BSSA

Big Stone South
to Alexandria

Application to the Minnesota
Public Utilities Commission
for a Route Permit for the

Big Stone South to Alexandria 345kV Transmission Line Project

MPUC DOCKET NO.
E017, ET10/TL-23-160

October 2024

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MISSOURI RIVER ENERGY SERVICES

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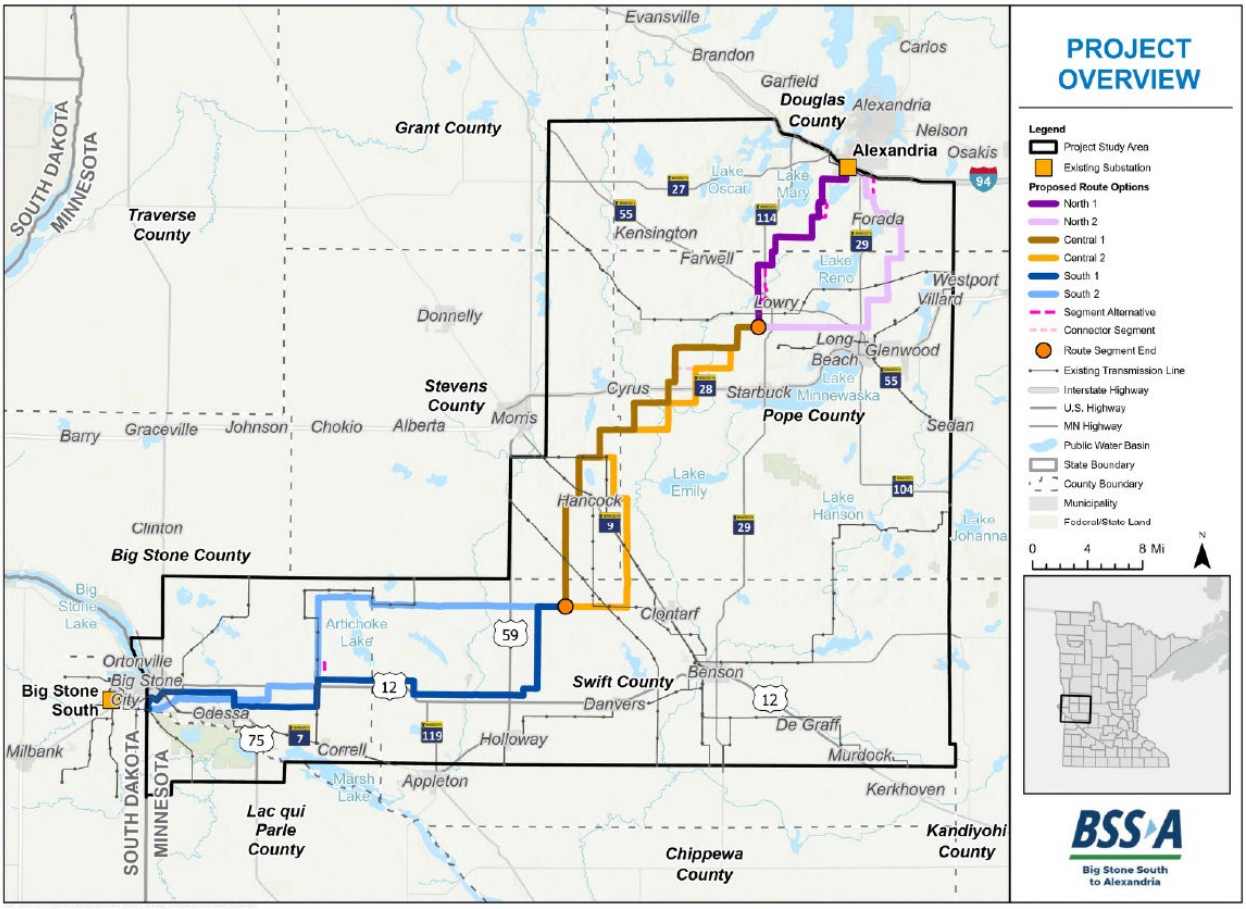
1.0 INTRODUCTION

Otter Tail Power Company (Otter Tail) and Western Minnesota Municipal Power Agency (Western Minnesota), through its agent, Missouri River Energy Services (MRES) (collectively, the Applicants), submit this Route Permit Application (Application) to the Minnesota Public Utilities Commission (Commission) for a route permit to construct the Big Stone South to Alexandria 345 kilovolt (kV) alternating current high voltage transmission line (HVTL) and associated facilities located within Minnesota (the Project). The Project will be constructed using double-circuit structures, however, only a single-circuit will be installed initially. The Project will be located in portions of Big Stone, Swift, Stevens, Pope, and Douglas Counties, Minnesota.

As shown in **Figure 1-1** below and in **Appendix D-1, Appendix D-2,** and **Appendix D-3**, the Project has been divided into three segments for the purposes of analyzing routing options:

- South Segment: between 38.8 to 41.9 miles of double-circuit capable 345 kV transmission line between the Minnesota/South Dakota border and continuing east to a point in Tara Township, Swift County, Minnesota, approximately ten miles northwest of the City of Benson, Minnesota (*see* **Appendix D-1**).
- Central Segment: between 34.4 to 38.5 miles of double-circuit capable 345 kV transmission line between a point in Tara Township, Swift County, Minnesota, and continuing east, northeast to a point in Ben Wade Township approximately 4.0 miles north of the City of Starbuck, Pope County, Minnesota (*see* **Appendix D-2).**
- North Segment: between 18.1 to 25.1 miles of double-circuit capable 345 kV transmission line between a point in Ben Wade Township and continuing northeast to the existing Alexandria Substation southwest of Alexandria, Minnesota (*see* **Appendix D-3**).

Figure 1-1 Project Overview Map



The Big Stone South to Alexandria Project is one segment of the larger Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project. The Project comprises the Western Segment of the Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project. A joint Certificate of Need (CN) application was filed for the Big Stone South – Alexandria – Big Oaks Project in Minnesota in MPUC Docket No. E002, E017, ET2, E015, ET10/CN-22-538 and a separate Route Permit application was filed for the Eastern Segment in MPUC Docket No. E002, E017, ET2, E015, ET10/TL-23-159. The Big Stone South to Alexandria Project also has an accompanying South Dakota transmission segment, which begins at the existing Big Stone South Substation located west of Big Stone City, South Dakota, and connects to the Project at the Minnesota/South Dakota border approximately one mile south of Big Stone City. The Applicants filed a facility permit application with the South Dakota Public Utilities Commission (SDPUC) in April 2024 for the South Dakota portion (SDPUC Docket No. EL24-015).

The Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project was studied, reviewed, and approved as part of the Long-Range Transmission Plan (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.[1]

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 the 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 in Minnesota. 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.

1.1 Project Ownership

The Project will be jointly owned by Otter Tail and Western Minnesota.

Otter Tail Power Company is an investor-owned electric utility headquartered in Fergus Falls, Minnesota, that provides electricity and energy services to over 133,000 customers, spanning 70,000 square miles in western Minnesota, eastern North Dakota, and northeastern South Dakota. Otter Tail wholly or jointly owns approximately 6,000 miles of transmission lines and approximately 1,100 megawatts (MW) of generation capacity in these three states 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. Western Minnesota owns generation and transmission facilities, the capacity and output of which are sold to MRES. MRES, which is headquartered in Sioux Falls, South Dakota, provides electricity, including conservation program services, to its 61-member municipal utilities in Iowa, Minnesota, North Dakota, and South Dakota, who in turn serve approximately 174,000 customers. MRES is also a transmission owning member of MISO.

[1] *See* MTEP21 Report Addendum: Long Range Transmission Planning Tranche 1 Executive Summary (2022), https://cdn.misoenergy.org/MTEP21%20Addendum-LRTP%20Tranche%201%20Report%20with%20Executive%20Summary625790.pdf (accessed October 9, 2024).

1.2 Permittee

Otter Tail and Western Minnesota are the requested permittees for the Project. Contact information is provided below:

Otter Tail Power Company
Jason Weiers
Manager, Transmission Project Development
215 South Cascade Street
Fergus Falls, MN 56537
(218) 739-8311
jweiers@otpco.com

Western Minnesota Municipal Power Agency
Brian Zavesky, P.E.
Senior Transmission Engineer
Missouri River Energy Services
3724 West Avera Drive
Sioux Falls, SD 57108
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2.0 REGULATORY PROCESS

2.1 Certificate of Need

Minnesota Statutes Section (Minn. Stat. §) 216B.243, subd. 2, states that "[n]o large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need by the Public Utilities Commission…" A large energy facility includes "any high-voltage transmission line with a capacity of 300 kV or more and greater than one mile in length in Minnesota" and "any high-voltage transmission line with a capacity of 100 kV or more with more than ten miles of its length in Minnesota."[2] An application for a CN to construct the Big Stone South – Alexandria – Big Oaks 345 kV Project was filed on September 29, 2023, in Docket No. E002, E017, ET2, E015, ET10/CN-22-538. The Project was included and identified as the Western Segment within the CN application.

The Commission granted a CN for the Big Stone South – Alexandria – Big Oaks 345 kV Project in October 2024 (order pending). Pursuant to Minn. R. 7850.2500, subp. 5, when the Commission has issued a CN for a high voltage transmission line project, the environmental impact statement prepared during the routing process shall not address questions of need, including size, type, and timing; questions of alternative system configurations; or questions of voltage.

