prevent incompatible land uses. The state regulations are similar to the FAA regulations as published in FAR Part 77. Runway Safety Zones A through C, which follow the runway approach zones and restrict specific types of development, are included as this part of these regulations. The most restrictive safety zones are A and B; Safety Zone A does not allow any buildings or temporary structures, places of public assembly or transmission lines; Safety Zone B does not allow places of public or semipublic assembly (i.e., churches, hospitals, or schools). Permitted land uses in both zones include agricultural uses, cemeteries, and parking lots. A complete description and copy of the Airport Zoning Standards can be found at http://www.dot.state.mn.us/aero/avoffice/planning/zoning.html.

Furthermore, certain objects such as steel pole transmission line structures have the potential to conflict with the operation of airport navigational aids and weather

observation station facilities. Specifically, these facilities include Very High Frequency Omnidirectional Radio Range (VOR) air navigation systems and Automated Weather Observation Stations. FAA Order 6820.10 "VOR, VOR/DME, and VORTAC Siting Criteria," specifies the distance setback requirements for trees, buildings, and metallic structures. Within this order, Chapter 4, Section 17(c)(3) identifies obstruction criteria for a VOR facility. Subsections D and E detail setback distances for transmission line structures. These regulations specify that overhead transmission line structures with conductors should be located beyond 1,200 feet of the VOR antenna to avoid communication interference.

Additionally, metallic structures are required to subtend vertical angles of 1.2 degrees or less, measured from the ground elevation of the VOR facility. Therefore, the new transmission line structures proposed for the Project that are 130 feet tall must be 6,206 feet away from a VOR air navigational station to avoid interference with the operation of the facility. Transmission structures 140 feet in height must be 6,683 feet away, and transmission structures 175 feet in height must be 8,354 feet away from a VOR.

Online research was completed to identify roadways, railroads, airports, and airstrips within the Project Study Area. The results of this review and a discussion of potential impacts to these features from construction and operation of the Project is presented below.

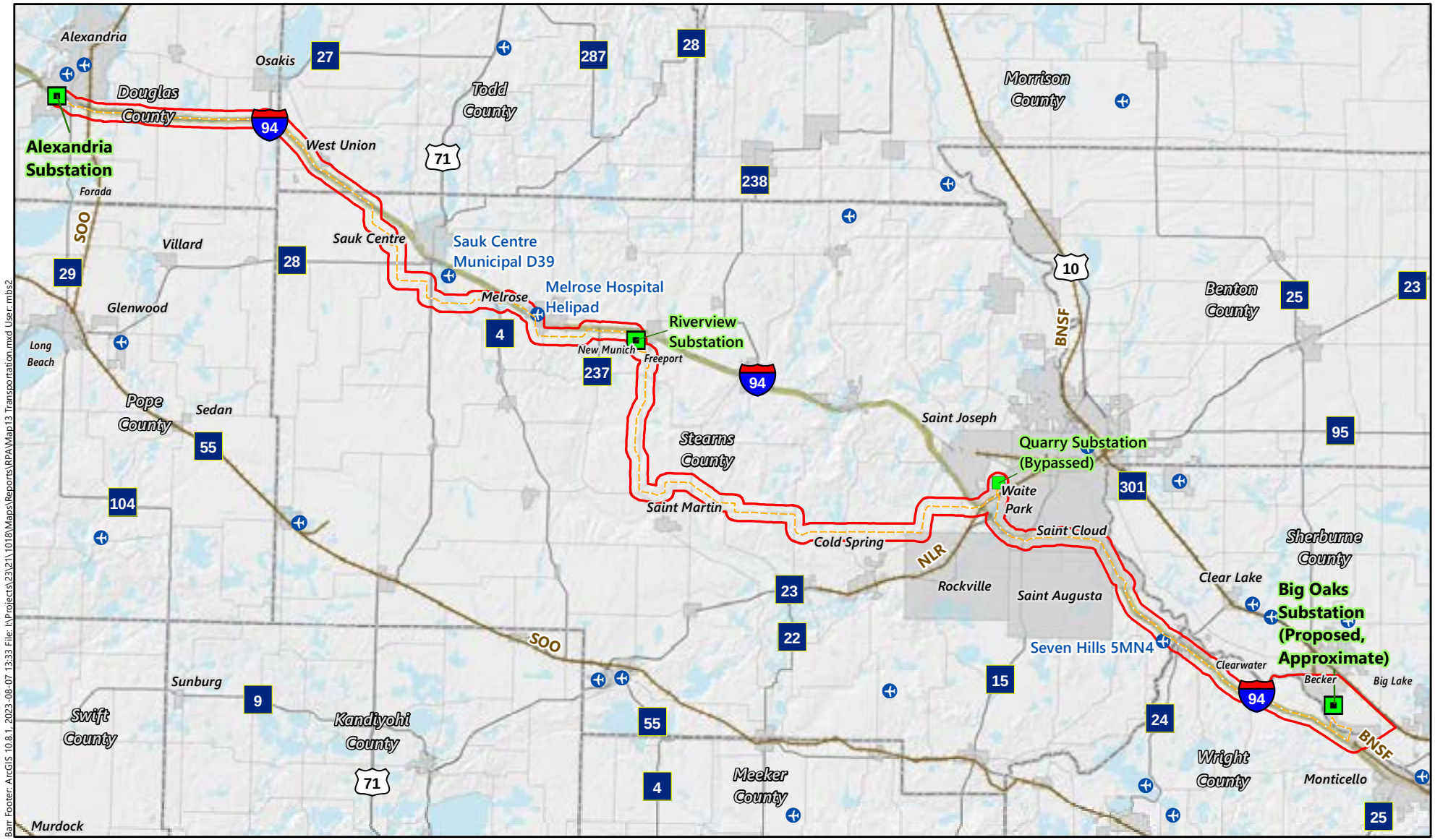
6.3.11.1 Roadways and Trails

The Project crosses approximately 101 roads (Map 13). Of these, 41 represent interstate, state, or county highways. The remaining 60 roads are owned and operated at the township or municipal level. Near Alexandria, the Proposed Route parallels MN 27 and I-94. The Proposed Route also parallels I-94 outside of Melrose. South of Freeport, the Proposed Route parallels County State-Aid Highway (CSAH) 11. The Proposed Route again parallels I-94 in Waite Park, St. Cloud, and Clearwater. Finally, the Proposed Route parallels CSAH 75 in Clearwater and south of Becker. Major roads crossed by the Proposed Route include Minnesota Trunk Highway (MN) 29, CSAH 23, CSAH 17, CSAH 2, 137th Ave in West Union, MN 28, MN 4, Overton Road in Melrose, MN 237, CSAH 30, CSAH 10, CSAH 41, CSAH 50, CSAH 2, CSAH 138, MN 23, CSAH 6, MN 15, CSAH 74, CSAH 136, Roosevelt Road in St. Cloud, CSAH 75, and MN 24.

With the exception of I-94, MN 23, and MN 29, traffic volumes are relatively low on roads crossed by or running parallel to the Proposed Route where traffic data is available (Table 6.3-9). Annual Average Daily Traffic rates, as available through the MnDOT (reference (14)), are highest on I-94 as measured near Alexandria, Melrose, and St. Cloud. They are lowest on the CSAHs in and around the Project.

Table 6.3-9 Annual Average Daily Traffic on Roads Crossed by or Co-located with the Proposed Route

Road	City	County	Annual Average Daily Traffic (AADT)	Traffic Count Year	Co-located Distance (feet)	Notes
CSAH 11	S of Freeport	Stearns	1,000	2017	24,450	N of CSAH 30
CSAH 2	N of Rockville	Stearns	3,850	2017	7,150	S of CR 139 (270th Street)
CSAH 23	Alexandria	Douglas	1,250	2018	160	N of US 52
CSAH 30	S of Freeport	Stearns	355	2017	150	E of CSAH 11
CSAH 50	W of Rockville	Stearns	1,700	2017	170	NW of CR 160
CSAH 75	Becker	Wright	1,600	2016	18,900	NW of 120th St NE
CSAH 75	St. Cloud	Stearns	3260	2021	2,300	SE of MSAS 161
I-94	Alexandria	Douglas	21,093	2021	56,950	AADT impacted by COVID
I-94	Melrose	Stearns	28,500	2017	9,900	SE of MN 4
I-94	St. Cloud	Stearns	38,064	2021	87,400	AADT impacted by COVID
I-94	St. Cloud	Stearns	42,000	2017	87,400	E of MN 15
MN 23	Waite Park	Stearns	17,000	2019	2,300	NE of I-94
MN 29	Alexandria	Douglas	10,624	2021	180	N of CR 87
MN 27	S of Osakis	Douglas	3,500	2018	63,000	N of I-94
MN 4	Melrose	Stearns	830	2017	165	S of I-94



- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Municipal Boundary
- County Boundary
- Airport/Heliport (MNDOT, FAA)
- Railroad
- Interstate Highway
- US Highway
- State Highway
- County State-Aid Highway

Miles

8 0 8

Data Sources: Minnesota Dept. of Transportation, Federal Aviation Administration

Map 13

TRANSPORTATION

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

Review of the Minnesota State Transportation Improvement Program (reference (15)) as well as the St. Cloud Area Planning Organization Transportation Improvement Program (reference (16)) for 2023-2026 indicates there is one funded roadway project within the Proposed Route. This improvement project consists of extending Beaver Island Trail from the St. Cloud city limits to Stearns County Road 143 just west of Clearwater and is funded for construction in 2023. A portion of the trail will be located next to CSAH 75, and the Proposed Route will cross the proposed trail. However, in this area the Project consists of stringing a second 345 kV circuit on existing transmission structures so these existing structures would already be considered in the planning for this improvement project.

6.3.11.2 Railroads

The Proposed Route crosses two active rail lines, the SOO Line Railroad (SOO) that runs through Alexandria from West Glenwood to Thief River Falls, and a Northern Lines Railway (NLR) line that runs from Cold Spring to St. Cloud (Map 13). Big Oaks Substation Siting Area includes a portion of a BNSF Railway line related to the Monticello Nuclear Generating Plant in Becker.

6.3.11.3 Airports and Airstrips

There are no operating public-use airports or heliports in the Project Study Area. There is one private-use airport and one private heliport within the Project Study Area (Map 13). Both airports are located along the existing infrastructure. The Seven Hills Airport (5MN4) occupies eight acres west of Clearwater, Minnesota and has one runway. The Seven Hills Airport is approximately 0.3 miles south of existing infrastructure permanent right-of-way. Seven Hills Airport is considered a personal-use airport under state law. Melrose Hospital, located in Melrose, has a helipad for their use in medical emergencies. The Melrose Hospital heliport is approximately 0.2 miles north of the existing infrastructure permanent right-of-way. The nearest public airport is Chandler Field, located approximately 1.06 miles north of the Proposed Route in Alexandria. There are no known private landing strips in the Project Study Area. There are no airports located within the vicinity of the Alexandria Substation Tap, Riverview Substation Bypass, Quarry Substation Bypass, or the Mississippi River crossing.

Aerial crop dusting can be an important part of agricultural activities within the Project Study Area and various fields crossed by the Application segments may be subject to these activities.

6.3.11.4 Impacts and Mitigation

Construction activities are anticipated to be similar across Project Components and are not expected to permanently or significantly impact transportation in the Project Study Area.

6.3.11.4.1 Roadways and Trails

Construction could create a minor increase in traffic from construction vehicles and material/equipment delivery along roadways; however, this increase would be temporary and traffic volumes would return to normal conditions after construction activities are completed. Line construction and maintenance at crossing locations could also cause temporary delays if maintenance vehicles are present. To minimize overall impacts, the Applicants will limit vehicle traffic to the Project right-of-way and existing access points to the extent feasible.

Temporary road or lane closures may occur during the construction process to ensure safety of the construction crews and the traveling public. While the line is being constructed, the electrical conductors will be strung on support structures using a pulley system or a tensioner mounted on the back of a digger/derrick truck. At road crossings, roads or lands may be temporarily closed for safety purposes when stringing electrical conductors between support structures. These closures could range in duration from minutes to hours based on the width of the road and the complexity of the crossing. Temporary closings are not expected to have significant impacts on transportation in the area because of the generally rural nature of the area and subsequent low traffic levels on most roads. Once an aerial crossing is completed, the road(s) will be reopened to allow normal traffic flow.

The Proposed Route parallels I-94 in several locations, including near Alexandria, Melrose, and between Waite Park and Becker, Minnesota. Any occupation of state highway right-of-way requires a Utility Permit from MnDOT, per Minn. R. 8810.3100 to 3600. MnDOT's Accommodation Policy provides requirements and guidelines for the installation of utility facilities in and along MnDOT rights-of-way, which the Project was developed to meet. The Applicants have begun coordinating with

MnDOT and will continue to work with MnDOT throughout the Route Permit process to ensure that the alignment meets MnDOT guidelines.

After the completion of construction, the Applicants will confirm that township, city, and county roads used for purposes of access during construction are returned to either the condition they were in or better before right-of-way clearing began. The Applicants will meet with MnDOT, township road supervisors, city road personnel, and/or county highway departments as necessary to address any issues that arise during construction with roadways, to ensure the roads are adequately restored after construction is complete.

Although there is one roadway improvement project, a new trail, planned within an area that will be crossed by the Proposed Route, this portion of the Project consists of double-circuiting new line on existing transmission structures. Additionally, the new trail is planned to be constructed in 2023 and will be finished prior to construction of the Project.

6.3.11.4.2 Railroads

Impacts to railroads are not anticipated as a result of construction and operation of the Project. The Applicants will obtain all necessary railroad crossing permits from SOO, NLR, and BNSF for crossing their rail lines. The Applicants will also coordinate with the appropriate railroad personnel during construction to schedule electrical conductor stringing over the rail line for the safety of construction personnel and rail line operations.

6.3.11.4.3 Airports and Airstrips

No impacts to airports or airstrips, including the Seven Hills Airport, are anticipated as a result of the Project. The Applicants will coordinate with the FAA and MnDOT to address any Project-related concerns for aviation activities as the Project progresses, if necessary.

Crop-dusting operations servicing fields crossed by existing transmission lines will have already accommodated the presence of a transmission line. The Applicants will mail notice of the Application filing to aerial applicators registered with the Minnesota Agricultural Aircraft Association in the Project Study Area.

6.4 Land-Based Economies

This section summarizes the potential impacts the Project would have on naturally occurring resources within the Project Study Area. Construction and operation of the Project has the potential to affect land-based economies in Douglas, Todd, Stearns, Sherburne, and Wright Counties through a physical, long-term presence which could prevent or otherwise limit use of the land for other purposes. The following subsections present an overview of agricultural, forestry, tourism, and mining operations in the Project Study Area and discusses how the Proposed Route may affect these industries and what measures the Applicants will implement to mitigate Project effects.

6.4.1 Agriculture

As described in Section 6.2, the predominant land cover type in the Proposed Route is cultivated cropland, and 25 percent of the soils in the Proposed Route are defined as prime farmland (Section 6.6.4). In 2017, the average farm size in the counties crossed by the Proposed Route was 217.6 acres, which is smaller than the 371-acre average for all of Minnesota farms (Table 6.4-1). Crop sales account for a larger percentage of total market value of agricultural products compared to livestock sales in Douglas, Sherburne, and Wright Counties. In Todd and Stearns Counties, livestock sales account for the majority of total market value of agricultural products compared to crop sales (reference (17)).

Table 6.4-1 Agricultural Statistics of Counties Crossed by the Proposed Route

Location	Number of Farms	Average Farm Size (acres)	Land in Farms (acres)	Crop Sales	Livestock Sales
Minnesota	68,822	371	25.5 million acres (45.8% of state)	$10 billion (55.4%)	$8 billion (44.6%)
Douglas	960	274	263,265 (65% of county)	$74 Million (73.9%)	$26 million (26.1%)
Todd	1,604	208	333,408 (55% of county)	$56 million (31.6%)	$122 million (68.4%)
Stearns	2,951	221	650,821 (73% of county)	$179 million (23.9%)	$568 million (76.1%)
Sherburne	501	205	102,544 (37% of county)	$75 million (83.9%)	$14 million (16.1%)
Wright	1,338	180	240,651 (57% of county)	$112 million (57.5%)	$83 million (42.5%)

Source: reference (17)

Prime Farmland, Prime Farmland if Drained, and Farmland of Statewide Importance are described in Section 6.6.4.

The Conservation Reserve Enhancement Program (CREP) is a voluntary program that pays farmers an annual fee in exchange for taking environmentally sensitive land out of agricultural production to improve environmental health and quality (reference (18)). No agricultural areas along the Proposed Route are part of the CREP.

6.4.1.1 Impacts and Mitigation

Temporary construction impacts on agricultural land are consistent across Project Components and could include soil compaction and rutting, accelerated soil erosion, crop disturbance, disruption to normal farming activities, and introduction of noxious weeds to soil surface. Construction would occur throughout the year, with an effort made to schedule construction during frozen ground conditions. During the winter, impacts are not anticipated to affect agricultural activities as crop fields are unplanted and the ground is frozen. The Applicants would implement measures to reduce compaction, soil erosion, and sedimentation and would compensate producers for crop damage. As stated in Section 5.3, farmers would be compensated for crops damaged during the construction process and future year crop loss due to soil compaction. Construction, restoration, and maintenance activities would follow a U.S.

Department of Agriculture (USDA) approved AIMP. A draft AIMP and a draft Vegetation Management Plan (VMP) are included in Appendix F and Appendix G. Both crop and livestock activities would be able to continue around Project facilities after construction.