2.2 Route Permit

Minn. Stat. § 216E.03, subd. 2, provides that "[n]o person may construct a high voltage transmission line without a route permit from the [C]ommission." An HVTL is defined by Minn. Stat. § 216E.01, subd. 4, as "a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kV or more and is greater than 1,500 feet in length." A "route" is defined by Minn. Stat. § 216E.01, subd. 8, as "the location of a high voltage transmission line between two end points. The route may have a variable width of up to 1.25 miles."[3] Because the Project involves construction of a 345 kV transmission line greater than 1,500 feet in length, a route permit is required.

This Application is submitted under the full route permitting process set forth in Minn. Stat. § 216E.03 and Minnesota Rules (Minn. R.) 7850.1700 to 7850.2700 and 7850.4000 to 7850.4400. The applicable statutes and rules require, in addition to other

[2] 2024 Minn. Sess. Law Serv. Ch. 126 (S.F. 4942) (amending Minn. Stat. § 216B.2421, subd. 2(2) and (3)).

[3] Minn. Stat. § 216E.01, subd. 8; *see also* Minn. R. 7850.1000, subp. 16.

information, that an applicant provide at least two proposed routes in its Route Permit application.

The Commission has adopted rules for the consideration of Route Permit applications in Minn. R. Ch. 7850. Minn. R. 7850.1900, subparagraph (subp.) 2 and 3, set forth the information that must be included in a Route Permit Application. A Route Permit Application 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. A copy of the Applicants' 90-day pre-application letter is provided in **Appendix B**.

In this Route Permit proceeding, Commission staff, Minnesota Department of Commerce, Energy and Environmental Review and Analysis (EERA) staff, and an administrative law judge will oversee evaluation and review of the proposed routes and the gathering of input from agencies, tribal governments, local units of government (LGUs), and the public.

Once the Commission finds the Application complete, notice of a scoping meeting for the environmental impact statement (EIS) will be provided to the potentially affected landowners (**Appendix N**), other stakeholders in the Project area and those individuals who have asked to be placed on the Project Contact List.

During the scoping process, EERA will gather information on potential impacts and mitigation measures that should be evaluated in the EIS. Based on public input, EERA will recommend impacts and mitigation measures, including alternatives, that it believes should be evaluated in the EIS. A Scoping Decision will then be issued that identifies the issues that will be evaluated in the EIS. EERA will issue a Draft EIS, and meetings will be held in the Project area to gather comments on the content of the Draft EIS. After these meetings, EERA will finalize the content based on the comments received and issue a Final EIS.

In addition to a Draft and Final EIS, public hearings on the Project will be held. The public will be invited to make comments on the Project at these hearings before an administrative law judge. After the hearings, the administrative law judge will provide a period during which stakeholders can submit written comments on the Project. Additionally, the administrative law judge will receive briefs from the Applicant and other parties to the proceeding. The administrative law judge will review this Application, the EIS, briefs, and comments received during the public hearings and, following the comment period, will prepare findings of fact, conclusions of law, and recommendations for the Commission. During an open meeting, the Commission will deliberate and make

a decision as to the route for the Project using the criteria set forth in Minn. Stat. § 216E.03, subd. 7(b), and Minn. R. 7850.4100 to guide its decision.

2.3 Public Input and Involvement

The Applicants employed various engagement methods to provide information about the Project to the public and federal, state, and local agencies, Tribal Nation representatives, and non-government organizations. These engagement methods included four rounds of in-person public open houses, direct mailings, and a Project website https://bigstonesouthtoalexandria.com/. Additional information regarding the public outreach efforts conducted prior to the filing of this Application is provided in **Section 8.2**. The public will be afforded additional opportunities to participate and comment on the Project in accordance with Minnesota laws and regulations. This process is described in **Section 2.2**.

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

The public and interested stakeholders will have the opportunity to review this Application and to submit comments to the Commission about the Project. A copy of the Application is available on the Project website at https://bigstonesouthtoalexandria.com/ and will be available on the Department of Commerce's energy project website (http://mn.gov/commerce/energyfacilities) and on eDockets in docket number E017, ET10/ TL-23-160. Additionally, this Application will be available at the following locations for the public to review:

Ortonville Public Library
412 NW 2nd Street
Ortonville, MN 56278

Benson Public Library
200 13th St N
Benson, MN 56215

Hancock Community Library
662 6th St, P.O. Box 305
Hancock, MN 56244

Glenwood Public Library
108 1st Ave SE
Glenwood, MN 56334

Douglas County Library
720 Fillmore St
Alexandria, MN 56308

Persons interested in receiving notices and other announcements about the Application can subscribe to the docket by visiting https://mn.gov/puc/, clicking on "eDockets" at the top of the page, clicking on "Go to eDockets" in the middle of the page, clicking on "eFiling Home/Login" in the left menu, clicking on the "Subscribe to Dockets" button, entering their email address and select "Docket Number" from the "Type of Subscription" dropdown box, then select "[23]" from the first Docket Number drop down box and enter "[160]" in the second box before clicking on the "Add to List" button. You must then click the "Save" button at the bottom of the page to confirm your subscription to the docket. After completion of these steps, the subscriber will receive an email at the designated address requesting confirmation of the subscription. Once received, the subscriber must confirm the subscription to begin receiving notice of filings in the docket.

Persons wanting to have their name added to the Project Route Permit proceeding mailing list (Docket No. E017, ET10/ TL-23-160) may register by contacting the public advisor in the consumer affairs office at the Commission at consumer.puc@state.mn.us, or (651) 296-0406 or (800) 657-3782. Please be sure to note: (1) how you would like to receive notices (regular mail or email), and (2) your complete mailing or email address.

Contact information for the Minnesota state regulatory staff for this Project are listed below:

Commission

Sam Lobby
121 7th Place East, Suite 350
St. Paul, MN 55101
(651) 201-2205 or (800) 657-3782
sam.lobby@state.mn.us
Website: www.mn.gov/puc/

EERA

Jenna Ness
85 7th Place East, Suite 280
St. Paul, MN 55101
(651) 539-1693 or (800) 657-3710
jenna.ness@state.mn.us
Website: www.mn.gov/commerce

2.4 Other Permits/Approvals

In addition to the Route Permit sought in this Application, several other permits, licenses, approvals, or consultations may be required to construct the Project depending on the actual route selected and the conditions encountered during construction. A list of the local, state, and federal permits that may be required for this Project is provided in Table 2.4-1. Any required permits will be obtained by the Applicants prior to construction. This list of permits/approvals is subject to change as Project development continues.

Table 2.4-1 Summary of Possible Permits, Licenses, Approvals, and Consultations

Administering Agency	Permit, Approval, or Consultation	Trigger/Description
Federal		
Federal Aviation Administration (FAA)	Notice of Proposed Construction and Actual Construction or Alteration (FAA Form 7460) (Determinations of No Hazard)	Required for construction or alteration of structures higher than 200 feet Above Ground Level, structures near airports, or siting within line of sight of radar of an air defense facility.
U.S. Army Corps of Engineers (USACE)	Section 404 Permit (filed jointly with the state 401 certification)	Impacts on waters of the United States.
	Section 10 Permit	Minnesota River crossing; required when crossing a navigable river as defined by USACE.
U.S. Fish and Wildlife Services (USFWS)	Section 7 consultation on Threatened and Endangered Species under the Endangered Species Act	Required when projects have a federal nexus. Consultation will depend on final design of the line and determination of effects. Applicants will coordinate with USFWS on avoiding or minimizing impacts and potential mitigation to protected species.
	Right of Way or Special Use Permit	For USFWS easements and fee title land, a Right of Way and/or Special Use Permit may be required for an easement and/or temporary access route.
	Migratory Bird Treaty Act compliance	Consultation regarding potential impacts on migratory birds.
	Bald and Golden Eagle Protection Act compliance	Consultation regarding potential impacts to bald and golden eagles.
U.S. Environmental Protection Agency (USEPA)	Spill Prevention, Control, and Countermeasure Plan	Not anticipated for the Project, however, it will be if substation work will require aboveground oil storage with 1,320 gallons or more capacity or below ground oil storage with 42,000 gallons or more capacity.

Administering Agency	Permit, Approval, or Consultation	Trigger/Description
U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS)	Farmland Protection Policy Act/Farmland Conversion Impact Rating	Federally funded projects associated with conversion of prime, unique, or important farmland to non-agricultural use will need to be reviewed for impacts, if required.
	Compliance with land enrolled in programs including Conservation Reserve Program (CRP), Wetland Reserve Program, and Grassland Reserve Program (GRP)	If land enrolled in these programs are crossed, Applicants will need to consult with NRCS on mitigation and/or permissions.
State		
Minnesota Public Utilities Commission	Certificate of Need	Needed to construct a large energy facility, which includes certain high-voltage transmission lines.
	Route Permit	Needed to construct a new high-voltage transmission line.
Minnesota State Historic Preservation Office (SHPO)	Cultural Resources Consultation	Cultural consultation will be in coordination with other agencies as a component of a federal nexus. Will require consultation on the results of cultural field surveys.
Minnesota Department of Natural Resources (MDNR)	State-listed Endangered Species Consultation	Depending on final alignment, work near state-sensitive habitat or known state-listed species will require consultation.
	License to Cross Public Lands and Waters	Required if a utility crosses over, under, or across any state land or public water identified on the Public Waters and Wetlands Maps.
	State Lease for Access Roads	Required if any access roads will cross state-managed lands.
	Compliance with Shoreland Ordinances	Shoreland is defined by MDNR as 1,000 feet from the ordinary high water level (OHWL) of a lake, pond, or flowage and 300 feet from a river or stream.
Minnesota Board of Water and Soil Resources (BWSR)	Approval	BWSR easements are present in the Project area; overhanging, spanning, or work within them will require consultation with BWSR.
	Wetland Conservation Act Approval(s)	May be required if impacts occur to wetlands.

Administering Agency	Permit, Approval, or Consultation	Trigger/Description
Minnesota Pollution Control Agency (MPCA)	Section 401 Clean Water Act Water Quality Certification	Required for development; will be filed jointly with the USACE 404 permit application.
	National Pollutant Discharge Elimination System (NPDES) Permit – Construction Stormwater Permit	Required if there will be ground disturbances over 1.0 acre. NPDES permit coverage should be obtained prior to construction but not more than a year prior. Requires preparation of a Stormwater Pollution Prevention Plan (SWPPP) prior to ground disturbances.
Minnesota Department of Transportation (MnDOT)	Tall Tower Permit	Will be done concurrently with FAA permitting.
	Highway Access Permit	Required if a permanent or temporary access road is needed off a state road.
	Oversize/overweight Permit	Required if construction equipment uses state roads.
	Utility Accommodation on Trunk Highway right-of-way (ROW)	Required if electrical lines are installed across/within a state road ROW. Applicants only anticipate overhanging Trunk Highway ROWs; no structures are anticipated to be placed within Trunk Highway ROWs.
	Miscellaneous Work Permit for Trunk Highways	Required if temporary work occurs in a state road ROW.
Local		
Local Permitting Authority	Utility crossing permits	Some counties may require a permit for crossing a county road.
Local Permitting Authority	Access permits	Some counties may require a permit for an access road on a county road.
Local Permitting Authority	Haul Agreements and oversize load permits	Use of local public roads to transport construction equipment and materials.
Local Permitting Authority	Shoreline Alteration Permit	Work within a shoreland, bluff, or bluff impact zone as defined by the local jurisdictional authority.
Other		
Existing Infrastructure Owners	Crossing Agreement	For each crossing, a ROW Crossing Agreement may be required

3.0 PROPOSED PROJECT

3.1 Segments and Proposed Route Options

As part of its routing analysis, the Applicants divided the Project into three Project Segments: South Segment, Central Segment, and North Segment (*see* **Figure 1-1**). Within each Project Segment, two end-to-end Route Options (that start and end at a common point) were identified (*see* **Appendix D**). The six Route Options include South 1, South 2, Central 1, Central 2, North 1, and North 2. The Route Options for this Project have Route Widths that are typically 1,000 feet wide, but there are portions of the Route Options where the Route Width is wider or narrower as described in **Section 3.2**.

Within the Route Options, Segment Alternatives and Connector Segments were also identified. Segment Alternatives are typically included in locations where landowners or agencies requested alternatives to the Route Options to avoid certain constraints, and where the alternatives had approximately comparable, but different, impacts. Connector Segments are included to provide opportunities to shift between Route Options when creating an end-to-end route for the Project.

The three Project Segments, Route Options, Segment Alternatives and Connectors Segments are shown in **Figure 1-1, Figure 3-1, Figure 3-2** and **Figure 3-3**. A narrative overview of each of the proposed Route Options, and the Segment Alternatives and Connector Segments identified within each Route Option, are provided below. More detailed descriptions of the end-to-end Route Options, Segment Alternatives and Connector Segments within these segments are included in Chapter 5. Detailed Route maps are provided in **Appendix D-1, Appendix D-2,** and **Appendix D-3**. Table 3.1-1 lists the routing terms and definitions used throughout this Application.

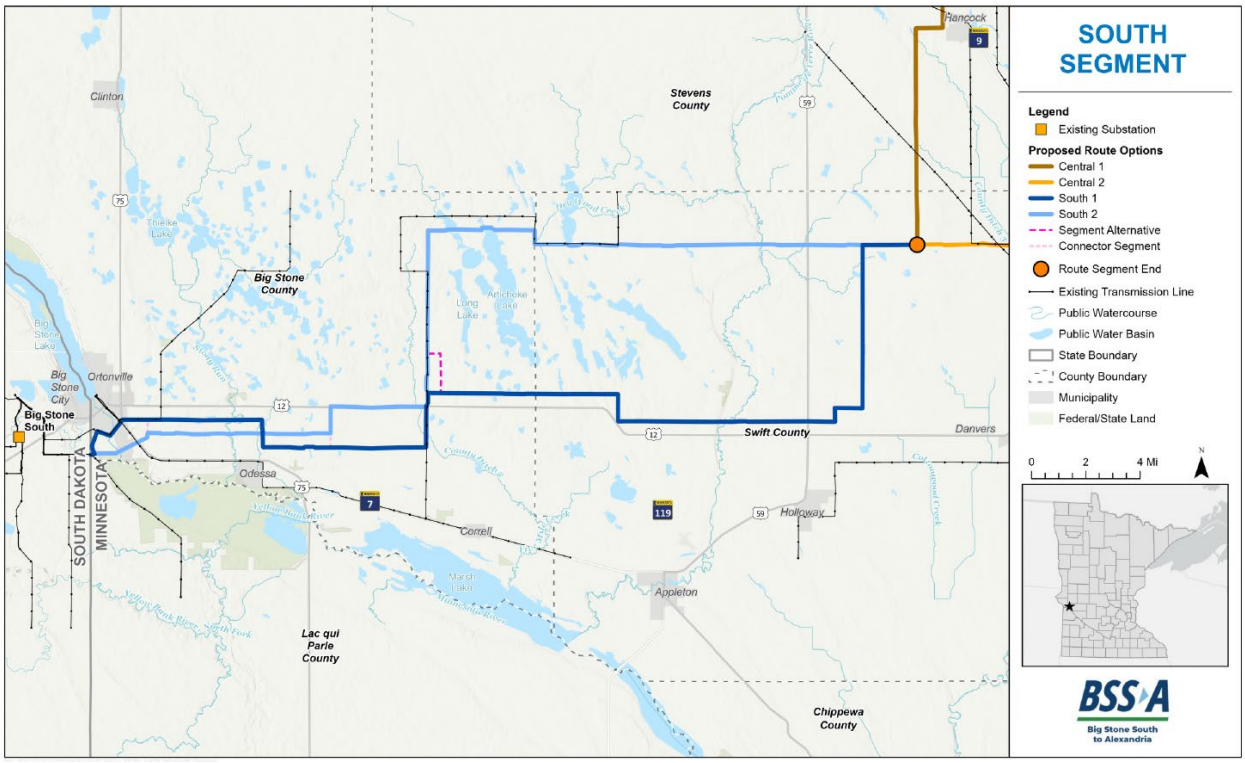
Table 3.1-1 Summary of Routing Terms

Term	Definition
Project Study Area	A larger area that the Applicants evaluated for potential routes as part of the route development process. It encompasses approximately 1,770 square miles and is approximately 58 miles long and 46 miles wide at its widest points.
Project Segment	Three regions of the Project used to organize the proposed Route Options, including: South Segment, Central Segment, and North Segment.
Route Option	End-to-end Routes (that start and end at a common point) within each Project Segment. The six Route Options include South 1, South 2, Central 1, Central 2, North 1, and North 2. The Route Options have Route Widths that are typically 1,000 feet wide, but there are portions of the Route Options where the Route Width is wider or narrower as described in **Section 3.2**.
Segment Alternative	Alternatives to a portion of a Route Option included in certain locations to avoid constraints, and where the alternatives had approximately comparable, but different, impacts. For the Project, the Segment Alternatives are identified as S18, N9, N10, and N11.
Connector Segment	Short connections that provide opportunities to shift between Route Options when creating an end-to-end route for the Project. For the Project, the Connector Segments are identified as S16, S17, and C11.
Route	A wide corridor between two end points that is defined by the Commission in a route permit. It establishes the area in which the Applicants will generally be authorized to construct the transmission line. The Route Width varies along the length of the transmission line.
Route Width	The area in which the Commission authorizes a permittee to place the proposed transmission line facilities. For the Project, the Route Width is typically 1,000 feet, but it varies along portions of the Route Options as described in **Section 3.2**.
Right-of-Way (ROW)	The ROW is the specific area around the transmission line that the Applicants will maintain and protect from encroachments to ensure the safe and reliable operation of the transmission line. For the Project, the ROW is generally 150 feet wide, 75 feet on both sides of the transmission line alignment.
Application Alignment	The general path that the transmission line will follow. The Application Alignment reflects the Applicants' initial thoughts on where the line will be built and where it turns or crosses from one side of the road to the other. The final alignment will likely be somewhat different due to input from landowners, agencies, and other utilities in the area.

3.1.1 South Segment

The South Segment originates at the Minnesota/South Dakota border approximately one mile south of Ortonville, Minnesota, and continues east to a point in Tara Township, Swift County, Minnesota, approximately ten miles northwest of the City of Benson, Minnesota (**Figure 3-1**). The South Segment includes two Route Options: South 1 (41.9 miles) and South 2 (38.8 miles). One Segment Alternative (S18) and two Connector Segments (S16 and S17) were identified in the South Segment (*see* **Appendix D-1**).