While anticipated alignments were developed with attention to minimizing farmland impacts, permanent impacts to farmland would occur where structures are placed in cultivated fields. It should be noted that a majority of the structures for the Project are already in place and the stringing of the second line will not have additional impacts on agriculture. Structures in fields act as barriers and can hinder efficient operation of large machinery. Both crop and livestock activities would be able to continue around Project facilities after construction, but at an increased difficulty to the farmer. Structures would be placed approximately 1,000 feet apart to minimize the number of structures on farmland.

Structure configuration can influence the degree of permanent impacts. Where a transmission line follows a road, structures are placed approximately 10 feet into the field from the road right-of-way and are therefore counted as impacting farmland. Where routes follow property lines, a monopole would be constructed on the property line and therefore is not counted as an impact.

Table 6.4-2 summarizes the amount of cropland that occurs in the right-of-way. The cropland within the right-of-way has the potential of being impacted by the construction and operation of new structures. The number of new structures that would be placed in fields varies depending on substation locations.

Table 6.4-2 Summary of Impacts of Proposed Route and Proposed Alignments on Cropland

Resource	Alexandria Tap	Existing Transmission Line Second Circuit	Riverview Bypass	Quarry Substation Bypass	Mississippi River Western Crossing Option	Mississippi River Eastern Crossing Option	Big Oaks Substation	Route Width
Route Length (miles)	0.21	103.82	0.45	0.16	0.70	3.43	N/A	N/A
Right-of-way (acres)	3.96	1887.72	5.88	2.88	12.70	62.30	249.81	3824.71
Cropland in right-of-way (acres)	4.31	915.93	4.42	0.35	0	0.52	176.85	1348.94
New Structures in Fields	1	33	2	0	0	1	N/A	N/A

6.4.2 Forestry

The Proposed Route is dominated by cultivated cropland, with wooded lands including deciduous forest, evergreen forest, mixed forest, and woody wetland making up 854.4 acres or approximately 22 percent of the Proposed Route. There are no commercial forest operations identified within the Proposed Route. Specific land cover types are further detailed in Map 7. According to the MDNR forest inventory, there are no forest inventory areas within the Proposed Route (reference (19)). Impacts on forest resources will occur at locations where trees need to be cleared within the right-of-way. For potential impacts to vegetation, see Section 6.6.5.

6.4.2.1 Impacts and Mitigation

Since there are no known commercial forestry operations in the vicinity of the Proposed Route, there are no anticipated impacts to commercial forestry operations with the construction and operation of the Project. Impacts on wooded lands have been reduced by minimizing the tree clearing to the extent feasible. As a result, no mitigative measures are proposed.

6.4.3 Tourism

Tourism in the vicinity of the Proposed Route centers around outdoor recreational activities described in Section 6.3.8. Residents and tourists enjoy recreational areas such as state and county parks, WMAs, WPAs, state water trails, and snowmobile trails. Local economies benefit from tourists who travel from outside the region to enjoy these recreational amenities.

6.4.3.1 Impacts and Mitigation

Construction of the Project is not anticipated to affect available tourism opportunities. Impacts to tourism would be similar to those related to recreation noted in Section 6.3.8 and mostly be related to Project construction, which will be temporary and isolated to specific areas throughout the Proposed Route. To the extent practicable, the Applicants would plan the construction timeline for winter, to avoid the higher volume recreation seasons at these public lands.

6.4.4 Mining

Mining does not comprise a major industry in the Project Study Area and is only identified in one county within the Proposed Route. Stearns County is mapped as

having crushed stone and granite mines (reference (20)). Sand and gravel are primarily mined for making concrete for highways, roads, bridges, and buildings.

There are no active aggregate pits within the Proposed Route. There is one reclaimed aggregate pit located within the Proposed Route (Map 11). Data indicates one small, potentially active site within 500 feet of the alignment that is outside of Clearwater, Minnesota; however, based on review of recent aerial photography, this site does not appear to be an aggregate source.

As shown on Map 11, there are ten active gravel pits within the Project Study Area that are outside of the Proposed Route.

6.4.4.1 Impacts and Mitigation

Because no active mines are within the Proposed Route, construction and operation of the Project Components would have no impacts and mitigative measures are not proposed. Prior aggregate mining within the Project Study Area suggests some constructability considerations that the Applicants would need to plan for in Project design.

6.5 Archaeological and Historic Resources

Cultural resources, including archaeological sites and historic architectural resources, provide important information about the history of human occupation and alteration of the landscape over time. Archaeological resources include any location that contains material remains of past human life or activities, or other places and/or items that possess cultural importance to individuals or a group. Historic architectural resources include standing structures, such as buildings and bridges, as well as historic districts and landscapes.

Background research on known cultural resources was conducted in March 2023 by requesting information from the Minnesota State Historic Preservation Office (SHPO) as well as reviewing the Minnesota Office of the State Archaeologist Portal for archaeological sites. Data regarding known cultural resources identified through previous professional cultural resources surveys and reported archaeological sites and historic architectural resources were reviewed. This information was gathered for the Project Study Area, and then refined to determine known archaeological and historic architectural resources within the Proposed Route for the Project.

The Proposed Route and associated substation options are located within the Central Lakes Deciduous Archaeological Region (Region 4), which covers most of central Minnesota (reference (21)).

Archaeological sites in the Central Lakes Deciduous Region tend to be associated with lakes and major rivers throughout time. Precontact sites, including small campsites, specialized activity sites, and larger village sites are found along major rivers and larger lakes (reference (22)). At contact with Euro-Americans, Santee Dakota groups occupied the eastern part of the Central Lakes Deciduous Region and other Dakota groups such as the Yankton and Yanktonai controlled the western part. The Ojibwe began to move into the northern part of the region in the mid-1700s and controlled this area by the early 1800s (reference (22)). Historic Native American villages were generally located near wild rice beds. By the late 1600s, French traders had entered the region and established posts on some major lakes and rivers, a pattern generally followed by later Euro-American settlers (reference (22)).

6.5.1 Previously Recorded Cultural Resources

Within the Project Study Area, 79 historic architectural resources and 13 archaeological resources have been documented (Appendix H). The historic architectural resources include houses, farmsteads, bridges, and churches. The archaeological sites include precontact artifact scatters and isolated finds as well as one structural ruin and one historic artifact scatter.

Of these, only two archaeological sites and one historic architectural resource are located within the Proposed Route. The previously recorded archaeological sites, 21SH0068 and 21SH0169, both consist of precontact lithic isolate sites. Site 21SH0068 is within the Big Oaks Substation Siting Area while site 21SH0169 is northwest of Clearwater, Minnesota within the existing infrastructure right-of-way. Neither site is eligible for the National Register of Historic Places; therefore, construction activities would not need to be altered to avoid these sites.

The previously recorded historic architectural resource consists of the St. Cloud, Mankato & Austin Railroad (SN-SJT-003), which is within the Proposed Route near the Quarry Substation Bypass. The St. Cloud, Mankato & Austin Railroad is considered eligible for the National Register of Historic Places.

A Phase Ia cultural resources literature review report is currently being prepared for the Project and will be submitted to the Minnesota SHPO for their review and comment concurrent to this Application.

6.5.1.1 Impacts and Mitigation

Impacts to cultural resources within the Proposed Route may occur where ground disturbance is necessary for Project construction and maintenance.

6.5.1.1.1 Existing Transmission Line Second Circuit

Because the Project consists largely of stringing a second circuit onto existing infrastructure, ground disturbance related to this portion of the Proposed Route will be minimal; therefore, the majority of this portion of the Project will not result in impacts to cultural resources.

Impacts to cultural resources would have the potential to occur in areas where the new structures are proposed. Each new structure foundation will result in approximately 115 square feet of disturbance within the existing infrastructure right-of-way. Archaeological resources are most likely be located on or near elevated landforms near permanent water sources. Historic architectural resources would most likely be located near existing municipalities, farmsteads, and infrastructure such as roads and bridges.

In addition, the Proposed Route crosses resource SN-SJT-003, the St. Cloud, Mankato & Austin Railroad, near the Quarry Substation Bypass. This resource is eligible for the National Register of Historic Places. However, as the existing infrastructure already crosses this resource in this area and no new construction is anticipated in its vicinity, the Project is not anticipated to adversely affect this resource.

The Applicants are planning to conduct field surveys in areas of new ground disturbance that could contain previously unrecorded cultural resources. If archaeological or historic architectural resources are identified as a result of field surveys, the Applicants will work with the Minnesota SHPO to identify measures to avoid, minimize or mitigate effects to these resources if any are determined listed or eligible for listing in the National Register of Historic Places.

If archaeological resources are discovered during construction, ground-disturbing activity will be halted in that location, the Minnesota SHPO will be notified, and appropriate measures will be developed in conjunction with the Minnesota SHPO to assess and protect the resource. Additionally, if unanticipated human remains or burial resources are discovered during construction, they will be reported to the State Archaeologist per Minn. Stat. § 307.08 and construction will cease in that area until adequate mitigation measures have been developed between the Applicants and the State Archaeologist.

6.5.1.1.2 Alexandria Substation Tap

As the Alexandria Substation Tap would include the construction of one new structure in what is currently an agricultural field, this portion of the Project has the potential to impact cultural resources, should any be present. The area in which Alexandria Substation is proposed to be expanded appears to consist of previously disturbed land adjacent to the existing substation. As a result, this area has low potential to impact cultural resources. The need for field survey, the Minnesota SHPO coordination, and methodology to be followed in the event of an unanticipated discovery would apply as described in Section 6.5.1.1.1.

6.5.1.1.3 Riverview Substation Bypass

The Riverview Substation Bypass would include the construction of five new structures and an expansion of the substation in what are currently agricultural fields. As a result, this portion of the Project has the potential to impact cultural resources, should any be present. The need for field survey, the Minnesota SHPO coordination, and methodology to be followed in the event of an unanticipated discovery would apply as described in Section 6.5.1.1.1.

6.5.1.1.4 Quarry Substation Bypass

As the Quarry Substation Bypass would include the construction of one new structure in what is currently a wooded tree line, this portion of the Project has the potential to impact cultural resources, should any be present. The need for field survey, the Minnesota SHPO coordination, and methodology to be followed in the event of an unanticipated discovery would apply as described in Section 6.5.1.1.1.

6.5.1.1.5 Big Oaks Substation

The Big Oaks Substation will result in approximately 10 acres of new ground disturbance within what is currently agricultural field or shrub/scrub vegetation. In addition, one previously recorded archaeological site (21SH0068) is within the Big Oaks Substation Siting Area, suggesting increased potential for additional, undocumented cultural resources in the area. The need for field survey, the Minnesota SHPO coordination, and methodology to be followed in the event of an unanticipated discovery would apply as described in Section 6.5.1.1.1.

6.5.1.1.6 Mississippi River Crossing Options

Two options are being considered for a new crossing over the Mississippi River to the new Big Oaks Substation. The Western Crossing Option would be approximately 0.7 miles long and result in the construction of five new structures in what appears to be previously undisturbed land. The Eastern Crossing Option would be approximately 2.1 miles long and require the construction of 15 new structures in what appears to be previously undisturbed land. As a result, each of the options being considered has the potential to result in impacts to cultural resources, should any be present within the option that is ultimately selected.

The need for field survey, the Minnesota SHPO coordination, and methodology to be followed in the event of an unanticipated discovery would apply as described in Section 6.5.1.1.1.

6.6 Natural Environment

Transmission lines have the potential to impact natural resources through temporary, construction-related impacts and long-term impacts to air quality, geology and groundwater, soils, water resources, flora, and fauna.

6.6.1 Air Quality

Section 109(b) of the Clean Air Act (CAA) requires that the EPA establish National Ambient Air Quality Standards (NAAQS) "requisite to protect" public health and welfare (40 Code of Federal Regulations [CFR] Part 50). The CAA identifies two classes of NAAQS: primary standards, which are limits set to protect the public health of the most sensitive populations, such as asthmatics, children and the elderly; and secondary standards which are limits set to protect public welfare, such as protection against visibility impairment or damage to vegetation, wildlife and structures.

Compliance with the national and state air quality standards in the state of Minnesota is assessed at the county level. The EPA designates all of the counties within the Proposed Route, including Douglas, Todd, Stearns, Wright, and Sherburne counties, to be in attainment for all NAAQS (reference (23)).

The MPCA published a map of outdoor air quality data using data from the 2017 air emissions inventory. The map groups Minnesota counties by evaluation of air pollution score, fine particles ranking, top four air pollutants, and pollutants above health benchmark. Excepting the St. Cloud area of Stearns County and the Monticello area of Wright County, the air quality for all counties impacted by the Project is in the lowest risk category of air pollution score, 0 - 1.05, and have no pollutants reported above health benchmark. The Monticello area of Wright County is in the next lowest category of air pollution score, >1.05 – 2, and has no pollutants reported above health benchmark. St. Cloud, MN is a larger metropolitan area that contains more air quality sites than the other impacted regions of this project (reference (10)). Resultingly, the surrounding areas have higher-risk air quality metrics. Since the St. Cloud area of Stearns County is the primary area of concern regarding air quality, a further evaluation of available air quality data in that region follows.

In Minnesota, air quality is monitored using stations located throughout the state. The MPCA uses data from these monitoring stations to calculate the Air Quality Index (AQI) on an hourly basis for ozone, particulate matter 2.5 microns or less in diameter ($PM_{2.5}$), sulfur dioxide, nitrogen dioxide, and carbon monoxide (reference (24)). Each day is categorized based on the pollutant with the highest AQI value for a particular hour. The monitoring station nearest to the project location is in St. Cloud, MN. This station monitors for ozone and $PM_{2.5}$. The most recent five years of available AQI data for St. Cloud is provided in Table 6.6-1.

Table 6.6-1 Air Quality Index Category by Day (St. Cloud, Minnesota)

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2021	290	66	3	2	0
2020	336	30	0	0	0
2019	313	31	0	0	0
2018	310	54	1	0	0
2017	329	36	0	0	0

Source: reference (24)

Air quality in St. Cloud has been considered good for the majority of the past five years of reported data. Only six days across all five years have been in an unhealthy category, and zero days have been in the very unhealthy category.

6.6.1.1 Impacts and Mitigation

Potential impacts to air quality and associated mitigation measures are discussed collectively here across all Project Components. Construction of the Project will result in intermittent and temporary emissions of criteria pollutants. These emissions generally include dust generated from soil disturbing activities, such as earthmoving and wind erosion associated with right-of-way clearing and construction, combustion emissions from construction machinery engines, and indirect emissions attributable to construction workers commuting to and from work sites during construction. These emissions would be dependent upon weather conditions, the amount of equipment at any specific location, and the period of operation required for construction at that location. Air pollutants from the construction equipment will be limited to the immediate vicinity of the construction area and will be temporary. Therefore, it is not anticipated that construction activities will independently cause or significantly contribute to an emission level that alters the air pollution score or attainment status for any of the NAAQS.

The amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and road surface characteristics. Emissions would be greater during dry periods and in areas where fine-textured soils are subject to surface activity. If construction activities generate problematic dust levels, the Applicants may employ construction-related practices to control fugitive dust such as application of water or other commercially available dust control agents on unpaved areas subject to frequent vehicle traffic, reducing the speed of vehicular traffic on unpaved roads, and covering open-bodied haul trucks.

During operation of the line, air emissions would be minimal. A small amount of ozone is created due to corona from the operation of transmission lines (reference (25)). A corona signifies a loss of electricity, so the Applicants have engineered the transmission lines to limit corona. The production rate of ozone due to corona discharges decreases with humidity and less significantly with temperature. Rain causes an increase in ozone production, but also accelerates the decay of ozone.

Ozone production by HVTLs is not detectable during fair weather above ambient conditions. Ozone production under wet-weather conditions is detectable with special efforts but is still considered insignificant.

Design of the transmission line also influences ozone production rate. The production rate decreases significantly as the conductor diameter increases and is greatly reduced for bundled conductors over single conductors. The production rate of ozone increases with applied voltage. The emission of ozone from the operation of a transmission line of the voltages proposed for the Project is not anticipated to have a significant impact on the environment.

6.6.2 Greenhouse Gas Emissions and Climate Change

6.6.2.1 Greenhouse Gas Emissions

Some of the most abundant gases in the atmosphere are known as greenhouse gases (GHGs). The most common GHGs include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases. The concentration of GHGs in the atmosphere has a direct relationship to global warming or climate change. GHGs are known to trap heat in Earth's atmosphere by absorbing light energy and emitting a portion of released energy back towards Earth (reference (26)). Trapped heat in the atmosphere creates a warming effect known as the Greenhouse Gas effect, in which the temperatures of Earth's atmosphere rise as more GHGs are added to the atmosphere. This drives further changes to the climate affecting precipitation, flooding, and storms (reference (27)).

The amount of energy absorbed by 1 ton of a GHG over a given period is known as the Global Warming Potential (GWP). The order of common GHGs by GWP from lowest to highest is CO_2, CH_4, N_2O, and fluorinated gases (reference (26)). For ease of comparison, GWPs are calculated relative to the energy absorption of 1 ton of CO_2. Emission of a given GHG is normalized using the GWP; the resultant value is referred to as carbon dioxide equivalent (CO_2e).

During construction and operation of the Project, small amounts of GHGs will be generated. GHG emissions from this Project will be largely from the combustion of fossil fuels such as gasoline and diesel. GHGs associated with fuel combustion are CO_2, CH_4, and N_2O. The largest source of GHG emissions from the project will be from the temporary combustion of fossil fuels in construction equipment and heavy

machinery. There will be two construction efforts for the Project: construction of the Big Oaks Substation and Mississippi River Crossing (Greenfield Construction) and installation of the second circuit (Install Second Circuit). Greenfield construction will take place over the course of 8 weeks and Second Circuit Install will take place over 44 weeks. Both construction efforts will involve the use of various mobile combustion sources. Construction emissions will be localized to the construction area and are not anticipated to result in long-term impacts. GHG emissions resulting from Greenfield Construction are estimated to be 398 tons of CO_2e. GHG emissions from Install Second Circuit are estimated to be 1,998 tons of CO_2e. Total GHG emissions from the construction of this project are estimated to be approximately 2,396 tons of CO_2e. Table 6.6-2 provides a preliminary estimate of CO_2, CH_4, and N_2O emissions. CO_2 and CH_4 emissions were calculated using factors for diesel combustion from the South Coast Air Quality Management District (SCAQMD) (reference (28)). N_2O emissions were estimated using the EPA Center for Corporate Climate Leadership (CCCL) factor for construction/mining equipment (reference (29)). Detailed calculations are in Appendix I.

Table 6.6-2 Greenhouse Gas Emissions from Project Construction

Emission Source	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e[1] (metric tons)
Greenfield	391.53	0.02	0.02	397.67
Install Second Circuit	1,967.71	0.08	0.09	1,997.84
Total	2,359.24	0.10	0.11	2,395.50

[1] CO_2e calculated by equation A-1 of 40 CFR, Part 98.2, which states the total CO2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions. The GWP for CO2 is 1, CH4 is 25, and N2O is 298.

Most of the GHGs generated from this project will cease after construction is complete. Emissions resulting from routine operation and maintenance of the transmission line and substation will largely be from the combustion of gasoline or diesel in maintenance equipment and vehicle use. Routine maintenance is expected to occur on an annual basis and involve the use of diesel fueled, mobile combustion sources. Total annual GHG emissions expected from the routine operation and maintenance of this project are estimated to be 14 tons of CO_2e per year. Table 6.6-3 provides a preliminary estimate of CO_2, CH_4, and N_2O emissions. Emissions were calculated using factors from SCAQMD and the EPA CCCL (reference (29)). Detailed calculations are in Appendix I.

Table 6.6-3 Greenhouse Gas Emissions from Operation and Maintenance

Emission Source	CO_2 (metric tons/year)	CH_4 (metric tons/year)	N_2O (metric tons/year)	CO_2e[1] (metric tons/year)
Operation and Maintenance Activities	13.57	6.20E-04	7.08E-04	13.79

[1] CO_2e calculated by equation A-1 of 40 CFR, Part 98.2, which states the total CO_2e is equal to the GWP for each pollutant multiplied by the potential pollutant emissions. The GWP for CO_2 is 1, CH4 is 25, and N_2O is 298.

Potential emission of the fluorinated gas, sulfur hexafluoride (SF_6), is also associated with this project. SF_6 is a powerful GHG that is used in high-voltage circuit breakers in transmission systems. The use of such a substance is extremely common due to its stability and effectiveness at insulating electrical equipment. However, SF_6 emissions from high-voltage circuit breakers are minimal and not expected routinely since they are largely attributed to faulty equipment and leakage.

6.6.2.2 Climate Change

The MDNR's Minnesota Climate Explorer tool provides a summary of projected climate conditions for the state of Minnesota. For the counties where the Project is anticipated to occur (Douglas, Todd, Stearns, Sherburne, and Wright), average and maximum air temperature is anticipated to increase by approximately 4 degrees Fahrenheit (°F) by mid-21st century under both a high and low warming scenario, and by 6°F and 10°F by the end of the 21st century under low and high warming scenarios, respectively. Minimum air temperatures are projected to increase by approximately 3°F by mid-century under both scenarios and 6°F and 11°F for end of century under low and high warming scenarios, respectively (reference (30)).

Total precipitation is anticipated to increase by 0.7 inches (in) by mid-century under both the low and high warming scenarios. Furthermore, for the end of the 21st century, total precipitation is projected to increase by 1.6in and 3.9in for the low and high warming scenarios, respectively (reference (30)). The EPA Climate Resilience Evaluation and Awareness Tool anticipates an increase in 100-year storm intensity of 2.6 to 14 percent in 2035 and 5 to 27 percent in 2060 for the Project area (reference (31)). The EPA Streamflow Projections Map anticipates a change in average streamflow of the Mississippi River in Clearwater, MN by a ratio of 1.15 (90th percentile) under wetter projections and a ratio of 0.79 (10th percentile) under drier

projections in 2071 to 2100 (RCP 8.5) compared to baseline historical flow (1976 to 2005) (reference (32)).

6.6.2.3 Impacts and Mitigation

The GHG emissions generated during construction and routine operation or maintenance activities will be minimal and have little impact on the atmospheric GHG emissions budget. Emissions from the use of high-voltage circuit breakers cannot be reliably quantified due to the lack of published emission factors. SF_6 is a highly potent GHG due to its warming properties and residence time in the atmosphere. For this reason, equipment containing SF_6 is designed to avoid atmospheric emissions of SF_6. Performing routine inspections and preventative maintenance as well as following manufacturer specifications for replacing SF_6 containing equipment can mitigate the risk of unexpected emissions associated with aging equipment.

The Applicants also analyzed the carbon reduction benefits of the Projects. MISO's analysis demonstrated the implementation of the LRTP Tranche 1 Portfolio is estimated to reduce carbon emissions by 399 million metric tons over 20 years and 677 million metric tons over 40 years of LRTP Tranche 1 project life. For LRTP2, Xcel Energy estimated that the Project will reduce CO_2 emissions by 17.8 to 22.4 million metric tons over the first 20 years that the Project is in service and by 36.1 to 49.6 million metric tons over the first 40 years that the Project is in service. Therefore, the overall Project is anticipated to help carbon reduction goals both nationally and those set by the state of Minnesota.

As mentioned, effects of climate change include increased precipitation and flooding events. The Project area is within portions of the Federal Emergency Management Administration (FEMA) 100-year and 500-year floodplains, which puts the transmission lines at an increased risk of being impacted by climate change. To reduce the potential impacts of climate change, the Project will be designed to withstand extreme weather events, including flooding to ensure electric service reliability within the Project Area.

6.6.3 Water Resources

The following sections describe water resources located within the Proposed Route.

6.6.3.1 Groundwater

Groundwater in Minnesota is divided into six aquifer provinces based on glacial geology and bedrock (reference (33)). The Proposed Route is within the East Central and Arrowhead/Shallow Bedrock Provinces (Map 14). Most of the Proposed Route is within the Central Groundwater Province which is characterized by buried sand aquifers relatively extensive surficial sand plains, part of a thick layer of sediment deposited by glaciers overlaying the bedrock. This province has a thick glacial sediment sand and gravel aquifers are common (reference (33)).

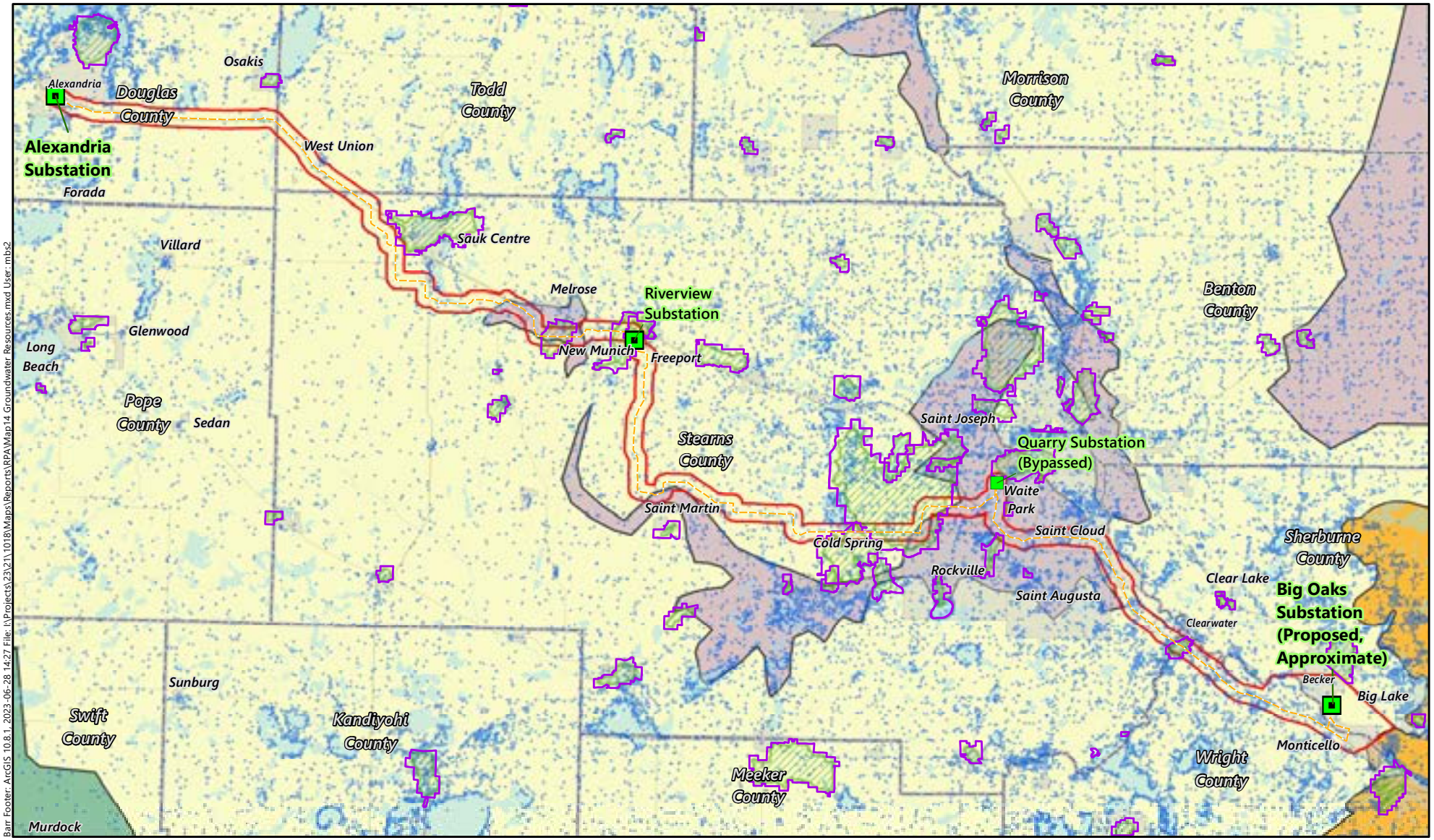
Drinking water supply management area for a surface water intake is the MDH endorsed surface and subsurface area surrounding a public water supply intake that contains the scientifically calculated surface water protection area and is managed by the entity identified in a surface water protection plan.

6.6.3.1.1 Karst

A karst feature is characterized as a location underlain by limestone that has been eroded by dissolution, producing caves, fissures, or sinkholes. According to the MDNR Karst Feature Inventory, there are no karst features located within the Proposed Route. The nearest karst feature is approximately 22 miles east of the Proposed Route near Elk River, Minnesota.

6.6.3.1.2 Impacts and Mitigation

The construction and operation of the Project is not anticipated to adversely impact groundwater resources. The Applicants will conduct geotechnical analyses where appropriate to evaluate whether karst areas are present at structure locations and structure foundation design will account for the presence of karst and the potential for dewatering, as needed. Neither a dewatering permit nor water appropriations permit are anticipated to be required during construction. If geotechnical analyses determine that temporary dewatering or water appropriations would be required, the Applicants will coordinate with the MDNR to obtain the necessary permits.



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- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Municipal Boundary
- County Boundary
- Groundwater Well*
- Wellhead Protection Area
- Drinking Water Supply Management Area

Groundwater Provinces of Minnesota

- East-central
- Central
- Western
- Arrowhead-shallow bedrock

** Only active wells classified as domestic, multiple dwellings, commercial, or industrial are shown.*

Miles

8 0 8

Data Sources: Minnesota Geological Survey, Minnesota Department of Health

Map 14

GROUNDWATER RESOURCES

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

6.6.3.2 Waterbodies and Watercourses

6.6.3.2.1 Watersheds

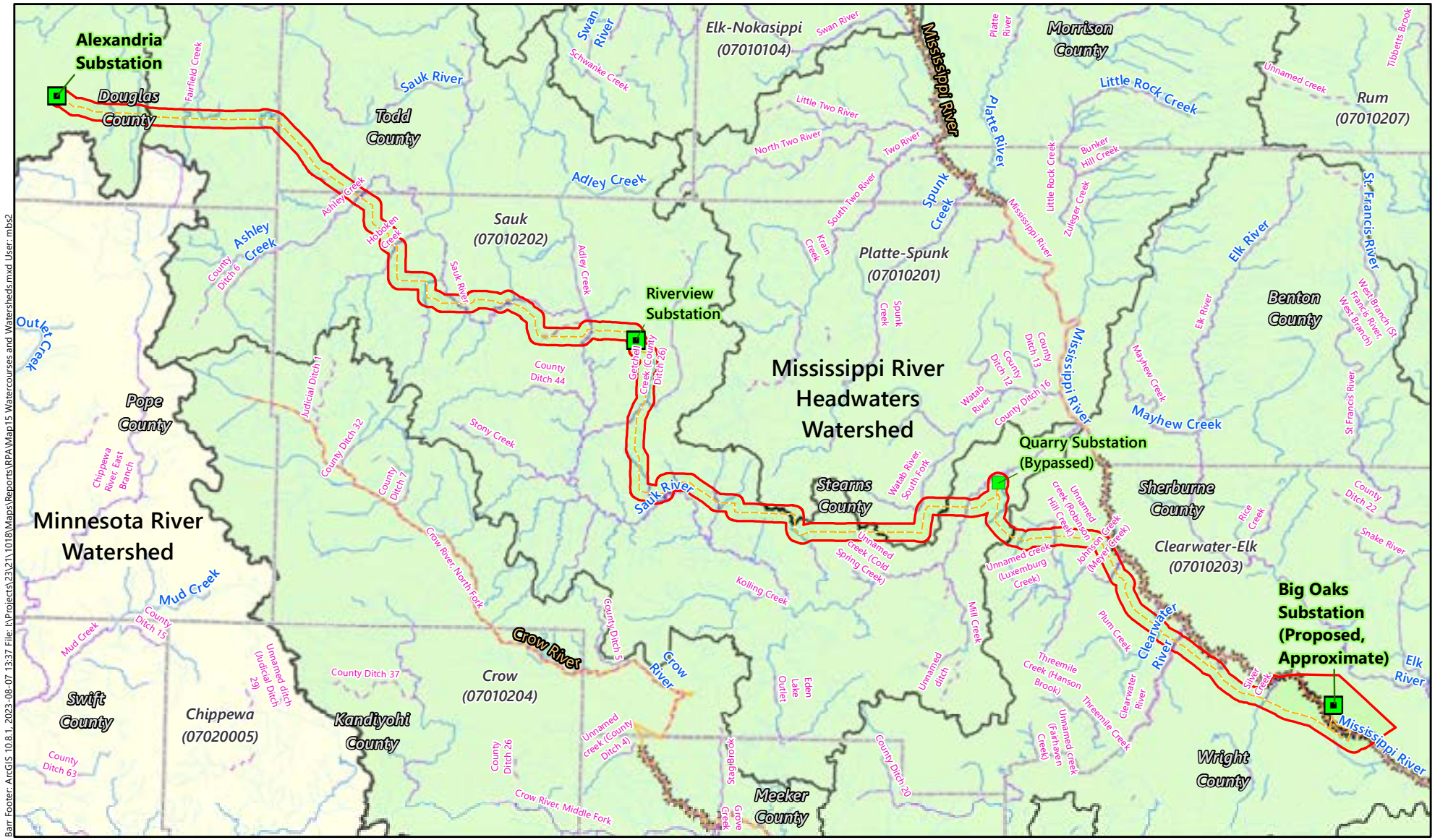
There are eight major watershed basins (HUC-04) and 81 major surface water watersheds (HUC-08) covering Minnesota. The Proposed Route is in the Mississippi Headwaters major watershed (HUC-4; 0701). There are four HUC-8 sub watersheds located within the Proposed Route (Map 15); The Platte-Spunk (07010201), Sauk (07010202), Long Prairie (07010106), and Clearwater Elk (07010203) watersheds.

6.6.3.2.2 Minnesota Public Waters

The MDNR designates public waterbodies and watercourses that meet the criteria set forth in Minn. Stat. § 103g.005, subdivision 15. According to the MDNR Public Waters Inventory (PWI) dataset, there are 40 PWI watercourses within the Proposed Route including six public ditches and 22 public watercourses (Table 6.6-4). These PWI waterbodies and watercourses are regulated by the MDNR and have a minimum 50-foot perennial vegetative buffer requirement. The public ditches are also regulated by the MDNR and have a 16.5-foot designated buffer requirement. Based on the PWI, there are 15 PWI basins located within the Proposed Route (Table 6.6-4). Locations of the PWI watercourses, and public ditches are displayed in Map 15.