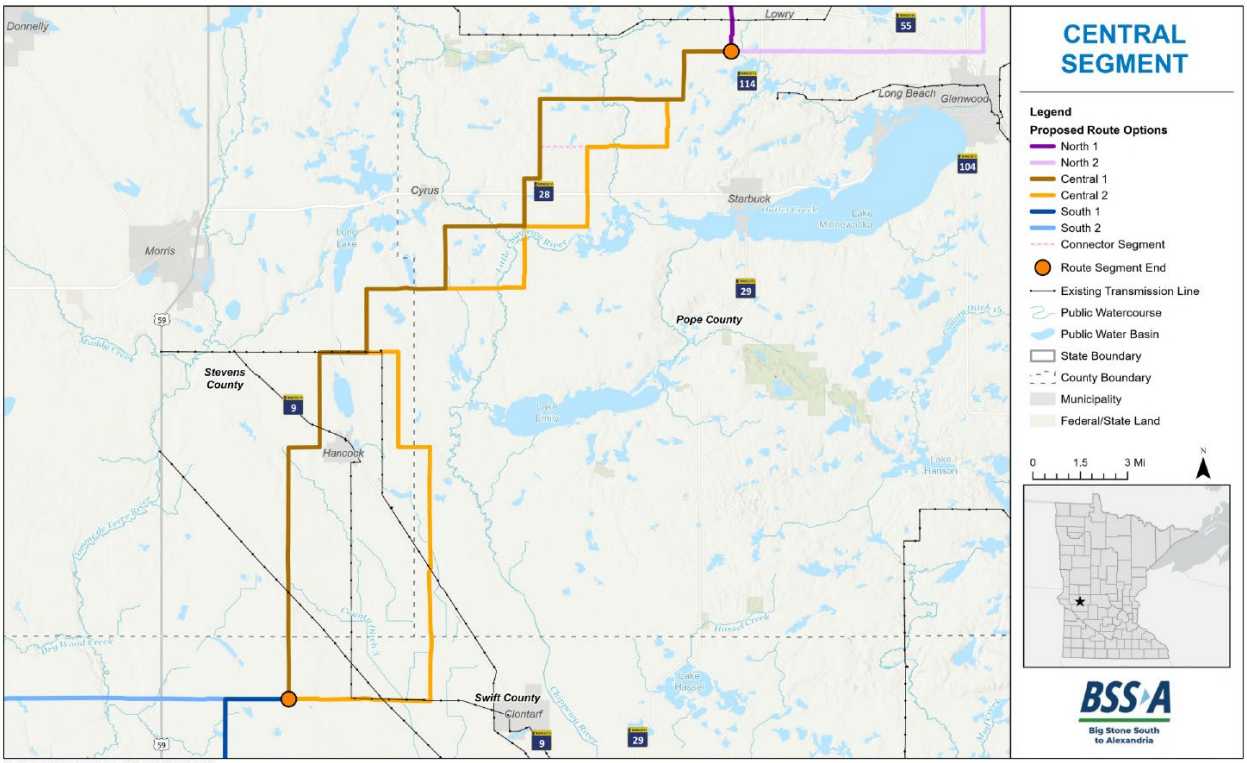
Figure 3-1 South Segment Overview Map



3.1.2 Central Segment

The Central Segment originates at the eastern end of the South Segment and continues east, northeast to a point in Ben Wade Township approximately four miles north of the City of Starbuck, Pope County, Minnesota (**Figure 3-2**). The Central Segment includes two Route Options: Central 1 (34.4 miles) and Central 2 (38.5 miles). No Segment Alternatives were identified in the Central Segment. One Connector Segment (C11) was identified in the Central Segment (*see* **Appendix D-2**).

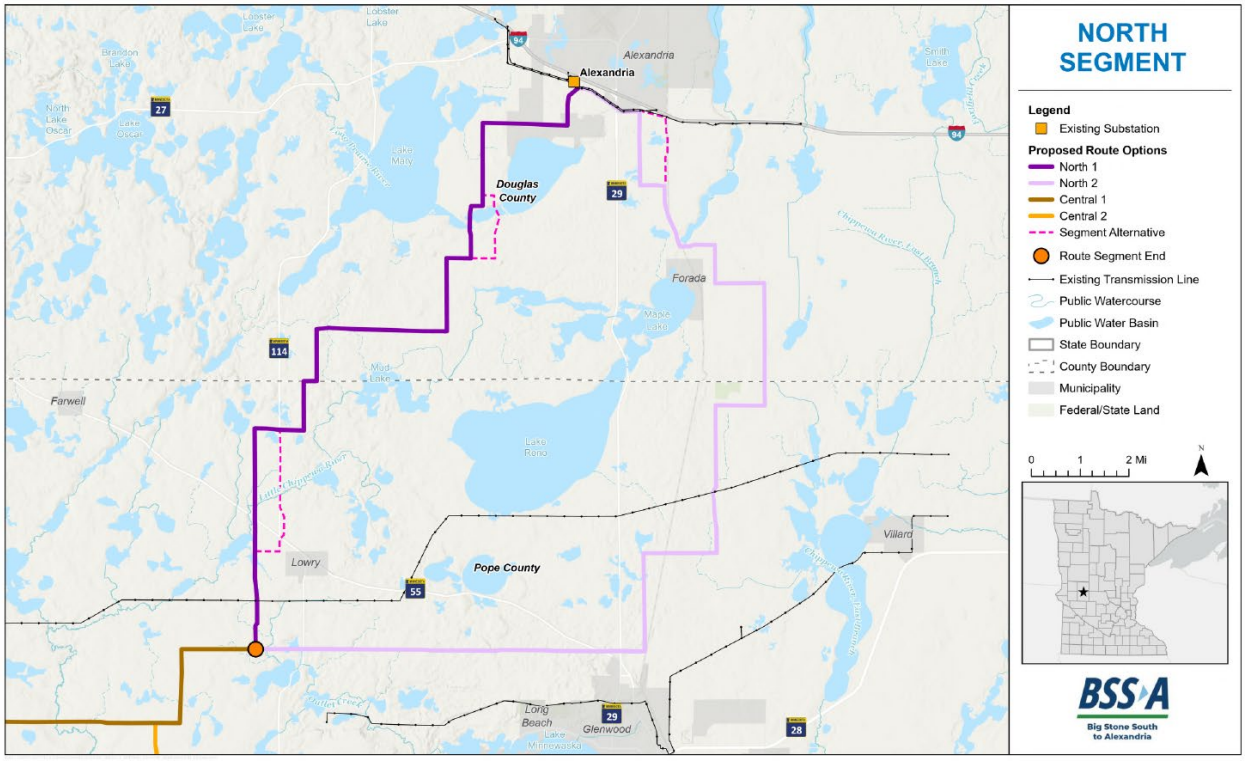
Figure 3-2 Central Segment Overview Map



3.1.3 North Segment

The North Segment originates at the eastern end of the Central Segment and continues northeast to the existing Alexandria Substation, southwest of the City of Alexandria, Minnesota, and adjacent to Interstate 94 (I-94) (**Figure 3-3**). The North Segment includes two Route Options: North 1 (18.1 miles) and North 2 (25.1 miles). Three Segment Alternatives (N9, N10, and N11) were identified in the North Segment (*see* **Appendix D-3**). No Connector Segments were identified in the North Segment.

Figure 3-3 North Segment Overview Map



3.2 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 ROW for the facilities can be located (Minn. Stat. § 216E.01, subd. 8). The ROW is the specific area that is required for the easement for the transmission line. By requesting a Route Width that is wider than the ROW, 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 to the greatest extent practicable.

For this Project, except as otherwise noted below, the Applicants generally request a Route Width of 1,000 feet (500 feet to either side of the Application Alignments) for all proposed Route Options, Segment Alternatives, and Connector Segments, with wider areas around locations with routing constraints. The Applicants are requesting narrower Route Widths at other locations along the proposed Route Options near areas where natural resources and state conservation easements exist, which the Applicants intend to avoid to the greatest extent practicable. For example, in locations near USFWS and MDNR easements, the Applicants narrowed the route width if it was possible to completely avoid the easement. Locations where a wider or narrower Route Width is requested are summarized in Table 3.2-1 and depicted in **Appendix D-1, Appendix D-2,** and **Appendix D-3**. The Applicants generally propose a ROW that is 150 feet wide, located within the requested Route Width. The Commission's practice is to identify an "anticipated alignment" in its Route Permit decision. Accordingly, the Applicants have developed what they currently believe to be the likely ROW alignments for the South, Central, and North Segments 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 "Application Alignments." The Application Alignments may require modifications after a Route Permit is issued because the Applicants have not yet completed detailed survey and engineering work, site review, and design. The Application Alignments that were developed for purposes of evaluating the potential impacts of each proposed Route Option are available on the detailed maps in **Appendix D-1, Appendix D-2,** and **Appendix D-3**. The Applicants identified a proposed location for each route based on the information known at the time of the filing of this Application.

Once the Commission issues a Route Permit with a route and an "anticipated alignment," a final alignment will be developed after discussions with individual landowners and agencies with permitting responsibilities and performing detailed survey and engineering work, site review, and design. The final alignment must be provided to the Commission per the route permit through the Plan and Profile submission and review process. As part of that submission, the Applicants will inform the Commission as to where deviations in the final alignment from the "Anticipated Alignment" occur.