Table 6.6-4 Public Waters Located within the Proposed Route

PWI Type	Length or Area in Proposed Route
Public Water Watercourse	6.4 miles
Public Ditch/Altered Natural Watercourse	0.3 miles
Public Water Basin	16.6 acre
Public Water Wetland	28.2 acres



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- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Watershed Boundary (USGS, HUC-8)

Watershed Boundary (USGS, HUC-4)

- Minnesota River
- Mississippi River Headwaters

- Watercourse (USGS)
- Impaired Stream (2022)
- Wild and Scenic River
- Public Waters Inventory Watercourse (MDNR)
- XXXXX Outstanding Resource Value Waters
- County Boundary

Miles

8 0 8

Data Sources: Minnesota Dept. of Natural Resources, U.S. Geological Survey, Minnesota Pollution Control Agency

Map 15

WATERCOURSES AND WATERSHEDS

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

6.6.3.2.3 Wetlands

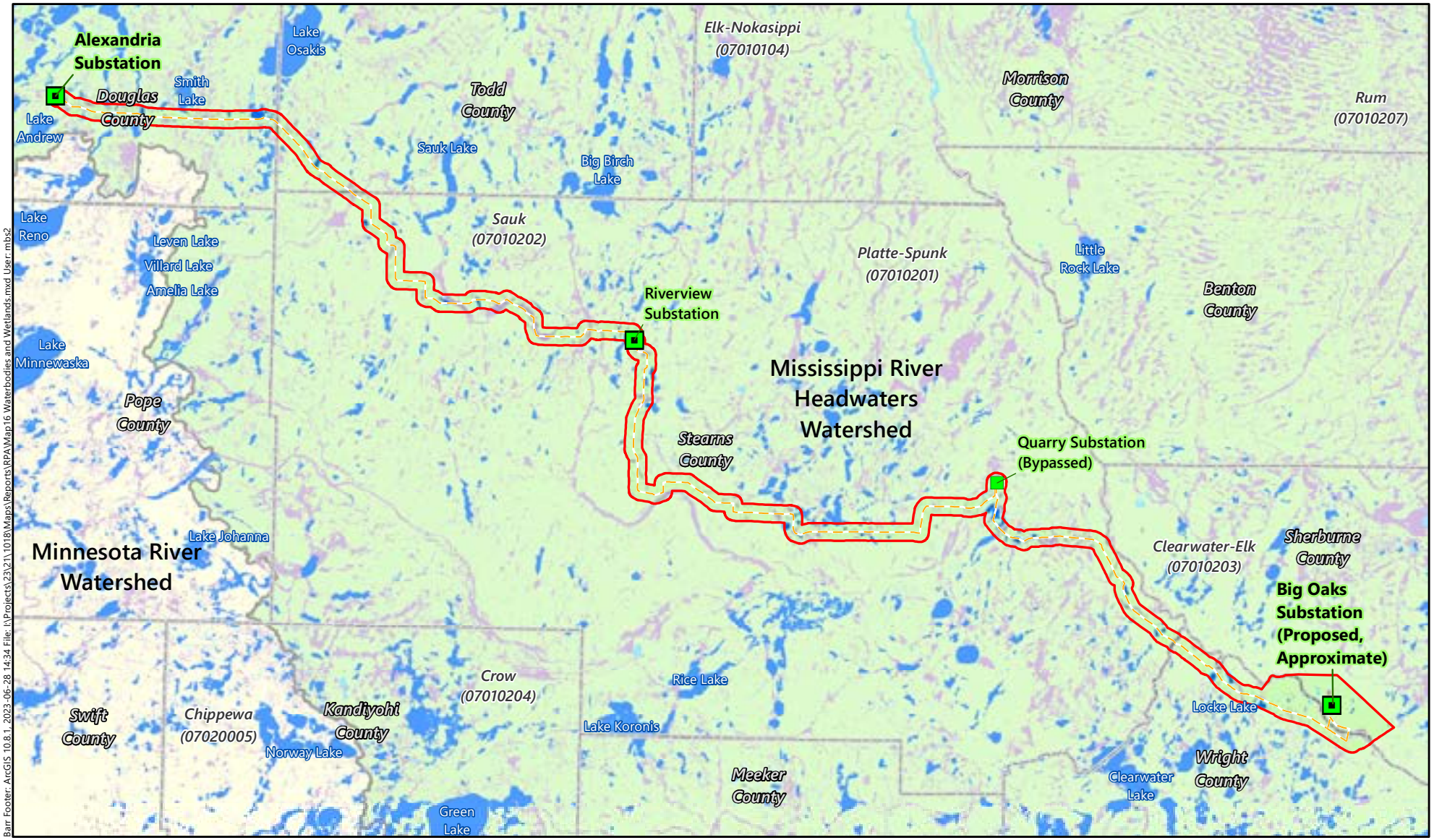
The Proposed Route is within the Midwest and Northcentral Northeast regions according to the U.S. Army Corps of Engineers' (USACE's) regional wetland designations. These regions are characterized by its generally flat to rolling topography, fertile soils, and moderate to abundant rainfall (reference (34)). Wetlands in these regions are generally characterized as prairie wetlands or riverine wetlands.

According to the USFWS National Wetlands Inventory (NWI) database, the Proposed Route contains approximately 666 acres of wetlands, comprising approximately 0.1 percent of the Proposed Route (Map 16). The majority of the wetlands are classified as shallow open water wetlands, seasonally flooded wetlands, or shallow marshes (Table 6.6-5).

Table 6.6-5 National Wetlands Inventory wetlands located within the Proposed Route

Cowardin Class.[1]	Circular 39 Class.[2]	Wetland Type	Acres in Proposed Route
PEMA, PUS, PFOA	1	Seasonally Flooded Wetlands	295.7
PEMB, PSSB	2	Wet Meadows (including Calcareous Fens)	10.2
PEMC and F, PSSH, PUBA and C	3	Shallow Marshes	69.1
L2ABF, L2EMF and G, L2US, PABF and G, PEMG and H, PUBB and F	4	Deep Marshes	1.9
L1; L2ABG and H; L2EMA, B, and H; L2RS; L2UB; PABH; PUBG and H	5	Shallow Open Water	17.0
PSSA, C, F, and G; PSS1, 5, and 6B	6	Shrub Swamp	33.7
PFO1, 5, and 6B; PFOC and F	7	Wooded Swamp	3.2
PF02, 4, and 7B; PSS2, 3, 4, and 7B	8	Bogs	<0.5
Riverine	90	Riverine	235.2
		TOTAL	666

[1] reference (35)
[2] reference (36)



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- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- County Boundary
- National Wetland Inventory (USFWS)
- Waterbody (USGS NHD)
- Public Water Basin or Wetland (MDNR)

Watershed Boundary (USGS, HUC-4)

- Minnesota River
- Mississippi River Headwaters

Miles

8 0 8

Data Sources: Minnesota Dept. of Natural Resources, U.S. Geological Survey, U.S. Fish and Wildlife Service

Map 16

WATERBODIES AND WETLANDS

ALEXANDRIA TO BIG OAKS

MISO LRTP-2 Route Permit Application

6.6.3.2.4 Calcareous Fens

Calcareous fens are rare distinctive peat accumulating wetlands that depend on a constant supply of calcium and other mineral rich groundwater. This unique microenvironment can support highly diverse and unique rate plant communities. According to the MDNR's Identification List of Known Calcareous Fens, there are no known calcareous fens located within the Proposed Route (reference (37)). The nearest calcareous fen is 290 feet east of the Proposed Route in Stearns County (Map C34 of Appendix C).

6.6.3.2.5 Special Designated Watercourses

The Wild and Scenic Rivers Act of 1968 (Public Law 90-542; 16 U.S.C. 1271 et seq) established the National Wild and Scenic Rivers Systems with the purpose to preserve rivers wish outstanding natural, cultural, and recreational values. The segment of the Mississippi River that crosses the Proposed Route is designated as a Recreational River under the Wild and Scenic Rivers Act. Rivers designated as recreational rivers are readily accessible by road or railroad, may have some development along their shorelines, and may have undergone some impoundment or diversion in the past. Designation neither prohibits development nor gives the federal government control over private property. Recreation, agricultural practices, residential development, and other uses may continue. Protection of the river is provided through voluntary stewardship by landowners and river users and through regulation and programs of federal, state, local, or tribal governments.

The MDNR designates trout streams within the state of Minnesota to protect and foster the propagation of trout. There is one designated trout stream within the Proposed Route: Robinson Hill Creek (Map C56 of Appendix C). The segment of Robinson Hill Creek that crosses the Proposed Route in Section 6 Township 123 north, Range 28 west is not designated as a trout stream. Taking of fish and minnows is prohibited within Robinson Hill Creek except during the open season or under special permit issued by the MDNR Commissioner.

Impaired Waters

Clean Water Act (CWA) Section 303(d) (Impaired Waters and Total Maximum Daily Loads) requires each state to identify and prioritize waters that are impaired or in danger of becoming impaired (threatened). For these waters, states calculate and allocate pollution reduction levels necessary to meet approved water quality standards

(reference (38)). The MPCA updates this list of impaired waters every two years. There are three impaired watercourses and one impaired wetland within the Proposed Route (Table 6.6-6).

Table 6.6-6 Impaired Waters located within the Proposed Route

Type	AUID	Name	Length or Area in Proposed Route
Wetland	21-0003-00	Clifford	0.19 acres
Watercourse	07010203-510	Mississippi River	1320 feet
Watercourse	07010203-557	Silver Creek	150 feet
Watercourse	07010202-501	Sauk River	180 feet

reference (38)

6.6.3.2.6 Infested Waters

The MDNR adds a lake, river, pond, or wetland to the Infested Waters list if it: 1) contains an aquatic invasive species that could spread to other waters; or, 2) connects to a body of water where an aquatic invasive species is present. The MDNR designates a water as Infested Waters if it contains the following species:

- Eurasian watermilfoil
- Faucet snail
- New Zealand mudsnail
- Zebra mussel
- Ruffe,
- Round goby
- Spiny water flea
- Viral hemorrhagic septicemia fish disease
- White perch.

Activities within Infested Waters are regulated under Minn. R. 6216 to prevent the spread of aquatic invasive species. The current Infested Waters list was updated on

March 21, 2023, by the MDNR. Table 6.6-7 Includes a list of all designated infested waters within the Proposed Route (reference (38)).

Table 6.6-7 Infested Waters within the Proposed Route

Water Name	Infested Species	County Location along Proposed Route	Designation Date
Clearwater River from Clearwater Lake to the Mississippi River	zebra mussel	Multiple (Stearns and Wright)	2015
Clearwater River downstream of Clearwater, including 500 feet upstream into its tributaries	Eurasian watermilfoil	Wright	1999
Mississippi River,	zebra mussel	Multiple	2007

reference (38)

6.6.3.2.7 Impacts and Mitigation

Existing Transmission Line Second Circuit

Because the Project consists largely of stringing a second circuit onto existing infrastructure, there will be no permanent disturbance to waterbodies or watercourses. Temporary impacts to waterbodies may occur during site access. These impacts will be mitigated as discussed below.

The identified trout stream would not be directly impacted by the Project. The stream would be crossed using the existing transmission line structures. Construction equipment will not be required to cross the stream. Similarly, the identified calcareous fens will not be impacted by the Project. The fens are located outside of the construction right-of-way and would not be crossed by construction equipment. Temporary dewatering will not occur adjacent to the fens. The nearest new structure foundation would be installed 0.7 mile north of the fens and would not alter groundwater at the fen locations.

Substation Bypasses

The Alexandria Substation will be expanded by 2 to 4 acres to the east of the existing substation as discussed in Section 2.2. According to the NWI database there are two wetlands (0.23 acres) located within the proposed expansion area. These wetlands are classified at a seasonally flooded basin (0.01 acres) and hardwood forest wetland (0.22 acres). The Applicants will complete a field wetland delineation to confirm the

boundaries of these two wetlands and will consult with the LGU and USACE prior to construction.

According to the NWI and PWI databases there are no wetlands or watercourses that would be directly impacted by the Riverview Substation Bypass or expansion, or Quarry Substation Tap or expansion. The new structure construction and substation expansions would occur in upland locations and would not impact any wetlands or watercourses. The Applicants will use erosion control devices to prevent sedimentation into adjacent wetlands as discussed in Section 5.2.

Big Oaks Substation

The Big Oaks Substation Siting Area includes approximately 250 acres located in cultivated cropland. According to the NWI and PWI databases there are no wetlands or watercourses located within the Big Oaks Substation Siting Area. Therefore, construction of the Big Oaks Substation is not anticipated to impact any wetlands or watercourses. Please refer to the following section for BMPs that will be used to avoid disturbance to the Mississippi.

Mississippi River Crossing Options

Both options would require transmission line spanning of the Mississippi River (Map 5). None of the Mississippi River Crossing Options would require structures to be placed within the riverbed. However, the Eastern Crossing Option would require construction of two structures on an island within the river; the Western Crossing Option would be able to span the Mississippi River without structures placed midway across the waterway.

Indirect impacts to the Mississippi River could include sedimentation to the Mississippi River during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures. This could temporarily degrade water quality by causing turbidity and increased total suspended solids. These impacts will be avoided or minimized using appropriate sediment control practices and construction practices. These practices will be detailed in the NPDES permit and SWPPP that will be completed prior to the start of construction. Since this segment of the river is a recreational river segment, the NDPES permit will comply with items 23.9, 23.10 and 23.1 of the Minnesota Construction Stormwater Permit.

Once the Project is completed, there will be no significant impact on surface water quality of the Mississippi River because construction impacts will be minimized and mitigated, disturbed soil will be restored to previous conditions or better, and the amount of land area converted to an impervious surface will be limited to the expansion of the existing substations and construction of the Big Oaks Substation which would convert less than 15 acres of land to impervious surface. The Applicants are required to obtain Section 401 certification from the MPCA.

The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements and an approved AIMP (Appendix F) and VMP (Appendix G).

Watercourses will not be crossed by construction equipment unless necessary, the crossing will be permitted as appropriate, and the appropriate local state, and or federal agencies will be consulted. Where watercourses must be crossed to string new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices will help to prevent soil erosion and ensure potential fueling and lubricating of equipment will occur at a sufficient distance beyond the construction limits.

Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing setup areas will be placed within or adjacent to water resources to the extent feasible. If a terminal dead-end structure is in or adjacent to water resources, and there is no other location in that stringing section of line to pull from/to, stringing areas may need to be placed within or adjacent to water resources; this is rare and in most cases the Applicants would be able to pull through such a dead-end and avoid a setup in or adjacent to water resources. If stringing areas need to be located within a water resource, the Applicants will consult with the MDNR, USACE, and LGU to obtain the required approvals prior to the disturbance. The Applicants will avoid major disturbance of individual wetlands and drainage systems during construction to the extent feasible. This will be done by spanning wetlands and drainage systems, which will generally avoid contact with construction equipment, where possible.

The Applicants will follow standard erosion control measures identified in the MPCA's Stormwater Best Management Practices Manual, such as using silt fencing to minimize impacts to adjacent water resources. In addition, construction will be completed according to NPDES permit requirements and an approved AIMP (Appendix F) and VMP (Appendix G).

If impacts to wetlands occur, they will be minimized through construction practices. Construction crews will maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored soil.

Crews will avoid major disturbance of individual wetlands and drainage systems during construction. This will be accomplished by strategically locating new access roads and spanning wetlands and drainage systems where possible. When it is not feasible to span the wetland, construction crews will rely on several options during construction to minimize impacts:

- When possible, construction will be scheduled during frozen ground conditions;
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route);
- The structures will be assembled on upland areas before they are brought to the site for installation; and
- When construction during winter is not possible, construction mats will be used where wetlands will be impacted.

6.6.3.3 Floodplains

The Proposed Route crosses FEMA designated 100-year and 500-year floodplain areas. FEMA designated 100-Year floodplain areas are associated with major rivers along the Proposed Route such as the Mississippi River. Table 6.6-8 provides the total acres of Proposed Route located within FEMA designated floodplains.

Table 6.6-8 Acres of Floodplain within the Proposed Route

FEMA Floodplain Layer	Acres within the Proposed Route
Floodway	535.59
100 Year floodplain (Zone A and AE)	72.31
500 Year floodplain (Zone X)	50.09

6.6.3.3.1 Impacts and Mitigation

The Project may require transmission line structures be placed within FEMA-designated 100-year or 500-year floodplains. The floodplain would be temporarily disturbed from construction site access and the placement of construction access. The contractor will use BMPs to reduce impacts to the floodplain as discussed in Section 5.2. The placement of transmission line structures in floodplains is not anticipated to alter the flood storage capacity of the floodplain based on the minimal size of individual transmission line structures. In addition, the proposed structures will be designed to be capable of accommodating increased flood elevations that could result from climate change.

6.6.4 Soil Resources

Soil information for the Proposed Route was obtained from the USDA-Natural Resource Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database (reference (39)). Soils within the Proposed Route are dominated by loams and sandy loams in the uplands and clay and organic soils in the lowlands, often associated with wetlands.

The USDA-NRCS SSURGO Database identifies farmland soils based on three categories, which are subject to protection under the Farmland Protection Policy Act (FPPA). These categories include prime farmland, prime farmland when drained, and farmland of statewide importance. Prime farmland is defined by the NRCS as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Prime farmland when drained includes soils that have the potential to be prime farmland but require drainage or hydrologic alteration to achieve high productivity. Farmland of statewide importance includes soils that are nearly prime, but are not as productive due to permeability, slope, erosion potential, or some other soil property.

Approximately 25 percent (939 acres) of the Proposed Route is mapped as prime farmland, 10 percent (366 acres) is mapped as prime farmland if drained, and 12 percent (476 acres) is mapped as farmland of statewide importance.