Table 3.2-1 Summary of Route Width Modifications

Subsegment Name[1]	Route Width Modifications		Approximate Route Width (feet)	Approximate Length of Modification (feet)	Reason for Modification
	Modification	Appendix D Reference			
South Segment					
S2	Wider	Appendix D-1 Page 1	Ranges from 800 to 5,700	11,280	Known existing flooding and erosion concerns near existing infrastructure near S2 in the paralleling corridor.
S3	Narrower	Appendix D-1 Page 2	535	680	Avoids USFWS grassland easement.
S5	Wider	Appendix D-1 Page 3	Ranges from 3,200 to 3,420	10,800	Allows for flexibility in final design due to irregular parcel boundaries.
S8	Narrower	Appendix D-1 Page 4	580	2,650	Avoids USFWS fee title land.
	Narrower	Appendix D-1 Page 4	500	1,290	Avoids USFWS grassland easement.
S11	Narrower	Appendix D-1 Page 2	500	2,640	Avoids USFWS grassland easement and USFWS fee title land.
S13	Narrower	Appendix D-1 Page 3	515	1,215	Avoids USFWS wetland easement.
	Narrower	Appendix D-1 Page 3	715	500	Avoids USFWS wetland easement.
	Narrower	Appendix D-1 Page 3	500 to 870	600	Avoids USFWS wetland easement.
S15	Narrower	Appendix D-1 Page 11	630	450	Avoids USFWS grassland easement.
	Narrower	Appendix D-1 Page 11	630	875	Avoids USFWS grassland easement.
Central Segment					
C2	Wider	Appendix D-2 Pages 5 and 6	Ranges from 6,290 to 6,375	23,775	Allows for flexibility in final design due to multiple routing constraints in the area.
C7	Narrower	Appendix D-2 Page 1	550	1,330	Avoids USFWS fee title land.
	Wider	Appendix D-2 Page 1	Ranges from 5,850 to 5,950	18,450	Allows for flexibility in final design due to multiple routing constraints in the area.

Subsegment Name[1]	Route Width Modifications		Approximate Route Width (feet)	Approximate Length of Modification (feet)	Reason for Modification
	Modification	Appendix D Reference			
North Segment					
N3	Narrower	Appendix D-3 Page 3	600	1,325	Avoids USFWS fee title land.
N5	Wider	Appendix D-3 Page 5	Ranges from 1,800 to 3,150	13,600	Multiple landowners and a township board requested additional flexibility for routing in final design.
N6	Narrower	Appendix D-3 Page 6	500	4,025	Avoids USFWS wetland easement.
	Narrower	Appendix D-3 Page 9	485	3,970	Avoids USFWS wetland easement.
	Narrower	Appendix D-3 Page 9	Ranges from 600 to 700	2,500	Avoids USFWS fee title land.
N7	Narrower	Appendix D-3 Page 5	500	6,250	Avoids USFWS wetland easement.
N8	Wider	Appendix D-3 Page 5	Ranges from 1,300 to 1,700	1,485	Flexibility for final design of engineering and substation configuration to tie-in to the substation.

[1]Only portions of the identified Subsegments have route width modifications. Refer to **Appendix D-1, Appendix D-2,** and **Appendix D-3**for the specific portions.

3.3 Right-of-Way

The ROW is the physical land area along the Anticipated Alignment that is needed to construct and operate the energy facility; this is the area that will be maintained by the Applicants.

The Applicants anticipate constructing the new double circuit-capable 345 kV transmission line facilities using structures within a 150-foot-wide ROW. When paralleling existing road ROWs, the Applicants propose to place structures on adjacent private property with an approximately 20-foot offset from the existing road ROW, subject to easements with landowners, as well as road authority design requirements that could affect the offset distance. Structure placement and offset distances may vary in areas such as highway interchanges due to county or state design requirements and in areas of planned future road expansion.

3.4 Transmission Structure and Design Considerations

The transmission line design selected for the Project will be a double-circuit, 345 kV transmission facility that is anticipated to be constructed on steel-monopole

structures. Initially, a single-circuit, 345 kV transmission line, overhead ground wire (OHGW), and optical ground wire (OPGW) for communications, will be installed, with a second, 345 kV circuit to be installed in the future when conditions warrant. Each circuit of the line will consist of three-phase conductors hung vertically from insulators attached to davit arms on each side of the monopole structure. Each phase will have a total of two conductor bundles with 18-inch, vertical spacing.

Examples of typical tangent and deadend structure configurations are provided in **Appendix E**. Tangent structures are expected to be the most common structure along the line route and are used to support the conductors when there is little to no angle between structures. Deadend structures are utilized to support the conductor tension and used at least once every 5 miles or when there are large angles between structures. Due to engineering constraints, tangents structures are generally taller with smaller diameter foundations, whereas deadend structures typically are shorter and are supported on larger foundations.

The phase conductors are expected to be twisted pair (TP), 636 ACSR "Grosbeak." TP conductors consist of two conductors placed side by side and twisted at a predefined distance by the manufacturer. This type of conductor provides motion resistance to wind-induced events on transmission lines (e.g., conductor galloping or vibration) especially during icing conditions. Each phase will consist of two of these TP conductors to provide optimal current carrying capacity at 345 kV.

The initial construction will include installation of OHGW and OPGW at the top of each structure. OHGW is a collection of twisted steel wires while OPGW includes a fiber-optic cable with a designated set of fibers surrounded by steel wires. While OHGW and OPGW both protect the phases from lightning strikes, OPGW allows for the exchange of information (i.e., communicate) between the endpoint substations and other locations on the transmission system.

The Project is expected to have between approximately 525 – 575 transmission structures with spans ranging from 400 to 1,400 feet, but this may vary depending on geological, environmental, or engineering constraints identified during detailed survey and engineering work, site review, and design. Configuration details are provided in Table 3.4-1. The structures will be bolted to concrete, drilled pier foundations embedded in the ground. Foundation sizes vary generally from 7 to 14 feet in diameter and from 25 to 80 feet in depth. Specialty structures such as H-frame, two-pole or three-pole structures may be used where unique features are encountered along the Route, such as crossing roadways or other transmission lines. Examples of the specialty structures proposed for the Project are provided in **Appendix E.**

Table 3.4-1 Project Configuration Summary

Structure Type	Material	Approximate Height Above Ground (feet)	Approximate Structure Base Diameter (feet)	Approximate Foundation Diameter (feet)	Typical Span Between Structure (feet)
Monopole Structure w/ Davit Arms	Corten Steel	120 – 180	5-12	7 – 14	400 – 1,400

The Project 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 maintenance.

3.5 Associated Facilities

Modifications to the existing Alexandria Substation in Minnesota and the Big Stone South Substation in South Dakota will be performed as part of the Big Stone South to Alexandria Project. In addition, a regeneration station for the fiber optic communications path is also expected along the proposed Route. Below is a description of the associated facilities.

3.5.1 Alexandria Substation Expansion

The existing Alexandria Substation, owned by Western Minnesota, is southwest of the City of Alexandria, Minnesota, just south of I-94. 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, reactive power equipment, relays, and associated control equipment. An expansion of approximately two to four acres of the current fenced area will be required to accommodate the new substation equipment and will require the purchase of additional land. The build out of the substation to support the overall Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project will include the Project termination position, so no additional expansion will be required for the Project. These proposed modifications to the Alexandria Substation were included in an Application for Route Permit for a High Voltage Transmission Line for the Alexandria to Big Oaks 345 kV Transmission Project in Central Minnesota filed with the MPUC on September 29, 2023 (MPUC Docket No. TL-23-159) as well as the associated Environmental Assessment.

3.5.2 Big Stone South Substation Expansion

The existing Big Stone South Substation, owned by Otter Tail, is located in Grant County, South Dakota, and is the western endpoint for the Big Stone South to Alexandria

Project. The substation is located approximately one mile west of Big Stone City, South Dakota. The existing ring bus configuration will be modified to a breaker and half configuration by adding one additional row to the 345 kV portion of the substation. This new row will allow for new breaker positions added for the 345 kV line to the Alexandria Substation and additional reactive power equipment. The current fenced area of the Big Stone South Substation will be expanded on Otter Tail-owned property to accommodate this new substation equipment. The Applicants will seek all appropriate permits in South Dakota for the Big Stone South Substation expansion and the portion of the Big Stone South to Alexandria Project that will be located in South Dakota. Proposed modifications to the Big Stone South Substation were included in a Facility Permit Application for the South Dakota portion of the Big Stone South to the Alexandria Transmission Project filed with the SDPUC on April 15, 2024 (SDPUC Docket No. EL24-015).

3.5.3 Regeneration Station

The Project may involve the construction of a new fiber optic Regeneration Station, anticipated to be located within the Central Segment. A Regeneration Station is required to amplify and regenerate optical communications between substations if another communication connection is not available. Regeneration Stations are typically required when the line length exceeds 75 miles. The equipment required to regenerate optical communications will be placed within a small shelter building approximately 15-feet by 25-feet with a height of approximately 15 feet above grade. Currently, the Applicants do not have a proposed location, although it will be installed within the Route Width but may be outside of the ROW depending on the final route selected. The exact location of the Regeneration Station and its permanent access roads will be determined based on the final route and final Project design. The Applicants anticipate a temporary construction workspace of 150 feet by 200 feet (0.69 acre) to construct the Regeneration Station. The Applicants will attempt to locate the Regeneration Station in a previously disturbed area to avoid potential habitats associated with protected wildlife and plant species. It will not be located within delineated wetlands or immediately adjacent to surface water features.