6.6.4.1 Impacts and Mitigation

Surface soils will be disturbed by site clearing, grading, and excavation activities. With the exception of structure locations, most impacts will be temporary. Impacts on soils are dependent, to some extent, on the conditions of the soil surface at the time of construction. Construction activities that occur on wet soils tend to have longer lasting impacts, regardless of the soil type. BMPs such as matting, and use of low ground pressure equipment will be used to minimize impacts where soil disturbance is necessary in wet soil conditions.

Soil erosion may occur if surface vegetation is removed, especially on fine textured soils. Sediment and erosion control plans will be developed that specify the types of appropriate BMPs to minimize impacts. Depending on the site, BMPs may include installation of silt fence, straw bales, or ditch blocks, and/or covering bare soils with mulch, plastic sheeting, or fiber rolls to protect drainage ways and streams from sediment runoff. Construction will be completed according to NPDES permit requirements and approved AIMP (Appendix F) and VMP (Appendix G).

Some Project Components will traverse prime farmland, prime farmland if drained, and/or farmland of statewide importance, as noted in Table 6.6-9. Permanent impacts include the areas that will be taken out of production at the structure locations or footprint of the Big Oaks Substation. These Project components will contribute to a marginal increase in impervious surface area and a subsequent loss of rainwater infiltration at their locations. Temporary impacts from clearing and grading within the right-of-way or Big Oaks Substation Siting Area, such as crop damages and soil compaction, may occur during construction activities. These areas will be restored and put back into production after completion of construction activities.

Table 6.6-9 Prime Farmland, Prime Farmland if Drained, and Farmland of Statewide Importance within the Project Components

Project Feature	Prime Farmland (acres)	Prime Farmland if Drained (acres)	Farmland of Statewide Importance (acres)
Existing Transmission Line Second Circuit	496.1	281.6	390.8
Alexandria Substation Tap	2.2	0.7	1.0
Riverview Substation Bypass	7.0	1.00	0.1
Quarry Substation Bypass	0	1.5	1.3
Big Oaks Substation	0	0	2.1
Western Crossing Option	0.4	0	0
Eastern Crossing Option	3.8	0	0

Additional impacts to prime farmland may occur in order to accommodate expansion of the Alexandria and Riverview Substations.

Removal of the small amount of prime farmland, prime farmland if drained, and farmland of statewide importance is not expected to negatively affect the general farm community within the Proposed Route. Once construction is complete, agricultural production within the right-of-way will resume.

6.6.5 Vegetation

As noted in Section 6.1, the Proposed Route straddles four ECS subsections, the Minnesota River Prairie and Hardwood Hills subsections in the western two-thirds and the Anoka Sand Plain and Big Woods subsections in the eastern third (Map 6).

Pre-settlement vegetation in the Minnesota River Prairie subsection consisted primarily of tallgrass prairie and wet prairie islands. Floodplain forests were present within the riparian areas along watercourses and waterbodies (reference (2)).

In the Hardwood Hills subsection, irregular topography and presence of numerous lakes and wetlands provided a partial barrier to fire, resulting in more woodland or forest compared to the Minnesota River Prairie subsection. At pre-settlement, mixed hardwood forests were found in the eastern portion of the subsection, while tallgrass prairie was found on flatter terrain in the west (reference (2)).

Pre-settlement vegetation in the Anoka Sand Plain subsection primarily consisted of oak barrens and openings. Upland prairie and floodplain forest formed a narrow band along the Mississippi River, while a large portion of the sandplain was primarily brushland (reference (2)).

Pre-settlement vegetation in the Big Woods subsection was dominated by oak woodlands and maple-basswood forests. Aspen forests were common along the western edge of the subsection, along with bur oak forests (reference (2)).

As discussed in Section 6.2, the current landscape across the Proposed Route is dominated by agricultural land (Map 7), with corn and soybeans representing the most common crops. Natural vegetation is present in wetlands and the forested areas near waterbodies and watercourses. In addition, areas of native vegetation are found scattered throughout the Proposed Route in lands mapped or managed by the MDNR; these include Sites of Biodiversity Significance (SBS) and native plant communities (Map 17). No Scientific and Natural Areas are located within one mile of the Proposed Route. Federal and state lands that are managed for wildlife also contain natural vegetation; these are discussed below in Section 6.6.5.

The Proposed Route traverses several SBS, including 11 SBS ranked moderate and 2 ranked high with regards to biodiversity significance (Map 17). Areas with moderate biodiversity ranks contain significant occurrences of rare species and/or moderately disturbed native plant communities and landscapes that have a strong potential for recovery. Areas with high biodiversity ranks contain sites with high quality occurrences of the rarest plant communities and/or important functional landscapes.

The MDNR identifies 11 native plant community types in 19 locations within the Proposed Route, several of which are located within the SBSs (Map 17). Each native plant community is assigned a state conservation status as follows:

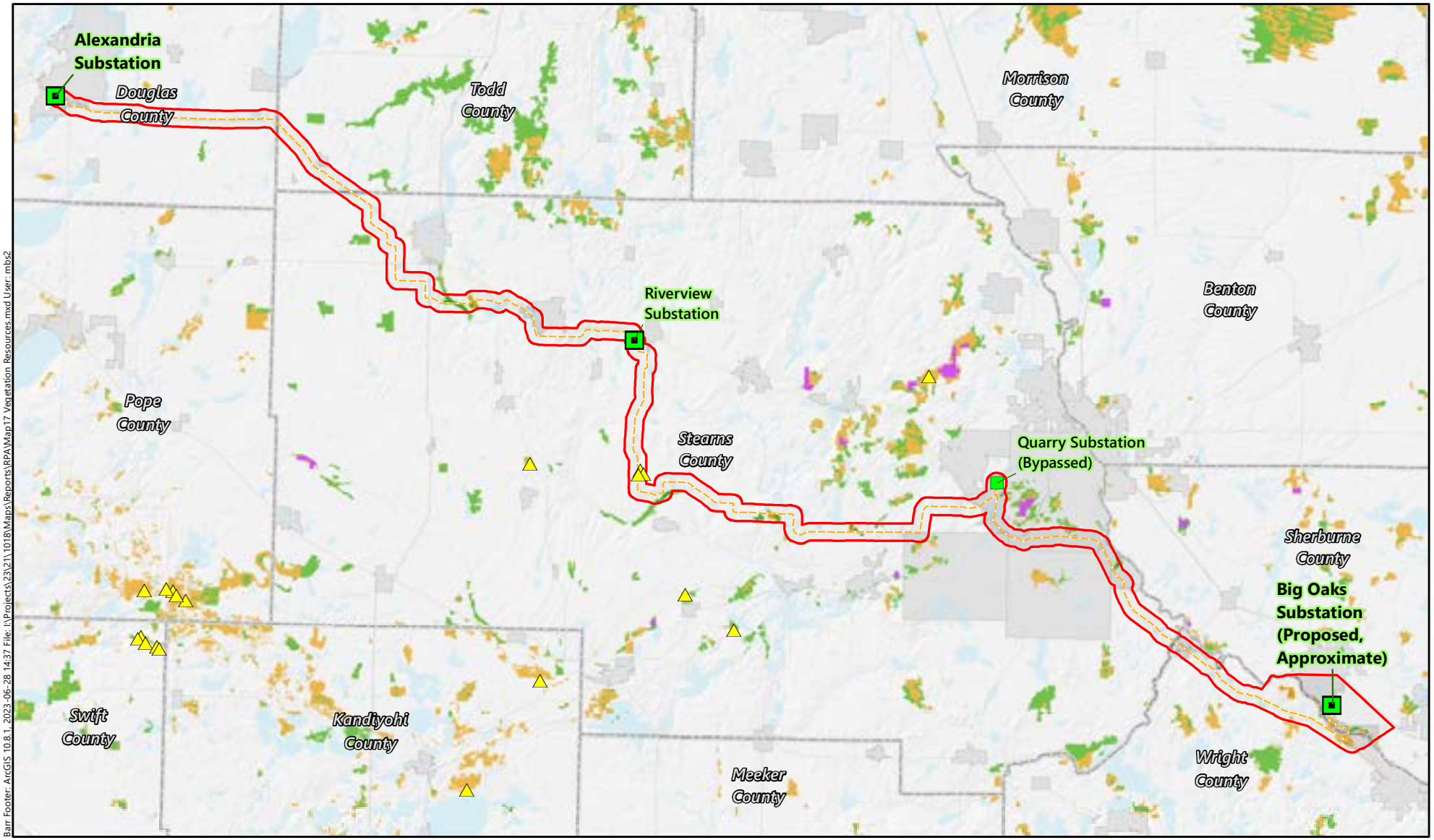
- S1 – community is critically imperiled
- S2 – community is imperiled
- S3 – community is vulnerable to extirpation or extinction
- S4 – community is apparently secure

- S5 – community is demonstrably widespread, abundant, and secure

Native plant community types mapped within the Proposed Route include the following:

- Southern Dry-Mesic Oak (Maple) Woodland (FDs37; conservation status S3, S4)
- Pin Oak – Bur Oak Woodland (FDs37b; conservation status S3)
- Southern Terrace Forest (FFs59; conservation status S1, S2, S3)
- Elm – Ash – Basswood Terrace Forest (FFs59c; conservation status S2)
- Silver Maple – (Virginia Creeper) Floodplain Forest (FFS68a; conservation status S3)
- Tamarack Swamp (Southern) (FPs63a; conservation status S2, S3)
- Basswood – Bur Oak – (Green Ash) Forest (MHs38b; conservation status S3)
- Red Oak – Sugar maple – Basswood – (Bitternut Hickory) Forest (MHs38c; conservation status S3)
- Dry Sand – Gravel Prairie (Southern) (UPs13b; conservation status S2)
- Dry Sand – Gravel Oak Savanna (Southern) (UPs14b; conservation status S1, S2)
- Willow – Dogwood Shrub Swamp (WMn82a; conservation status S5)

In addition, the Applicants, in collaboration with several state and local agencies and institutions, has restored and is continuing to manage several acres of oak savanna forest within the Proposed Route, near the Mississippi River Crossing Options and the Monticello nuclear plant (Map 17).



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Project Study Area
Anticipated Alignment
Project Substation
Bypassed Substation
Municipal Boundary
County Boundary

Calcareous Fen Location
Scientific and Natural Area
Native Plant Community
Site of Biodiversity Significance*

** Excludes sites with significance ranked 'below'*

Miles
8 0 8

Data Source:
Minnesota Dept. of Natural Resources

Map 17

VEGETATION RESOURCES
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application

6.6.5.1 Impacts and Mitigation

Potential impacts to vegetation within the Proposed Route will occur where clearing of trees and other vegetation is necessary for Project construction, maintenance, and safe operation of the transmission line. Permanent removal of vegetation will occur in areas where new structures are proposed. Each structure will result in a permanent loss of approximately 115 square feet of vegetation cover.

Construction and maintenance activities also have the potential to result in the introduction or spread of noxious weeds. Noxious weeds, which are regulated under Minn. Stat. § 18, can be introduced to new areas through propagating material like roots or seeds transported by contaminated construction equipment. Disturbed soil surfaces have the potential to allow noxious weeds to establish and out-compete existing vegetation, whether native or cropland.

The Applicants will work with the state and counties crossed by the Proposed Route to identify locations where noxious weeds may be present and will develop appropriate BMPs to minimize impacts across all Project Components.

Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with an approved seed mix that is certified to be free of noxious weeds. Construction, restoration, and maintenance activities will be completed according to an approved AIMP (Appendix F) and VMP (Appendix G).

6.6.5.1.1 Existing Transmission Line Second Circuit

Where the second circuit will be strung along existing infrastructure, impacts to vegetation are anticipated to be minimal and/or temporary in nature. While the existing right-of-way primarily crosses through agricultural land, it also crosses six SBS with moderate biodiversity significance ranks and four native plant communities with a conservation status of S2 and S3 (Map 17 and Appendix C). The integrity of these SBS and native plant communities has already been altered from the construction and maintenance of the existing infrastructure. As such, impacts due to construction of the second circuit are not anticipated to substantially further disrupt vegetative community quality or function within the existing right-of-way, as this area is continually impacted by maintenance activities.

Permanent impacts to vegetation will occur in areas where up to 60 new structures are proposed in the existing infrastructure right-of-way to accommodate the second

circuit. Structures were placed to avoid sensitive areas to the extent feasible; however, two structures will be placed in a SBS of moderate biodiversity significance, one of which is also located in a Basswood – Bur Oak – (Green Ash) Forest native plant community (conservation status S3) (Map C21 of Appendix C). As mentioned above, SBS and native plant communities were previously altered when the existing infrastructure was constructed and as the right-of-way is routinely maintained. The permanent loss of vegetation cover from new structures will occur in this previously disturbed and routinely maintained right-of-way and not undisturbed native plant communities.

With the exception of structure placement, no other permanent changes to vegetation/land cover types will occur within the right-of-way where the second circuit will be strung.

6.6.5.1.2 Alexandria Substation Tap

The anticipated alignment into the Alexandria Substation primarily traverses agricultural and open land. However, the anticipated alignment also traverses two small forested areas, one of which is the edge of a hardwood forest where the anticipated alignment deviates from the existing infrastructure right-of-way and the other is a windrow just east of the Alexandria Substation (Map 17 and Map C1 of Appendix C). The anticipated alignment and associated right-of-way avoid SBS and native plant communities.

Permanent impacts to vegetation will occur during construction and maintenance where trees and other vegetation will be cleared within the right-of-way. This alignment will require permanently clearing a few trees where the anticipated alignment deviates from the existing infrastructure and crosses through a windrow just east of the Alexandria Substation (Map 17 and Map C1 of Appendix C). Temporary and permanent impacts to agricultural land are discussed in Section 6.4.1. The anticipated alignment will require one new structure, which will result in a permanent loss of vegetation cover. Additional impacts to vegetation may occur in order to accommodate expansion of the Alexandria Substation.

6.6.5.1.3 Riverview Substation Bypass

The anticipated alignment bypassing the Riverview Substation traverses all agricultural land and avoids SBS and native plant communities (Map 3 and Map C27 and Map C28 of Appendix C).

Temporary and permanent impacts to agricultural land are discussed in Section 6.4.1. The anticipated alignment will require three to four new structures, which will result in a permanent loss of vegetation cover. Additional impacts to vegetation may occur in order to accommodate expansion of the Riverview Substation.

6.6.5.1.4 Quarry Substation Bypass

The anticipated alignment bypassing the Quarry Substation traverses agricultural and forested land but avoids SBS and native plant communities (Map 4 and Map C52 of Appendix C). Additional impacts to vegetation may occur in order to accommodate expansion of the Quarry Substation.

Permanent impacts to vegetation will occur during construction and maintenance where trees and other vegetation will be cleared within the right-of-way. This alignment will require permanently clearing a few trees. Temporary and permanent impacts to agricultural land are discussed in Section 6.4.1. The anticipated alignment will require four to six new structures, which will result in a permanent loss of vegetation cover.

6.6.5.1.5 Big Oaks Substation

As noted in Section 6.2, the Big Oaks Substation siting area is dominated by agricultural landcover, with open forest vegetation cover in the southern extent of the siting area (Map C70 of Appendix C). The Big Oaks Substation was sited to avoid the South Becker 13 SBS (ranked high) and a Southern Dry-Mesic Oak (Maple) Woodland native plant community (conservation status S3, S4), which border the siting area to the southwest.

Construction of the Big Oaks Substation will result in the permanent removal of 10 acres of vegetation. With the exception of the transmission line alignment that will traverse the substation siting area from one of the options for crossing the Mississippi River, the substation will be sited to avoid natural vegetation to the extent feasible and

will likely be located on agricultural land. Potential impacts to agricultural areas are discussed in Section 6.4.1.

6.6.5.1.6 Mississippi River Crossing Options

Both options for crossing the Mississippi River to connect to the Big Oaks Substation are located in an area dominated by natural vegetation, including several SBS and native plant communities (Map C70 of Appendix C). Permanent impacts to vegetation associated with each option will occur during construction and maintenance where trees and other vegetation will be cleared within the right-of-way. In addition, both options will require new structures, which will result in a permanent loss of vegetation cover. The Applicants will work with the MDNR and other appropriate agencies to avoid or minimize impacts on sensitive vegetation, such as SBS and native plant communities and areas preserved or managed for wildlife (Section 6.6.5). When these areas cannot feasibly be spanned, the Applicants will work to minimize the number of permanent structures within the area.

The anticipated alignment for the Western Crossing Option will require a new corridor through the Monticello Savanna SBS (ranked high) and associated Pin Oak – Bur Oak Woodland native plant community (conservation status S3) and the South Becker 18 SBS (ranked moderate) and associated Southern Dry – Mesic Oak (Maple) Woodland native plant community (conservation status S3) (Map C70 of Appendix C). Although permanent tree clearing will be required within the anticipated right-of-way that traverses these native plant communities, the tree cover is relatively sparse in this area. Clearing of other vegetation would occur where structure placement is necessary.

Before crossing the Mississippi River, the anticipated alignment for the Eastern Crossing Option follows existing infrastructure through the edge of the Monticello Savanna SBS (ranked high) and two native plant community types, Pin Oak – Bur Oak Woodland (conservation status S3) and Dry Sand – Gravel Prairie (Southern) (conservation status S2) (Map 5 and Map C70 of Appendix C). As noted above, the integrity of SBS and native plant communities in the existing infrastructure right-of-way have already been altered. As such, additional impacts where the Eastern Crossing Option follows existing infrastructure are not anticipated to substantially disrupt vegetative community quality or function.