The Regeneration Station would have an approximate final footprint of 100-feet-wide by 100-feet-long (0.23 acre). The entire footprint of the Regeneration Station will be permanently fenced and covered with gravel and may have low wattage flood lighting on the outside of the shelter building for security purposes. Within the final 0.23 acre footprint, the Regeneration Station will include a small shelter building, a 30-foot wide permanent access road, underground 240 volt electrical utilities, and may require equipment for backup power. The Regeneration Station's backup power may be a battery bank or a propane generator that will operate intermittently for monthly maintenance

and during power outages. Since emissions from operation and routine maintenance/testing of the Regeneration Station will only be from propane and vehicle use, the resulting emissions are expected to be nominal. The Regeneration Station will be kept free of vegetation and adequate drainage will be maintained. No water supply is required for construction or operation of the Regeneration Station.

3.6 Project Costs

The Applicants developed an estimate of the Project for the CN application and that cost estimate is still valid for purposes of this Application.

There are several main components of the cost estimate, such as, but not limited to: (1) transmission line structures and materials; (2) transmission line construction and restoration; (3) transmission line permitting and design; and (4) transmission line ROW acquisition.[4] In addition, a risk reserve is also included in the estimate. To calculate an appropriate risk reserve, the Applicants identified potential risks that could result in additional costs. These risks could include, for example: a higher than expected cost of land for acquiring ROW, a higher than expected rate of eminent domain and/or Buy-the-Farm elections (*see* Minn. Stat. § 216E.12, subd. 4), additional mitigations for environmental sensitivities and market fluctuations in material pricing. Once these risks were quantified, they were added to the base project cost to develop a range of costs for the Project.

For the CN application, the Applicants initially included cost estimates in 2022 dollars to be consistent with MISO's estimates approved as part of MTEP21. The Applicants noted that the estimates would 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. On May 28, 2024, the Applicants provided an updated cost estimate based on updates to the design that were not known at the time the CN application was filed as well as increased labor and material costs.

Based on this updated estimate, capital cost of the Project is anticipated to be between $465 million and $535 million (escalated to the anticipated year spend)

[4] Substation costs were included in the CN Application but are not included here, since the substation expansions at the Alexandria Substation and Big Stone Substation are being permitted through other applications. *See* **Sections 3.5.1** and **3.5.2**.

depending on the alignment selected.[5] These costs include approximately $300,000 to $500,000 for establishing a Regeneration Station along the Project. Appendix C contains estimates of the construction-related costs of the Route Options, Segment Alternatives, and Connector Segments included in this Application. Based on historic operations and maintenance costs for other 345 kV transmission lines on their systems, the Applicants anticipate the operational and maintenance costs of the Project to be between $500 and $1,000 per mile annually for routine activities such as line inspections and vegetation management. Actual line specific maintenance costs will depend on a variety of factors, such as repairs and replacements of damaged equipment, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

3.7 Project Schedule

Construction for the Project is expected to begin in 2028. The Applicants anticipate Project construction to be completed in 2030 or 2031. Table 3.7-1 provides a permitting and construction schedule summary, with anticipated dates identified.

Table 3.7-1 Anticipated Project Schedule

Certificate of Need Issued	Q3 2024
Route Permit Issued	Q2 2026
Land Acquisition Begins	Q2 2026
Survey and Transmission Line Design Complete	Q4 2027
Other Federal, State and Local Permits Issued	Q1 2028
Start Right-of-Way Clearing	Q1 2028
Construction Begins	Q2 2028
In-service Date	Q4 2030-Q4 2031

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. Activities such as land acquisition, obtaining the necessary federal, state, or local approvals, material lead times, contractor availability and weather conditions are just some of the variables that could

[5] This cost estimate includes the proposed transmission line and associated facilities included in this Application that will be located in Minnesota. The Alexandria to Big Oaks Route Permit also included an estimated cost of $27.6 million to $32.3 million for the expansion of the Alexandria Substation (*see* MPUC Docket No. E017, ET10/TL-23-160). Additionally, the Applicants' South Dakota Facility Permit Application included estimated costs of $14.2 million to $23.6 million for the expansion of the Big Stone South Substation and an additional $15.5 million to $17.8 million for the new 345 kV transmission line and associated facilities located in South Dakota (*see* SDPUC Docket No. EL24-015).

cause the in-service date of the Project to change. This schedule may be subject to adjustment and revision as further information is obtained.

3.8 Work Force Required

Although the workforce will ebb and flow over the course of the Project depending on the construction sequencing and time of the year, it is anticipated that construction of the Project will employ approximately 100 to 150 construction workers and will last between three and four years. The majority of positions needed during construction of the Project will be contracted and are expected to include, but are not limited to: project management, project assistant, safety supervisors, structure hauling, structure framing and setting, linemen, civil foundation drilling and installation, vegetation maintenance, quality assurance/quality control, construction project management, inspectors, engineers, concrete truck drivers, environmental managers and other on- and off-site support staff. Annual salaries for construction positions are expected to range from approximately $65,000 per year to $135,000 per year depending on the position, past experience and hours worked within the year.

While the majority of the positions will require specialized skills and expertise, some positions (skilled or unskilled) may be filled by qualified individuals from the Project area. Specialized labor may need to come from other areas of Minnesota or from other states, as the relatively short duration of construction makes special training of local or regional labor impracticable. The contractor, who will be responsible for determining employment needs for the construction may develop plans for utilizing and training the existing Minnesota labor market for the specialized positions and the adequacy of the local manpower to meet the temporary labor positions arising from construction of the Project. Additionally, the Applicants have relationships with the Building Trades and will be considering organized labor on the Project, including paying prevailing wages for applicable positions for the construction of the Project.

The construction activities are not expected to create new, permanent jobs, but will provide additional dollars into the local communities, with construction materials purchased from local vendors when practicable. In terms of housing, it is anticipated that the non-local individuals working on the Project will find temporary housing within a daily commuting distance (i.e., 50-mile radius) of the Project. The majority of non-local workers will be housed in nearby hotels and campgrounds. In addition, a portion of the construction workers will likely be local construction personnel and therefore will not require any short-term housing. Beyond housing, other local businesses will also benefit

from the need for fuel, meals, and other associated services that accompany construction activities.

Once the Project is in-service, it is not anticipated that operating and maintaining the Project will create new permanent jobs. Rather, the Applicants will perform operations and maintenance by utilizing existing employees and contracted positions that are performing similar tasks on other projects and similar facilities owned by the Applicants.

3.9 Design Options to Accommodate Future Expansion

Minnesota statutes and rules require the consideration of the potential for a project to accommodate future improvements to the transmission system. As discussed above, the Project includes double-circuit capable structures. Initially, a single-circuit 345 kV transmission line, OHGW, and OPGW will be installed, with the second 345 kV circuit to be added in the future when conditions warrant. As such, the Project is designed to appropriately accommodate future expansion, when needed.

4.0 ROUTE SELECTION PROCESS

4.1 Summary of Route Selection Process and State Routing Criteria

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." Subd. 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 ROW 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 ROWs, survey lines, natural division lines, and agricultural field boundaries;

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

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

K. Electrical 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.
- 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.

The Route selection process involved a number of steps and criteria. As described in **Section 1.0**, the Project was studied, reviewed, and approved as part of the LRTP Tranche 1 Portfolio by the MISO Board of Directors in July 2022. MISO's analysis identified endpoints for the Project. The Applicants conducted a route selection process beginning in 2023 and extending through mid-2024. This process included consideration of statutory and rule requirements; identification and review of opportunities to parallel existing transmission lines, highway ROWs, and other linear infrastructure; information gathering and data compilation; public outreach, including four rounds of in-person open house meetings to collect stakeholder comments, along with agency and Tribal outreach. Considerable public, Tribal, and agency outreach and information gathering were conducted in the larger Project Study Area, as described in **Sections 4.4** and **4.5**.

The Applicants developed and maintained a GIS database of information gathered from publicly available data resources, from in-field routing review efforts, and outreach efforts. This data was used to compare the merits of various routing options with a goal of developing routes that minimize impacts to sensitive resources to the extent practicable. Several existing infrastructure corridors were available and reviewed in the Project Study Area described below. This process resulted in the identification of two

Route Options per Segment, four Segment Alternatives, and three Connector Segments between the Project endpoints presented in this Application. A description of each step in the Route selection process and the identified Route Options is provided below.

4.2 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 (**Figure 1-1**). The Applicants developed the Project Study Area between the two Project endpoints (Alexandria Substation in Minnesota and Big Stone South Substation in South Dakota).

The Project Study Area was large enough for a reasonable number of Route Options that could connect to the Project endpoints. The Project Study Area was refined throughout the routing process as areas were eliminated from consideration using the statutory criteria noted above and stakeholder input received during the public outreach campaign.

The initial Project Study Area extended from the Big Stone South Substation in South Dakota, to east of the City of Benson, Minnesota, and then north to the Alexandria Substation in Minnesota to accommodate the Project's double-circuit capability and align with the Applicants' strategic planning for the system. The Project Study Area is approximately 58 miles by 46 miles as indicated in **Figure 1-1**.

The Project Study Area was also used as the Project notice area for public outreach, developing mailing lists for initial Project updates and invitations.

4.3 Identifying Routing Opportunities and Constraints.

Routing for the Project was an iterative process that evaluated opportunities and constraints to identify and refine the Route Options that are included in this Application. After establishing the Project Study Area, the Applicants identified potential corridors, Route Options, and Route Segments that minimized impacts to humans and the environment as required by Minn. Stat. § 216E.03, subd. 7(a) and subd. 7(b), and Minn. R. 7850.4100. This included identifying routing constraints and opportunities within the Project Study Area that would minimize impacts on the environment and affected landowners and would optimize opportunities. Spatial data was either imported into the Project spatial database or digitized from aerial imagery. Constraints considered during routing were identified using the following data:

- Residences and other buildings: Manually digitized based on aerial imagery.

- Municipal boundaries: The Project crosses the cities of Alexandria, Glenwood, and Ortonville, Minnesota. Other cities within the Project Study Area include Benson, Clontarf, Danvers, De Graff, Holloway, Murdock, Odessa, Correll, Hancock, Farwell, Lowry, Sedan, Cyrus, Long Beach, Villard, Starbuck, Forada, and Kensington.
- Tribally owned properties: There are no lands owned by Tribal governments within the Project Study Area.
- Federally owned and managed properties: USFWS fee title lands, USFWS wetland and grassland easements including Waterfowl Production Areas (WPAs), Historic Landmarks, USDA NRCS floodplain easements, and publicly owned properties that were acquired with federal Land and Water Conservation Act funding.
- State-owned and managed properties: MDNR State Parks, MDNR Wildlife Management Areas (WMAs), Scientific and Natural Areas (SNAs), and Aquatic Management Areas (AMAs), BWSR conservation easements, state-registered scenic byways, state-managed trails, and state historic sites/places.
- Sensitive habitat features: USFWS critical habitat, MDNR sites of biodiversity significance (outstanding, high, moderate, and below), calcareous fens, MDNR rare natural plant communities, MDNR native plant communities, and known raptor nest sites.
- Hydrological features: Lakes, rivers, USFWS National Wetlands Inventory (NWI) wetlands, U.S. Geological Survey's National Hydrography Dataset features, and aquifer information.
- Public land use features: Airports, schools, hospitals, landfills, cemeteries, and places of worship. Regional, county, and municipal parks.
- Center pivot irrigation: Manually digitized based on aerial imagery and from landowner-provided information from the public open houses.
- Existing infrastructure: Railroads; underground utilities; communication towers; and substations.
- Environmental justice communities (based on MPCA's environmental justice mapping tool).

- Listed sites of cultural significance based on information obtained through the SHPO and the Minnesota Office of the State Archaeologist (OSA).

In accordance with routing rules and criteria, the Applicants identified routing opportunities within the Project Study Area that collocated or paralleled existing ROWs, survey lines, natural division lines, and agricultural field boundaries. These routing opportunities were confirmed during public open houses and in written comments received from landowners. Landowners indicated their preference that in agricultural areas, the Project be routed adjacent to existing transmission lines located along field/property lines and to not route the Project by crossing diagonally or through non-field/property lines to avoid impacts to agricultural operations.

Routing opportunities within the Project Study Area included:

- Locations where there was an opportunity to parallel a roadway and potentially share public ROW between the transmission line and road and avoid constraints such as impacts to agricultural operations and fragmenting open landscapes.
- Locations where there was an opportunity to parallel existing transmission lines.
- Locations where there was an opportunity to place the transmission alignment on a field or property line, where impacts to existing land uses would be minimized and could continue uninterrupted in the transmission line easement to the greatest extent possible.
- Routes that reduce the number of angle or dead-end structures by following straight lines.

The Applicants focused initial routing efforts by identifying where Route Options within the Project Study Area would be severely limited or difficult due to existing constraints. These locations were identified and removed from the Project Study Area and were no longer considered for routing. These constraints included the USFWS Big Stone National Wildlife Refuge, the Ortonville airport area, several areas of larger and/or high quantities of waterbodies (e.g., Lake Oliver, Lake Minnewaska, Lake Emily, Red Rock Lake, Lake Oscar, Lake Mary), Kensington Rune State Park and adjacent sensitive habitat features, Glacial Lakes State Park and adjacent sensitive habitat features, and areas with calcareous fens.

The Applicants found that Route Options in the northwest and southeast portions of the Project Study Area were extremely limited by the presence of waterbodies and lakes,

USFWS easements and fee title land, MDNR easements, rare natural and native plant communities and sites of biodiversity significance. As a result, those areas were removed from further routing consideration. **Figure 1-1** illustrates the refined Project Study Area after significant routing constraints were removed.

4.4 Public Open House Meetings

The Applicants conducted a series of four rounds of in-person open houses during which the Applicants described the Project and requested information regarding routing considerations of importance to participants (*see* Table 4.4-1 below). The stakeholder list included state and federal agencies, Tribes, local governmental representatives, and landowners within the Project Study Area (*see* **Appendix F**). The Applicants sent four mailers, in postcard form, providing notification of each of the open houses to landowners, Tribal leaders, government agencies, and stakeholders informing them about the Project and engagement opportunities. Using parcel information obtained from counties, the Applicants sent over 85,000 mailers for the four rounds of open houses. Additionally, emails were sent to approximately 365 stakeholders and landowners on the Applicants' email distribution list to invite them to the third and fourth rounds of in-person opportunities. Open house notices were also placed in the local newspapers. Refer to **Appendix G** for mailed letters and newspaper ads.

- The first round of open houses was held in April 2023, at which the Applicants introduced the Project Study Area, answered questions, and collected early input from landowners and stakeholders. A total of 144 people attended.
- The Applicants then refined the Project Study Area into project corridors and held the second round of open houses in October 2023, at which the Applicants provided updated information on the Project and collected further feedback to identify further routing constraints and opportunities. A total of 104 people attended.
- The Applicants further refined the project corridors into route corridors and held the third round of open houses in February 2024 where a total of 301 people attended.
- The Applicants further refined the route corridors into proposed route options and held a fourth round of open houses in June 2024. A total of 246 people attended.

Table 4.4-1 summarizes the locations and dates of each public open house.

Table 4.4-1 Public Open House Summary

Open House Venue	Location	Date	Time
First Round – April 2023			
Holiday Inn Alexandria	Alexandria, MN	April 25, 2023	4:00-7:00 p.m.
Community Center	Ortonville, MN	April 26, 2023	4:00-7:00 p.m.
McKinney's on Southside	Benson, MN	April 27, 2023	4:00-7:00 p.m.
Second Round – October 2023			
Milbank Community Room	Milbank, MN	October 16, 2023	3:00-6:00 p.m.
Benson Golf Club	Benson, MN	October 17, 2023	3:00-6:00 p.m.
Central Square	Glenwood, MN	October 18, 2023	3:00-6:00 p.m.
Broadway Ballroom Events	Alexandria, MN	October 23, 2023	3:00-6:00 p.m.
Ortonville Community Center	Ortonville, MN	October 24, 2023	3:00-6:00 p.m.
Third Round – February 2024			
Community Center	Ortonville, MN	February 12, 2024	3:00-6:00 p.m.
Holiday Inn	Alexandria, MN	February 13, 2024	3:00-6:00 p.m.
Central Square	Glenwood, MN	February 20, 2024	3:00-6:00 p.m.
New American Legion	Big Stone City, SD	February 21, 2024	3:00-6:00 p.m.
McKinney's on Southside	Benson, MN	February 22, 2024	3:00-6:00 p.m.
Fourth Round – June 2024			
Broadway Ballroom	Alexandria, MN	June 24, 2024	3:00-6:00 p.m.
Central Square	Glenwood, MN	June 25, 2024	3:00-6:00 p.m.
Benson High School	Benson, MN	June 26, 2024	3:00-6:00 p.m.
Sioux Historic Pavilion	Ortonville, MN	June 27, 2024	3:00-6:00 p.m.

The goal of each open house was to provide Project information and gather input from the public to assist the Applicants in developing the Route Options. The open houses had several stations to display and communicate important Project details to the attendees. Attendees could identify their property on large poster-sized route maps and Project staff provided a description of the Project and the current state of the Applicants' routing efforts. Materials available at each open house included a Project overview handout, tabletop maps, map exhibit boards, comment forms, and an interactive GIS mapping station. Additionally, materials from the in-person open houses were uploaded to the Project website. Information packets were available to those who were not able to attend the open houses or requested them. During and after the open house meetings, formal and informal comments were collected and considered in developing the Route Options included within this Application.

4.5 Initial Tribal, Agency and Local Government Outreach

Following development of the Project Study Area, meetings were held with federal, state and local agencies (e.g., USFWS, MnDOT, MDNR, and various county and local

administrators). The purpose of these meetings was to gather feedback on the routes and identify potential concerns. More details of the discussions with Tribes and federal, state and local agencies may be found in **Section 8** of this Application.

4.6 Route Refinement Analysis

Project routing was an iterative process using information from the public open house meetings; Tribal, agency, and local government outreach; field visits; and desktop reviews. Opportunities and constraints were identified as data was continuously collected, built upon, and refined. The Project Study Area was first refined into Project Corridors based on the ongoing data collection and discussions with agencies and the public. The Project Corridors were then refined into Route Corridors which were presented during the third round of open house meetings in February 2024.