Where the anticipated alignment for the Eastern Crossing Option deviates from the existing infrastructure, it traverses the edge of a Pin Oak – Bur Oak Woodland native plant community (conservation status S3) along a road corridor and then cuts a new corridor through an island in the Mississippi River, which is a Silver Maple – Virginia Creeper Floodplain Forest native plant community (conservation status S3) and also part of the Monticello Savanna SBS (ranked high) (Map C70 of Appendix C). This native plant community is densely forested and too large to span. As such, all trees will need to be permanently cleared in the anticipated right-of way and two structures will be placed within the native plant community. The Applicants have not identified the exact location of these structures as engineering and design work has not occurred. As noted in Section 6.6.7.2.1 and 7.1.2, the state endangered butternut tree (Juglans cinerea) could be present within the anticipated right-of-way for the Eastern Crossing Option.

The Eastern Crossing Option continues north across the Mississippi River into the South Becker 20 SBS (ranked moderate), paralleling an existing transmission line (Map C70 of Appendix C). No native plant communities have been mapped within this SBS; however, the vegetation consists of a sparsely forested community, and will therefore require additional tree clearing in the anticipated right-of-way. The remainder of the Eastern Crossing Option's anticipated alignment parallels several existing transmission lines through the edge of the South Becker 18 SBS (ranked moderate) and associated Southern Dry – Mesic Oak (Maple) Woodland native plant community (conservation status S3, S4) before entering into the Big Oak Substation siting area (Map C70 of Appendix C). Additional tree clearing may be necessary in this area to expand the transmission line corridor.

6.6.6 Wildlife

The Proposed Route's agricultural landscape, combined with the natural habitats associated with wetlands, the Mississippi River, preserved or managed wildlife lands, and SBS and native plant communities (discussed above under Section 6.6.4), provide habitat for a diversity of resident and migratory wildlife species. These species include large and small mammals, songbirds, waterfowl, raptors, fish, reptiles, mussels, and insects. These species use the area for forage, shelter, breeding, or as stopover during migration.

Several lands that are preserved or managed for wildlife and associated habitat are scattered throughout the geographic area. The preserved or managed wildlife lands within the Proposed Route include: the Lake Osakis and Avon Hills National Audubon Society Important Bird Areas (IBA), several USFWS Grassland Bird Conservation Areas (GBCA), the USFWS Douglas and Stearns County WPAs, and the MDNR Sauk River WMA (Map 18).

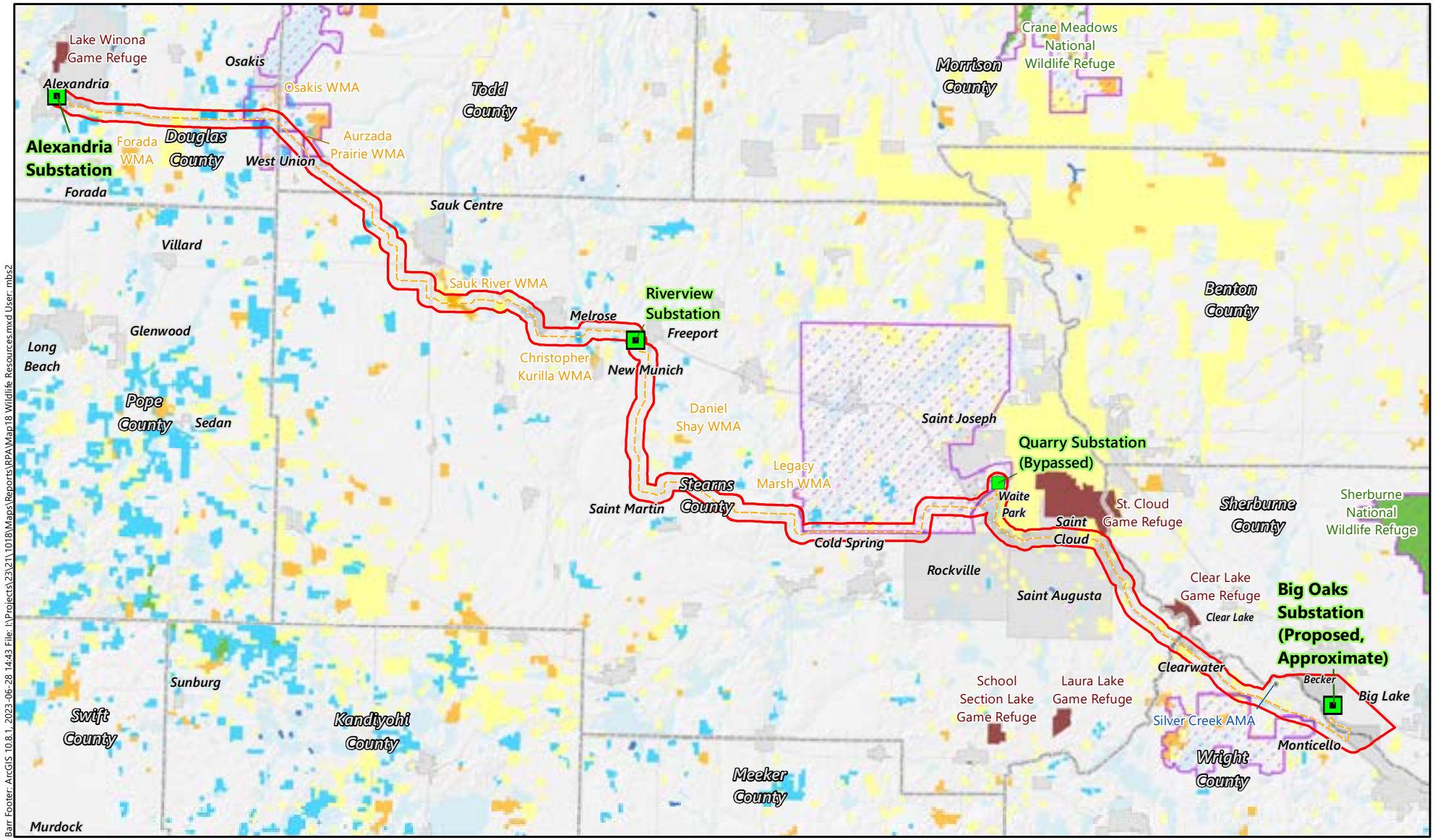
The National Audubon Society works to identify, monitor, and protect habitat for bird species throughout the U.S., in part by designating sites as IBAs. IBAs are designated when they meet certain criteria, including providing habitat for at least one of the following:

- Species of conservation concern (e.g., threatened and endangered species);
- Range-restricted species (species vulnerable because they are not widely distributed);
- Species that are vulnerable because their populations are concentrated in one general habitat type or biome; and/or
- Species, or groups of similar species (such as waterfowl or shorebirds), that are vulnerable because they occur at high densities due to their congregatory behavior.

The USFWS designates GBCAs as priority areas for grassland protection and enhancement that are thought to provide suitable habitat for many or all priority grassland bird species in tall grass prairie.

The USFWS has conserved more than 3 million acres as WPAs. WPAs are small natural wetlands and grasslands that provide breeding, resting, and nesting habitat for waterfowl, shorebirds, grassland birds and other wildlife.

The MDNR manages over a million acres of land as WMAs intended to protect wildlife habitat, provide hunting opportunities, and recreational activities, including wildlife viewing.



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- Project Study Area
- Anticipated Alignment
- Project Substation
- Bypassed Substation
- Municipal Boundary
- County Boundary
- Important Bird Area (Audubon Society)
- State Wildlife Management Area (MDNR)
- Aquatic Management Area (MDNR)
- State Game Refuge (MDNR)
- National Wildlife Refuge (USFWS)
- Waterfowl Production Area (USFWS)
- Grassland Bird Conservation Area (Core Areas, USFWS)

Miles
8 0 8

Data Sources: Minnesota Dept. of Natural Resources, Audubon Society, US Fish and Wildlife Service

Map 18

WILDLIFE RESOURCES
ALEXANDRIA TO BIG OAKS
MISO LRTP-2 Route Permit Application

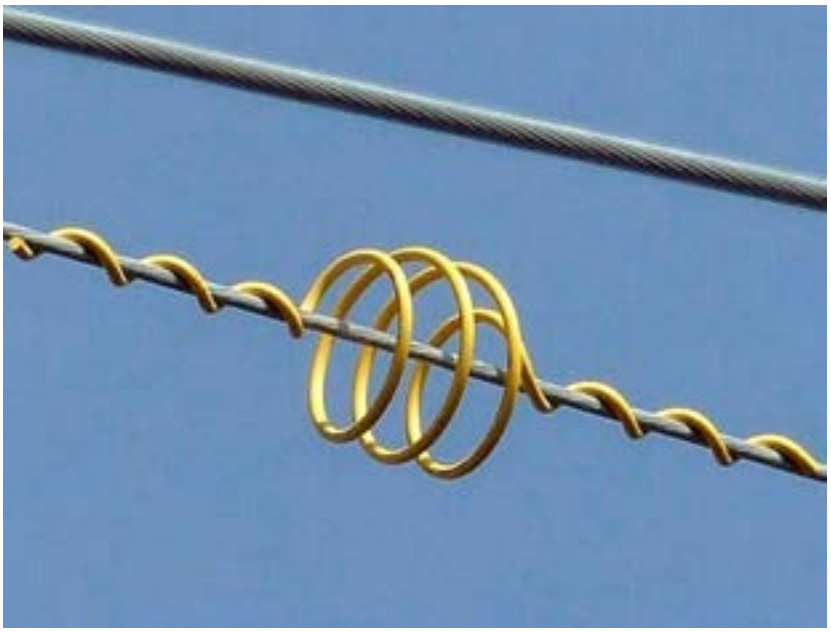
6.6.6.1 Impacts and Mitigation

Potential temporary impacts to wildlife within the Proposed Route may occur during Project construction as a result of increased noise, dust, and human activity, which could cause some species to temporarily abandon habitat. The majority of common wildlife species are mobile and can avoid impacts from noise by leaving the affected area for similar habitat adjacent to the Proposed Route. Less mobile wildlife species, such as small mammals, amphibians, reptiles, and nesting birds may be susceptible to mortality from vehicles and other equipment moving within the right-of-way.

The creation of new transmission line corridors can result in permanent habitat loss, conversion, and/or fragmentation as a result of clearing vegetation for construction and maintenance. Permanent removal of potential habitat will occur in areas where new structures are proposed. Each structure will result in a permanent loss of approximately 115 square feet of potential habitat.

Once the Project is operational, there is potential for avian and transmission line interactions in the form of collisions. Waterfowl are more susceptible to transmission line collisions, especially if the transmission line is placed between agricultural fields that serve as feeding areas, and wetlands or open water which serve as resting areas. In these areas, it is likely that waterfowl and other birds will travel between different habitats, potentially increasing the likelihood of avian conflicts with the transmission line. To minimize these potential impacts on birds, the Project will be constructed according to Avian Power Line Interaction Committee (APLIC) recommended safety standards to reduce the potential for avian collisions. These APLIC safety standards will include the use of bird flight diverters (Figure 6.6-1) in certain locations where the risk of collision is high.

Figure 6.6-1 Bird Flight Diverter Example



6.6.6.1.1 Existing Transmission Line Second Circuit

Where the second circuit will be strung along existing infrastructure, impacts to wildlife are anticipated to be minimal and/or temporary in nature. Wildlife inhabiting this area are already accustomed to disturbance from routine maintenance activities within the existing right-of-way. In addition, the existing infrastructure already poses a threat to avian collisions; as such, the second circuit is not anticipated to pose a significantly increased threat.

The existing infrastructure right-of-way intersects the Douglas and Stearns County WPAs, the Sauk River WMA, the Lake Osakis and Avon Hills IBAs and 12 GBCAs (Map 18 and Appendix C). The integrity of these preserved or managed wildlife lands has already been altered from the construction and maintenance of the existing infrastructure. As such, impacts due to construction of the second circuit without new infrastructure proposed within these areas are not anticipated to further alter the quality of these habitats.

Permanent loss of potential wildlife habitat will occur in areas where up to 60 new structures are proposed within the existing infrastructure right-of-way to accommodate the second circuit. Preserved or managed wildlife lands were spanned to the extent feasible; however, the Avon Hills IBA is too large to span and will

require the placement of three new structures within it (Map C47 to Map C49 and Map C51 to Map C52 of Appendix C).

With the exception of structure placement, no other permanent changes to wildlife habitat are anticipated to occur within the right-of-way where the second circuit will be strung.

6.6.6.1.2 Alexandria Substation Tap

The area around the Alexandria Substation is disturbed from the presence of the substation, transmission lines, and I-94. Available wildlife habitat in the area includes agricultural/open, forested, wetland, and lake habitat; no preserved or managed wildlife lands are present in the vicinity of the substation (Map 18 and Map C1 of Appendix C). As discussed in Section 6.6.4, the anticipated alignment and associated right-of-way into the Alexandria Substation traverses some forested habitat; this habitat will be permanently converted into open right-of-way habitat. One new structure will be required for this alignment, which will result in a permanent loss of potential wildlife habitat. Additional impacts to wildlife habitat may occur in order to accommodate expansion of the Alexandria Substation.

6.6.6.1.3 Riverview Substation Bypass

The area around the Riverview Substation is disturbed from the presence of the substation, transmission lines, and roads. The only habitat available for wildlife is agricultural land; no preserved or managed wildlife lands are present in the vicinity of the substation (Map 18 and Map C27 and Map C28 of Appendix C). The anticipated alignment bypassing the Riverview Substation traverses agricultural land and would not result in any habitat conversion. Between three and five new structures will be required for this alignment, which will result in a permanent loss of potential habitat. Additional impacts to wildlife habitat may occur in order to accommodate expansion of the Riverview Substation.

6.6.6.1.4 Quarry Substation Bypass

The area around the Quarry Substation is disturbed from the presence of the substation, transmission lines, and CSAH 138 (Map 4 and Map C52 of Appendix C). Available wildlife habitat in the area includes agricultural/open and forested habitats. In addition, the Avon Hills IBA intersects the Quarry Substation area and several GBCAs are adjacent to the Proposed Route in this area (Map 18 and Map C52 of

Appendix C). Although the anticipated alignment is within the IBA, new impacts to bird species are expected to be minimal given that the area already contains several existing transmission lines adjacent to the anticipated alignment. However, the anticipated alignment will require up to three new structures within the Avon Hills IBA.

As discussed in Section 6.6.4, the anticipated alignment and associated right-of-way into the Quarry Substation traverses some forested habitat; this habitat will be permanently converted into open right-of-way habitat. Between four and six new structures will be required for this alignment, which will result in a permanent loss of potential habitat. Additional impacts to wildlife habitat may occur in order to accommodate expansion of the Quarry Substation.

6.6.6.1.5 Big Oaks Substation

The Big Oaks Substation siting area primarily contains agricultural habitat, with open forest habitat also present in the southern part. No preserved or managed wildlife lands are present in the siting area (Map 18 and Map C70 of Appendix C).

The substation will be sited to avoid natural vegetation to the extent feasible and will likely be located on agricultural land. As such, construction of the Big Oaks Substation will result in the permanent removal of 10 acres of agricultural habitat. Extensive similar agricultural habitat is present adjacent to the siting area. As discussed in Section 6.6.5.1.5, the South Becker 13 SBS (ranked high) and a Southern Dry-Mesic Oak (Maple) Woodland native plant community border the southwest part of the siting area; these areas also provide wildlife habitat.

6.6.6.1.6 Mississippi River Crossing Options

Both options for crossing the Mississippi River to connect to the Big Oaks Substation are located in an area of high-quality wildlife habitat due to the presence of natural vegetation, including native plant communities and SBS, and the Mississippi River and islands within the river (Map 17 and Map C70 of Appendix C). As noted in Section 2.4, H-frame structures may be used for either river crossing option to allow for a greater span length across the Mississippi River. Use of H-frames would also allow all of the conductors to be strung in a single horizontal plane, therefore minimizing the vertical barrier that avian species would cross.

While the Western Crossing Option is the shortest in length, its anticipated alignment crosses the Mississippi River in an area where no existing transmission lines are present (Map C70 of Appendix C); as such, it could potentially create a new impact to birds flying through the area. The anticipated alignment for the Western Crossing Option requires fragmenting sparsely forested wildlife habitat on each side of the Mississippi River. The anticipated alignment for the Western Crossing Option requires permanent conversion of sparsely forested habitat into open right-of-way habitat. New structures will be required for the Western Crossing Option's anticipated alignment, which will result in a permanent loss of potential wildlife habitat.

Although there is an existing transmission line corridor in the vicinity of the Eastern Crossing Option's anticipated alignment, the Eastern Crossing Option is routed to avoid crossing over some of the smaller islands in the Mississippi River (Map C70 of Appendix C). As a result, where the anticipated alignment crosses the Mississippi River, it requires a new corridor, fragmenting densely forested wildlife habitat on a larger island in the Mississippi River causing permanent impacts. The anticipated alignment for the Eastern Crossing Option requires permanent conversion of densely and sparsely forested habitat into open right-of-way habitat. New structures will be required for the Eastern Crossing Option's anticipated alignment, which will result in a permanent loss of potential wildlife habitat.

6.6.7 Protected Species

Data on federal and state-protected species were reviewed for the Project using the USFWS Information for Planning and Consultation (IPaC) online tool, the MDNR Natural Heritage Inventory System (NHIS) database (License Agreement #2022-008), and MDNR Conservation Explorer online tool. Although this review does not represent a comprehensive survey, it provides information on the potential for the presence of protected species within the Proposed Route.

6.6.7.1 Federally Protected Species

Federally threatened or endangered species are protected under Section 7 of the Endangered Species Act of 1973 (ESA). Migratory birds are protected under the Migratory Bird Treaty Act of 1918 (16 USC 703-712), which prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. Bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*) are protected under the Bald and Golden Eagle Protection Act (16 USC

668-668d), which specifically prohibits the taking or possession of and commerce in, either alive or dead, or any part, nest, or egg of these eagles.

The USFWS IPaC online tool was queried on April 20, 2023, for a list of federally threatened and endangered species, proposed species, candidate species, and designated critical habitat that may be present within the Proposed Route (Appendix J). The IPaC query identified the following species as potentially occurring in the Proposed Route: northern long-eared bat (*Myotis septentrionalis*; endangered), tricolored bat (*Perimyotis subflavus*; proposed endangered), monarch butterfly (*Danaus plexippus*; candidate), and whooping crane (*Grus americana*; experimental population, non-essential). The IPaC query also identifies bald eagles and golden eagles and several migratory birds as potentially being present in the Proposed Route.

6.6.7.1.1 Northern Long-Eared Bat

The federally endangered northern long-eared bat roosts in living and dead trees greater than 3 inches in diameter that have loose or peeling bark, cavities, or crevices during the active season (reference (40)). During winter, they hibernate in caves and mines. According to the MDNR and USFWS a northern long-eared bat hibernacula is present approximately 4 miles north of the Proposed Route in Stearns and Sherburne Counties; no maternity roost trees have been identified within the Proposed Route (reference (41)). However, potentially suitable roosting and foraging habitat is present within the Proposed Route.

6.6.7.1.2 Tri-Colored Bat

Tri-colored bats, a federally proposed endangered species, are found in forested habitats where they roost in trees during the active season; tri-colored bats hibernate in caves and mines over the winter (reference (42)). Potentially suitable roosting and foraging habitat is present within the Proposed Route; however, proposed species are not protected under the ESA.

6.6.7.1.3 Monarch Butterfly

Monarch butterflies, a federal candidate species, are found in areas with a high number of flowering plants, which provide sources of nectar. Monarch butterflies rely exclusively on the presence of milkweed (*Asclepias* spp.) to complete the caterpillar life stage (reference (43)). Suitable habitat for monarch butterflies is present within the Proposed Route; however, candidate species are not protected under the ESA.

6.6.7.1.4 Whooping Crane

Whooping cranes breed, migrate, winter, and forage in a variety of wetland and other habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields (reference (44)). Whooping cranes are extremely rare in Minnesota. Currently there is only one self-sustaining wild population in North America, the Aransas-Wood Buffalo National Park population, which nests in Wood Buffalo National Park and adjacent areas in Canada, and winters in coastal marshes in Texas at Aransas.

The whooping crane is designated as a non-essential experimental population in Minnesota. This designation refers to a population that has been established within its historical range under Section 10(j) of the ESA to aid in recover of the species. Consultation under Section 7(a)(2) of the ESA is only required if project activities will occur within a National Wildlife Refuge or National Park. If project activities are proposed on lands outside of a National Wildlife Refuge or National Park, consultation is not required. The Proposed Route does not cross a National Wildlife Refuge or a National Park. The nearest location of these resources is the Sherburne National Wildlife Refuge, which is approximately 8 miles northeast of the Big Oaks Substation siting area. Although suitable habitat is present within the Proposed Route, given the highly disturbed nature of the Proposed Route and the extreme rarity of whooping cranes in Minnesota, they are not likely to be present.

6.6.7.1.5 Bald and Golden Eagles

In Minnesota, bald eagles inhabit forested areas near large lakes, reservoirs, and rivers (reference (45)). Golden eagles can be found in open country in the vicinity of hills, cliffs and bluffs associated with grasslands, intermittent forested habitat, and woodland-brushlands (reference (46)). Habitat suitable for bald and golden eagles is present within the Proposed Route.

6.6.7.1.6 Migratory Birds

The state of Minnesota is in the Central Flyway of North America. The Central Flyway is a bird migration route that encompasses the Great Plains of the U.S. and Canada. Migratory birds use portions of the Central Flyway as resting grounds during spring and fall migration, as well as breeding and nesting grounds throughout the summer. Suitable habitat for migratory birds is present throughout the Proposed Route in the extensive agricultural habitat, as well as areas of high-quality native

habitat (Section 6.6.4), including those preserved or managed for wildlife (Section 6.6.5). The IPaC query identified 20 USFWS Birds of Conservation Concern (BCC) as potentially being present in the Proposed Route (Appendix J). The USFWS identifies BCCs as species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the ESA. The Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911) affords protection to BCC.

6.6.7.1.7 Impacts and Mitigation

Potential impacts to and mitigation measures for federally protected species are discussed by species for all Project Components.

Northern Long-Eared Bat and Tri-Colored Bat

Potential impacts to northern-long eared bats may occur in areas of the Project where tree clearing will occur, such as the Alexandria Substation Tap, Quarry Substation Bypass, and the Mississippi River Crossing Options. Direct impacts to individual northern long-eared bats may occur if removal of woody vegetation occurs during the active season, April 15 - October 1. Tree clearing activities conducted when the species is in hibernation are not anticipated to result in direct impacts to individual bats but could result in indirect impacts due to removal of suitable foraging and roosting habitat. The Applicants will consult with the USFWS to develop necessary avoidance and minimization measures for this species and will comply with any applicable USFWS requirements in place at the time of Project construction.

Similar to the northern long-eared bat, tree clearing may impact individual tri-colored bats if tree removal occurs during their active season. Tree clearing activities conducted when the species is in hibernation is not anticipated to result in direct impacts to individual bats but could result in indirect impacts due to removal of suitable foraging and roosting habitat. Avoidance and minimization measures implemented for the northern long-eared bat would also serve to protect tri-colored bats. If the USFWS reaches a decision on the final rule listing the species as endangered prior to Project construction, the Applicants will consult with the USFWS to determine if additional measures are needed to prevent adverse impacts to tri-colored bats.

Monarch Butterfly

Construction activities involving clearing and grading may impact monarch butterfly individuals. These activities will occur throughout all Project Components. If the USFWS determines the monarch butterfly should be listed and protection for the species coincides with Project planning, permitting, and/or construction, the Applicants will review Project activities for potential impacts on the species, develop appropriate avoidance and minimization measures, and consult with the USFWS as appropriate.

Whooping Crane

Potential impacts to whooping cranes could occur as a result of collision with transmission lines. The new transmission line corridors associated with the Mississippi River Crossing Options could pose a potential threat to whooping cranes should they be present. However, given the rarity of whooping cranes in Minnesota, their presence is not anticipated. Implementation of APLIC safety standards will minimize the potential for whooping crane collisions.

Bald and Golden Eagles

Potential impacts to bald and golden eagles could occur as a result of collision with transmission lines or if construction activities are conducted within 660 feet of an active eagle nest. During the nesting season construction noise and human activity may disturb nesting eagles to such a degree that adults abandon the nest (reference (47)). Suitable nesting habitat is present in the vicinity of the Minnesota River Crossing Options. If construction activities 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 spring (i.e., early 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. Implementation of APLIC safety standards will minimize the potential for bald and golden eagle collisions.

Migratory Birds

Potential indirect impacts to migratory birds, including BCC, could occur as a result of loss of habitat or displacement during construction activities. Vegetation clearing and other ground disturbing activities could directly impact migratory birds should they be nesting within or adjacent to construction areas. Where possible, the Applicants will

conduct these activities outside of the nesting season or conduct pre-construction nest surveys in areas of suitable habitat.

As mentioned in Section 6.6.5, once the Project is operational, there is potential for impacts to migratory birds as a result of collisions with transmission lines and associated equipment. The threat of collision is already present along the existing infrastructure; as such, the second circuit is not anticipated to pose an increased threat. However, areas of new transmission line corridor, particularly the Mississippi River Crossing Options, could pose new potential threats of collision. As discussed in Section 6.6.5, the Project will be constructed according to APLIC recommended safety standards to reduce the potential for avian collisions.

6.6.7.2 State Protected Species

State-listed threatened or endangered species are protected under the Minnesota Endangered Species Statute (Minn. Stat. § 84.0895). The MDNR NHIS database was queried on March 13, 2023, to identify known occurrences of state protected threatened and endangered species within the Proposed Route. The NHIS query identified three endangered, five threatened, and thirteen special concern species that have been documented within one mile of the Proposed Route; these species are summarized in Table 6.6-10. Although state special concern species are tracked and monitored by the MDNR, they are not legally protected under state law.

Table 6.6-10 Natural Heritage Information System Database Records Within One Mile of the Proposed Route

Common Name	Scientific Name	State Status[1]	Habitat[2]
Vascular Plants			
Butternut	*Juglans cinerea*	END	Mesic hardwood forests.
Hill's Thistle	*Cirsium pumilum var. hillii*	SPC	Southern dry prairies and southern dry savannas.
Rock Sandwort	*Minuartia dawsonensis*	THR	Sand and gravel deposits.
Small White Lady's-slipper	*Cypripedium candidum*	SPC	Mesic prairies with deep soil.
Sterile Sedge	*Carex sterilis*	THR	Calcareous fens.
Tubercled Rein Orchid	*Platanthera flava var. herbiola*	THR	Moist or wet meadows, sunny swales in savannas, and margins of shallow marshy lakes.

Common Name	Scientific Name	State Status[1]	Habitat[2]
Aquatic Species			
Black Sandshell	*Ligumia recta*	SPC	Riffle and run areas of medium to large rivers in areas dominated by sand or gravel.
Creek Heelsplitter	*Lasmigona compressa*	SPC	Creeks, small rivers, and the upstream portions of large rivers.
Least Darter	*Etheostoma microperca*	SPC	Clear freshwater streams and lakes, with cool to warm waters.
Mudpuppy	*Necturus maculosus*	SPC	Medium to large rivers and larger lakes.
Pugnose Shiner	*Notropis anogenus*	THR	Clear glacial lakes and low gradient small-to-moderate-sized streams in areas of little current.
Reptiles			
Blanding's Turtle	*Emydoidea blandingii*	THR	Wetland complexes and adjacent sandy uplands for nesting.
Birds			
Acadian Flycatcher	*Empidonax virescens*	SPC	Large tracts of mature, intact, closed-canopy deciduous forest.
Cerulean Warbler	*Setophaga cerulea*	SPC	Large tracts of deciduous forest with mature to old-growth trees and a structurally diverse canopy.
Henslow's Sparrow	*Ammodramus henslowii*	END	Uncultivated grasslands and old fields with stalks for singing perches and a substantial litter layer.
Lark Sparrow	*Chondestes grammacus*	SPC	Dry grasslands with a specific set of components and characteristics: short and/or sparse grasses (usually native) in areas of sand or gravel soils, with at least some bare ground and widely scattered or patchy trees.
Loggerhead Shrike	*Lanius ludovicianus*	END	Native and non-native upland grasslands and sometimes in agricultural areas where short grass vegetation and perching sites such as hedgerows, shrubs, and small trees are found.
Marbled Godwit	*Limosa fedoa*	SPC	Native grasslands with sparse to moderate cover, adjacent to a complex of wetlands.
Peregrine Falcon	*Falco peregrinus*	SPC	Nest primarily on buildings and bridges in urban settings and also use historic eyries on cliffs along lakes and rivers.
Red-shouldered Hawk	*Buteo lineatus*	SPC	Large tracts of mature deciduous forest with scattered wetland openings.
Trumpeter Swan	*Cygnus buccinator*	SPC	Small ponds and lakes or bays on larger water bodies with extensive beds of emergent vegetation such as cattails, bulrushes, and sedges.

1 END – endangered, THR – threatened, and SPC – special concern. No species identified in the NHIS database are federally listed.

2 Habitat information obtained from the MDNR Rare Species Guide (reference (48)).

6.6.7.2.1 Impacts and Mitigation

Potential impacts to and mitigation measures for state protected species are discussed by species or species category for all Project Components. A Natural Heritage Review request was submitted through the MDNR Minnesota Conservation Explorer on August 15, 2023 (Project ID 2023-00630). The Applicants will continue to work with the MDNR to avoid or minimize adverse impacts to state protected species and will implement appropriate, species-specific BMPs if Project activities will take place during the species' active season.

Vascular Plants

None of the vascular plant species identified in Table 6.6-10 have been documented within the Proposed Route. The majority of the Proposed Route consists of agricultural land cover, which is not suitable habitat for these species. However, areas of natural vegetation provide suitable habitat for butternut, Hill's thistle, and tubercled rein orchid. Potential impacts to these species could occur as a result of vegetation clearing and grading activities. Impacts are not anticipated where the second circuit will be strung along existing infrastructure given that the existing right-of-way is routinely disturbed during maintenance activities. Impacts to these species would be minimized by limiting clearing to the right-of-way and spanning areas of natural vegetation and wetlands to the extent feasible.

Aquatic Species

The black sandshell mussel is the only aquatic species identified in Table 6.6-10 that has been documented within the Proposed Route. Habitat suitable for the mudpuppy salamander is present in the Mississippi River, but no suitable habitat is present for the other aquatic species identified in Table 6.6-10. No in-stream work will be required to construct the Project; however, potential runoff from Project workspaces could temporarily decrease water quality and impact aquatic species. The Applicants will implement appropriate BMPs to prevent erosion and sediment runoff and protect water quality. As such, adverse impacts to aquatic species are not anticipated.

Blanding's Turtle

Habitat suitable for Blanding's turtles is present within the Proposed Route, and the species was documented on the edge of the Proposed Route. Potential impacts to Blanding's turtles could occur as a result of ground disturbing activities during construction; these potential impacts could be minimized by spanning large wetland

complexes with adjacent sandy uplands. This impact minimization measure was implemented during construction of the existing infrastructure and will be implemented in areas where new transmission line corridor is proposed. Structure placement in areas where new transmission line corridor is proposed has not been finalized. As noted above, the Applicant submitted a Natural Heritage Review to the MDNR and will continue to work with the MDNR to avoid or minimize adverse impacts to state protected species, such as Blanding's turtles, and will implement appropriate, species-specific BMPs if Project activities will take place during the species' active season.

Birds

The cerulean warbler, marbled godwit, and peregrine falcon are the only species identified in Table 6.6-10 that have been documented within the Proposed Route. Suitable habitat for Henslow's sparrow, lark sparrow, and loggerhead shrike is present within the Proposed Route but not for the other bird species identified in Table 6.6-10. Potential impacts to and mitigation for these species is the same as discussed above in Section 6.6.6.1 for migratory birds.

6.7 Unavoidable Impacts

Minn. R. 7850.1900, subp. 3(G) requires that an application discuss "human and environmental effects that cannot be avoided if the facility is approved at a specific site or route." The Project has been sited and designed to avoid, minimize, or mitigate potential impacts to the degree possible and practicable, as outlined throughout this Application. However, as is the case with most construction projects, some impacts are unavoidable. Environmental impacts that are not entirely avoidable are described below for the construction and operation phases of the Project.

Unavoidable impacts that will occur during construction of the Project include the following:

- Conversion of land use and land cover (i.e., agricultural land and forest)
- Construction-related noise
- Visual impacts from construction activities
- Construction-related traffic
- Criteria pollutant and GHG emissions from construction equipment
- Wetland impacts (to be confirmed after wetland delineation)

- Soil compaction and erosion
- Vegetation clearing
- Wildlife displacement and habitat loss

Unavoidable impacts that are anticipated to last the life of the Project (operation) include the following:

- Visual impacts
- Interference with AM radio signals
- Criteria pollutant and GHG emissions from operation and maintenance activities
- Maintenance of tall growing vegetation, including trees
- Potential for avian collisions

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

7 Federal and State Agency, Local Government, and Public Involvement

This section describes outreach efforts conducted by the Applicants and discusses pre-application involvement by federal, state, and local agencies as well as the public information outreach campaign. Throughout the process, the Applicants provided opportunities for stakeholders and potentially affected landowners to participate in the Project. This engagement provided the Applicants with valuable insight into landowner and public agency preferences regarding development of the Project.

7.1 Agency Involvement in Pre-Application

As part of pre-application outreach, the Applicants mailed over 100 90-day pre-application notice letters to relevant LGUs and tribal representatives on March 31, 2023 (Appendix K). The notice letter introduced the Project and offered an opportunity to request a consultation meeting regarding the Project.

In April 2023, the Applicants mailed 130 postcards to LGUs, tribal representatives, local senators and representatives, and relevant state and federal agencies, providing notification of the three Project open houses (Appendix E). In addition to providing information on dates and locations of the open houses, notifications also included a general Project description, a Project schedule, a map of the Project Study Area, the Project's website address, and Project contact information. Project open houses are discussed in Section 7.2.2.

A summary of correspondence with federal and state agencies and LGUs is included below. The Applicants will continue to communicate with federal and state agencies and LGUs as the Project moves forward and will seek any necessary permits.

7.1.1 Federal Agencies

The Applicants corresponded with one federal agency, the USFWS, regarding the Project.

7.1.1.1 U.S. Fish and Wildlife Service

The Applicant reached out via email to Shauna Marquardt of the USFWS Minnesota-Wisconsin Ecological Services Field Office in August 2023 to provide Project information and answer any questions the USFWS may have. The email also provided information on the Commission's upcoming public review process of the Route

Permit application. As of the publication of this document, no response has been received from the USFWS, and no further correspondence has occurred.

7.1.2 State Agencies

The Applicants corresponded with the following state agencies regarding the Project: MDNR MnDOT, and the Minnesota SHPO.

7.1.2.1 Minnesota Department of Natural Resources

The Applicants, along with staff from Barr, met with the MDNR on June 27, 2023, to discuss the overall Project and potential impacts to sensitive resources associated with the Mississippi River Crossing Options. Melissa Collins, MDNR Regional Environmental Assessment Ecologist, followed up with a letter to the Applicant on July 31, 2023; this letter is provided in Appendix L.

The MDNR indicated that a new calcareous fen had been identified near Saint Martin and that it was in the process of undergoing state approval. So that potential impacts to the fen could be assessed, the MDNR provided a shapefile containing the Saint Martin 15 fen location to the Applicants on June 28, 2023.

The MDNR had concerns with Mississippi River Eastern Crossing Option in that it would parallel an existing transmission line but would not share any existing right-of-way, thereby fragmenting an island in the Mississippi River. There was a discussion regarding the extensive tree clearing that would be needed for the Eastern Crossing Option and that the area may contain the state endangered butternut (*Juglans cinerea*) tree. The MDNR recommended a tree survey and a Minnesota Conservation Explorer Natural Heritage Review.

The Applicants discussed whether the existing structures associated with the parallel transmission line could be upgraded to allow the new circuit to be hung on the same pole as the existing line and, therefore, share existing right-of-way. This option is not currently being considered as part of this Application as it would require removing existing structures and constructing new, taller, double-circuit structures at the crossing. This option would be more expensive and would potentially increase the likelihood of avian conflicts with the transmission lines due to the taller structures and additional planes of lines extending vertically.

7.1.2.2 Minnesota Department of Transportation

The Applicant held a virtual meeting with several staff members from MnDOT on August 3, 2023. The Applicant shared a presentation of the Project with MnDOT during the meeting and answered questions.

On August 24, 2023, Stacy Kotch Egstad, Utility Routing and Siting Coordinator for MnDOT, submitted a letter to the Applicant with a cursory review in response of information exchanged during the August 3, 2023, meeting. The letter from MnDOT, which is provided in Appendix L, indicates the following:

- Existing poles, where applicable, including a second set of conductors on all crossings of I94, were previously permitted by MnDOT.
- For any new construction associated with the Project, including new pole placement and second stringing in areas over/within the state trunk highway system, additional consultation would be required.
- Should the Applicant plan to utilize any portion of MnDOT right-of-way for temporary access and/or staging during construction activities, staff from MnDOT's Office of Environmental Stewardship would request the opportunity to review for unique environmental resources.

7.1.2.3 Minnesota State Historic Preservation Office

The Minnesota SHPO was contacted on March 7, 2023, to request information on known cultural resources with the Project Study Area. The Minnesota SHPO responded on March 10, 2023, with a Microsoft Access database file containing all known records of cultural resources within the Project Study Area. This dataset was incorporated into Section 6.5.

7.1.3 Local Government Units

The Applicants corresponded with the following LGUs regarding the Project: Stearns and Wright counties.

7.1.3.1 Sherburne County and Wright County

The Applicants met with zoning and planning administrators for Sherburne and Wright counties on August 30, 2023, to discuss Project details and permitting and construction timelines, with a primary focus on the options for crossing the

Mississippi River. The Applicants informed Sherburne and Wright counties that it was looking for crossing options that create the least amount of impact to the Mississippi Wild & Scenic River District, and that the crossings are being proposed in locations where Xcel Energy owns the land on both sides of the Mississippi River. Wright County stated that they will check to see if, in addition to the Commission's approval, any local permitting would be required of a new crossing of the Mississippi Wild & Scenic River District. Sherburne County sent an email after the meeting stating that both of the proposed crossing options appear to be entirely within the City of Becker's zoning authority on the north side of the Mississippi River in Sherburne County.

7.2 Public Information Outreach

Public engagement for the Project consisted of informational mailings and open house meetings, as described below.

7.2.1 Mailings and Newsletters

In April 2023, the Applicants mailed nearly 3,000 postcards to landowners in the Project Study Area (Appendix M) providing notification of the April 2023 open houses to landowners and agencies. As noted above, in addition to providing information on dates and locations of the open houses, notifications also included a general Project description, a Project schedule, a map of the Project Study Area, the Project's website address, and Project contact information. Open houses were also advertised in the Alexandria Echo Press, the Becker Patriot News, and the St. Cloud Times.

7.2.2 Open House Meetings

Four open house meetings were held for the Project, two in-person and two virtual:

- Alexandria Holiday Inn, Alexandria, MN - April 11, 2023
- Becker Community Center, Becker, MN - April 12, 2023
- Virtual - April 13, 2023 (1:00pm and 6:00pm)

A total of 12 people attended the in-person open house in Alexandria, 17 people attended the in-person open house in Becker, and 25 people logged on to attend the virtual meetings. During and after the open house meetings, formal and informal

comments were collected. A total of four comments were submitted, one from each in-person open house and two submitted by email.

7.2.2.1 Summary of Comments

Comments submitted about the Project during and after the open house meetings were centered on the following themes:

- Use of existing infrastructure will lessen the disturbance to farmland.
- Request for Project construction to occur after harvest to minimize damage to fields.
- Opposition of a previously reviewed but rejected Mississippi River Crossing Option because it bisects and would disrupt long-standing research at the University of Minnesota Sand Plain Research Farm.

7.3 Route Modifications Incorporated Through Public and Agency Involvement

The Applicants worked with the public and agencies to inform the routing process. The majority of the Project involves stringing a second circuit along existing infrastructure and taps or bypasses associated with substations along that line. As such, Route modifications were not made; however potential alignment modifications within the Route were considered for crossing the Mississippi River into the proposed Big Oaks Substation.

- A third Mississippi River Crossing Option east of the Monticello Nuclear Generating Plant was originally considered (Map 5). As noted in Section 7.2.2.1, the Project received a comment from the University of Minnesota Sand Plain Research Farm with concerns that this alignment would bisect and disrupt long-standing research at the University of Minnesota Sand Plain Research Farm. In addition, as noted in Section 3.1.2, this alignment was rejected based on evaluation against the guiding factors outlined in Section 3.1 including effect on human settlement, recreation, tourism and costs of constructing, operating, and maintaining the facility. The rejected alignment is longer than the other two options, has greater linear impacts on the Mississippi Wild & Scenic River District and is more expensive. Additionally, challenges and costs related to the construction, operation and maintenance of the

alignment associated with crossing up to seven different existing transmission lines near the Monticello Substation and Monticello Nuclear Generating Plant led to the alignment's rejection.

8 Permits, Approvals, Consultations, and Reviews

8.1 Anticipated Permits, Approvals, Consultations, and Reviews

The Project will require several regulatory permits, approvals, consultations, and reviews; these are summarized in Table 8.1-1. All permits, approvals, consultations, and reviews required for the Project will be obtained prior to the onset of construction in applicable areas.

Table 8.1-1 Anticipated Permits, Approvals, Consultations, and Reviews

Permit/Compliance	Administering Agency
Federal	
Section 7 Consultation	USFWS
Section 10 Permit	USACE
Section 404 Permit	USACE
Notice of Proposed Construction and Actual Construction (7460)	FAA
Spill Prevention, Control, and Countermeasure (SPCC) Plan	EPA
Farmland Protection Policy Act/Farmland Conversion Impact Rating	USDA/NRCS
State	
Threatened & Endangered Species Natural Heritage Review	MDNR
License to Cross Public Waters or State Lands	MDNR
Construction Dewatering Permit	MDNR
Utility Permit	MnDOT
Driveway/Access Permits	MnDOT
Oversize/Overweight Permits	MnDOT
Wetland Conservation Act Exemption Concurrence	Board of Water and Soil Resources
Section 401 Water Quality Certification	MPCA
National Pollutant Discharge Elimination System (NPDES) Permit (Construction Stormwater)	MPCA
Cultural Resources Consultation	Minnesota State Historic Preservation Office/State Archaeologist
Agricultural Impact Mitigation Plan	Minnesota Department of Agriculture

Permit/Compliance	Administering Agency
Local	
Road Crossing/Right-of-Way Permits	County, Township, City
Public Lands Permits - Local	County, Township, City
Utility Permits	County, Township, City
Oversize/Overweight Permits	County, Township, City
Driveway/Access Permits	County, Township, City
Municipal Stormwater Permits	County, Township, City

8.2 Federal

8.2.1 U.S. Fish and Wildlife Service, Federal Threatened and Endangered Species Review

The ESA, as amended, directs the USFWS to identify and protect endangered and threatened species and their critical habitat. Section 9 of the ESA prohibits take of federally-listed species; take is defined as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in any such conduct" The term "harm" includes significant habitat alteration which kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. There is one federally listed and legally protected species that could potentially be present within the Proposed Route, the northern long-eared bat.

Projects involving federal lands, funding or authorizations require consultation between the lead federal agency (i.e., the USACE) and the USFWS, pursuant to Section 7 of the ESA. If it is determined that a project will have adverse impacts on a listed species, a Biological Opinion and Incidental Take Statement will be issued by the USFWS.

Project-specific consultations were initiated via email to Shauna Marquardt of the USFWS Minnesota-Wisconsin Ecological Services Field Office in August 2023. The Applicants will coordinate further discussion with the USFWS; however, the Applicants do not anticipate adverse impacts on federally listed species; therefore, an Incidental Take Permit will not likely be necessary.

8.2.2 U.S. Army Corps of Engineers, Section 10 River and Harbors Act Permit

The USACE regulates impacts to navigable waters of the U.S. under Section 10 of the River and Harbors Act. The Applicants will apply for a permit to cross the Mississippi River once a Route Permit is issued for the Project.

8.2.3 U.S. Army Corps of Engineers, Section 404 Clean Water Act Permit

A Section 404 permit is required from the USACE under the CWA for discharges of dredged or fill material into waters of the U.S. The Applicants will apply for these permits once a Route Permit is issued for the Project.

The Project would not require replacement wetlands under Minnesota law because it would be covered under the Federal Approvals exemption for utilities. In accordance with Minn. Stat. § 103G.2241, subd. 3 and 6 and Minn. R. 8420.0420, subp. 4, a replacement plan is not required for wetland impacts resulting from the construction, maintenance, or repair of utility lines, when such a project is authorized by the USACE under Section 404 of the CWA.

8.2.4 Federal Aviation Administration, Notice of Proposed Construction and Actual Construction or Alteration, Part 7460 Review

FAA notice and approval are required for structures 200 feet above ground level or those that may exceed an imaginary surface extending outward and upward at certain slopes defined in the 14 CFR Part 77.9. Form 7460-1 shall be submitted to the FAA for notice of construction. Each individual structure meeting these requirements will be registered for notice, which would include information such as the latitude and longitude, structure height, and the elevation at the structure location. The FAA then conducts an aeronautical study for potential airspace impacts and issues a determination of hazard or no hazard. If a structure location is changed prior to construction, it is necessary to resubmit Form 7460-1 for that structure. When the construction is complete, as-built information will be submitted using Form 7460-2.

8.2.5 U.S. Environmental Protection Agency, Spill Prevention, Control, and Countermeasure Plan

A Spill Prevention, Control, and Countermeasure (SPCC) plan is required to contain and prevent discharge of oil or other petroleum products into waters of the U.S. The Applicants will prepare an SPCC plan for the construction phase of the project if

contractors bring in stationary or mobile fueling tanks that exceed the 40 CFR, Part 112 threshold requirements (1,320 gallons of oil capacity). The SPCC plan will cover all laydown, staging, parking, and refueling activities along the right-of-way. A separate facility SPCC plan will be created for Big Oaks Substation if regulatory oil thresholds are exceeded.

8.2.6 U.S. Department of Agriculture/Natural Resources Conservation Service, Farmland Protection Policy Act/Farmland Conversion Impact Rating

The FPPA is intended to minimize the impact Federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. A FPPA form will be filled out and filed with the USDA/NRCS if applicable.

8.2.7 U.S. Fish and Wildlife Service, Special Use Permit

A Special Use Permit is required from the USFWS if the Proposed Route intersects with USFWS-owned land or easements. The Applicants have existing Special Use permits that allow for a second circuit to be strung on existing right of way that crosses the Douglas and Stearns County WPAs. Still, the Applicants will re-visit these Special Use Permits with USFWS to verify no amendments are necessary to accommodate the Project. The Project is not anticipated to adversely impact other federally owned parcels.

8.3 State

8.3.1 Minnesota Department of Natural Resources, State Threatened and Endangered Species Review

Pursuant to Minnesota's Endangered Species Statute (Minn. Stat. § 84.0895), the MDNR is required to adopt rules designating species meeting the statutory definitions of endangered, threatened, or species of special concern and regulate treatment of these species. A Natural Heritage Review request was submitted through the MDNR Minnesota Conservation Explorer on August 15, 2023 (Project ID 2023-00630). The Applicants will consult with the MDNR regarding any Project-specific construction considerations related to Minnesota's Endangered Species Statute.

8.3.2 Minnesota Department of Natural Resources, License to Cross Public Waters or State Lands

A MDNR Utility License is required for the passage of any utility over, under, or across any public waters or state land. The MDNR Division of Lands and Minerals is responsible for granting approval in the form of a crossing license. In addition to a long-term license fee, there is a one-time crossing fee for each waterbody crossed. Agency review time of the application varies depending on the crossing technique and involves review and approval from several state departments and associated divisions. The Applicants will consult with the MDNR and will obtain a license, as applicable.

8.3.3 Minnesota Department of Natural Resources, Construction Dewatering Permit

The MDNR also regulates water appropriation activities that exceed 10,000 gallons per day or a total of one million gallons per year under Minn. R. 6115.0620. The Applicants will obtain authorization for the Project under MDNR's General Permit 1997-2005 for Temporary Projects, only as necessary, for activities such as construction site dewatering.

8.3.4 Minnesota Department of Transportation, Utility Permit

The Applicants will apply for a Utility Accommodation on Trunk Highway Right-of-Ways (Form 2525) as necessary. This permit is required for the construction of utility facilities crossing or paralleling existing trunk highway rights-of-way.

8.3.5 Minnesota Department of Transportation, Driveway Access Permit

The Applicants will apply for an Access/Driveway Permit (Form 1721) for using driveways and access points to trunk highways crossed or paralleled by the Project during construction.

8.3.6 Minnesota Department of Transportation, Oversize/Overweight Permits

The Applicants will apply for oversize and/or overweight permits for all vehicles using state trunk highways during construction and operation of the Project. These permits are required for vehicle loads of excess height, length, and/or weight, although overlength utility poles may be exempt. Certain overwidth and/or overlength loads require escorts, which the Applicants will arrange as necessary.

8.3.7 Minnesota Board of Water and Soil Resources, Wetland Conservation Act Exemption Concurrence

The Minnesota Wetland Conservation Act is administered at the local level with oversight from BWSR in accordance with Minn. R. 8420. The Project may require a permit under these rules if permanent impacts to wetlands cannot be avoided.

8.3.8 Minnesota Pollution Control Agency, Section 401 Water Quality Certification

The MPCA requires Section 401 water quality certification to obtain a federal permit for any activity potentially resulting in discharge to waters of the U.S. This certification ensures the Project will comply with state water quality standards according to the CWA. The Applicants will obtain Section 401 water quality certification as necessary for the Project.

8.3.9 Minnesota Pollution Control Agency, National Pollutant Discharge Elimination System Permit

The MPCA requires an NPDES Permit for stormwater discharges associated with construction activities disturbing one acre of land or greater. Prior to construction, the Applicants will obtain a construction stormwater permit and develop and implement a SWPPP that identifies BMPs and construction measures to contain soils and to minimize discharge of sediment during stormwater events.

8.3.10 State Historic Preservation Office, Cultural Resources Consultation

The Applicants have contacted the Minnesota SHPO to determine if features eligible for listing in the National Record of Historic Places are present within the area encompassed by the Project. The Applicants will continue to coordinate with the Minnesota SHPO.

8.3.11 Agriculture Impact Mitigation Plan

The Applicants will follow an updated AIMP for the CapX2020 transmission projects (reference (49)) A draft of the updated AIMP is in Appendix F. This plan describes measures and BMPs used in agricultural land to minimize any negative impacts on cultivated fields and drain tile systems. Landowners would be compensated for any loss of or damage to crops, or for lands that cannot be planted because of Project construction activities.

8.4 Local

8.4.1 Road Crossings/Right-of-Way Permits

These permits may be required to occupy/cross county, township, and city rights-of-way and roads.

8.4.2 Public Lands Permits

These permits may be required to occupy county, township, and city lands such as park lands, watershed districts, or other properties owned by these entities.

8.4.3 Utility Permits

These permits may be required to place utilities within county, township, and city rights-of-way and roads.

8.4.4 Over-size/Overweight Permits

These permits may be required to move over-width or heavy loads on county, township, or city roads and will be obtained once a Route Permit has been issued by the Commission.

8.4.5 Driveway/Access Permits

These permits may be required to construct access roads or driveways that access county, township or city roadways and will be obtained once a Route Permit has been issued by the Commission.

8.4.6 Municipal Stormwater Permits

A stormwater permit may be required from municipalities in the Proposed Route for stormwater discharges associated with construction activities disturbing one or more acres. A requirement of the permit is to develop and implement a SWPPP, which includes BMPs to minimize discharge of pollutants from the site.

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