Following the third round of open house meetings in February 2024, the Applicants reviewed potential Route Options within the Route Corridors. To identify which Route Options had more constraints and less opportunities when compared to others, data for the route combinations were quantified for evaluation. Routes Options that were identified as having significantly more impacts than others were excluded from further analysis (e.g., routes that crossed a larger number of federal and state lands, routes that came in proximity to significantly more homes than other routes, and routes that did not parallel as much existing linear infrastructure). Specific route alternatives which were considered but not included in the final proposed routes are shown and discussed in **Appendix H**.

The Applicants then identified various pinch points to analyze Route Options by Segments. After identifying Route Options between the Segments, proposed Route Options were selected for detailed analysis. **Section 5.0** below describes the Route Options (*see also* **Section 3.1** for a summary of Route Options).

5.0 DESCRIPTION OF ROUTE OPTIONS

As described in **Section 3.1**, the Project includes three overall routing Segments: South Segment, Central Segment and North Segment. Within each segment, there are two end-to-end routes comprised of Subsegment combinations (Route Options). **Figure 1-1** depicts the Route Options.

In addition to the end-to-end Route Options, Segment Alternatives and Connector Segments are also included in this Application. Connector Segments are included to provide opportunities to shift between Route Options. Segment Alternatives are typically included in locations where landowners or agencies requested alternatives to the Route Options to avoid certain constraints, and where the alternatives had approximately comparable, but different, impacts. Descriptions of Segment Alternatives and Connector Segments are presented in the following sections. A comparison analysis of the Segment Alternatives with the corresponding portion of a Route Option is included in **Appendix I**.

5.1 South Segment

The South Segment has two Route Options (South 1 and South 2). One Alternative Segment was identified for Route Option South 2 and two Connector Segments were identified, which are described below. The west end of the South Segment originates at the Minnesota/South Dakota border, where the South Dakota portion of the Project ends and the Minnesota portion begins, approximately one mile south of Ortonville, Minnesota, and continues east to a point in Tara Township, Swift County, Minnesota, approximately ten miles northwest of the City of Benson, Minnesota. *See* **Figure 3-1**. The South Segment lengths range from approximately 38.8 to 41.9 miles.

Table 5.1-1 below lists subsegments that together comprise Route Options South 1 and South 2 which are the end-to-end Route Options for the South Segment. The table also lists the Segment Alternatives and Connector Segments that are being proposed within the South Segment.

Table 5.1-1 South Segment Components

South Segment			
Route Option (complete end-to-end route)	**Subsegments Included**	**Segment Alternatives**	**Connector Segments (transition from one Route Option to another)**
South 1	S1, S2, S3, S4, S5, S6, S7, S8, S9	None	S16 (transition to/from Route Option South 1 to/from Route Option South 2) S17 (transition to/from Route Option South 1 to/from Route Option South 2)
South 2	S1, S10, S11, S12, S13, S6, S14, S15, S9	S18 (in place of S14)	

5.1.1 Route Option South 1

No Alternative Segments were identified for Route Option South 1 and two Connector Segments were identified, which are described below. From the Minnesota/South Dakota border, Route Option South 1 follows Big Stone County Road 15 north and then parallels an existing HVTL, crossing the Minnesota River and US Highway 75 (developed in coordination with MDNR), to 715th Avenue in Ortonville Township where the Route Option continues east on quarter section lines to 680th Avenue in Odessa Township where it turns south for 1.0 mile to provide more distance from the USFWS Hillman Wetland Management Area. It then turns east at the quarter section line for 6.0 miles until it intersects with 620th Avenue in Akron Township where it turns north for 2.0 miles while also paralleling an existing HVTL. It then turns east, staying parallel within a 0.5 mile of US Highway 12 for 16.0 miles, crossing the Pomme de Terre River. It then turns north at 150th Ave SW for 0.5 mile, then east on 20th St SW for 1.0 mile, and north to parallel 140th Avenue NW (township line) for 6.0 miles. It then turns east and parallels 60th Street NW in Tara Township for 2.0 miles where Route Option South 1 ends and the Route Options in the Central Segment begin. Route Option South 1 traverses mostly agricultural land. *See* **Figure 3-1**.

5.1.2 Route Option South 2

One Alternative Segment was identified for Route Option South 2 and two Connector Segments were identified, which are described below. From the Minnesota/South Dakota border, Route Option South 2 traverses east for approximately 0.8 mile (developed in coordination with the landowner) where it then angles northeast to cross the Minnesota River and US Highway 12 until it meets a section line, goes north 0.15 mile, then east on 715th Ave/430th Street in Ortonville Township. It follows the section line east for approximately 6.5 miles until the quarter section line 0.5 mile east of 660th Avenue in Odessa Township where Route Option South 2 turns north for

approximately 1.0 mile. Route Option South 2 then parallels US Highway 12 for approximately 3.5 miles east until it turns north and shares a 0.5-mile segment of Route Option South 1, parallel to 620th Avenue in Akron Township. Route Option South 2 continues north along 620th Avenue for another 5.5 miles, paralleling the same existing HVTL along 620th Avenue for 6.5 miles, where it turns east for 4.0 miles on approximately quarter sections lines 0.5 mile north of 360th Street in Artichoke Township. It then turns south for approximately 0.5 mile on 260th Avenue NW, again paralleling an existing HVTL, to 60th Street NW in Hegbert Township for approximately 12.0 miles, crossing the Pomme de Terre River. It continues east on 60th Street NW in a common segment with Route Option South 1 for an additional 2.0 miles where Route Option South 2 ends and the Route Options in the Central Segments begin. Route Option South 2 traverses mostly agricultural land. *See* **Figure 3-1**.

5.1.3 Alternative Segment S18

Route Option South 2 includes an approximately 2.4-mile-long Segment Alternative S18, which is provided as an alternative to Subsegment S14 to avoid four additional homes. This Segment Alternative parallels Route Option South 1 along the quarter section line of Section 9 in Akron Township for 0.5 mile, then turns north, crossing agricultural land for approximately 1.5 miles, then turns west and parallels Township Road 155 until it rejoins Route Option South 2 at the intersection of Township Road 155 and 620th Avenue. *See* **Figure 3-1**.

5.1.4 Connector Segment S16

The South Segment includes an approximately 0.5-mile-long Connector Segment S16. The connector travels north-south between Route Option South 1 and South 2 along the section line between Sections 14 and 15 in Ortonville Township, crossing entirely agricultural land. *See* **Figure 3-1**.

5.1.5 Connector Segment S17

The South Segment also includes an approximately 0.5-mile-long Connector Segment S17. The connector travels north-south between Route Option South 1 and South 2 along a quarter section line in Section 23 of Odessa Township, crossing entirely agricultural land. *See* **Figure 3-1**.

5.2 Central Segment

The Central Segment has two Route Options (Central 1 and Central 2). No Alternative Segments were identified for either Route Option, and only one Connector Segment was identified, which is described below. From the end of the South Segment to

the south end of the North Segment, the Project would continue east, northeast to a point in Ben Wade Township approximately four miles north of the City of Starbuck, Pope County, Minnesota (**Figure 3-2**); this portion is the Central Segment. The Central Segment lengths range from approximately 34.4 to 38.5 miles.

Table 5.2-1 below lists subsegments that together comprise Route Options Central 1 and Central 2 which are the end-to-end Route Options for the Central Segment. There are no Alternative Segments identified for either Route Option. The table also lists the Connector Segment that is being proposed within the Central Segment.

Table 5.2-1 Central Segment Components

Central Segment			
Route Option (complete end-to-end route)	**Subsegments Included**	**Segment Alternatives**	**Connector Segments (transition from one Route Option to another)**
Central 1	C1, C2, C3, C4, C5, C6	None	C11 (transition to/from Route Option Central 1 to/from Route Option Central 2)
Central 2	C7, C2, C8, C9, C10, C6	None	

5.2.1 Route Option Central 1

No Alternative Segments were identified for Route Option Central 1, and one Connector Segment was identified, which is described below. Route Option Central 1 begins where the South Segment ends, in Tara Township, Swift County, Minnesota, and travels north, paralleling 120th Avenue NW, crossing into Stevens County after approximately 2.0 miles where 120th Avenue NW ends but the section line continues as Township Road 7 (TR 7). From the county line, it continues north for another approximately 6.0 miles on TR 7 through agricultural land and turns east, paralleling County Highway 8, which is approximately 0.1 mile to the east of the City of Hancock, and turns north west of Hancock along a farmed-over section line that eventually becomes 430th Ave. Central 1 continues north for approximately 2.5 miles then proceeds to head east at 250th Street where it parallels an existing HVTL for approximately 1.5 miles, then turns north for 2.0 miles on the quarter section lines of Sections 14 and 11 of Hodges Township.

Route Option Central 1 then turns east and parallels 230th Street for 2.5 miles as it crosses into Pope County at 400th Avenue, where 230th Street turns into County Road 18 in Pope County. The segment of Route Option 1 from Section 14 to where the route option turns north from County Road 18 is a common segment with Route Option Central 2 and is the only Route Option in this location.

From the intersection of County Road 18 and 390th Ave, Route Option Central 1 then heads north, east, and north, again following township roads, section lines, and quarter section lines. As it heads east on 210th Street, it crosses the Chippewa River. It heads north along County Road 1 where it crosses State Highway 28, continues east, north, and east again to cross the Little Chippewa River while paralleling County Road 24. Along County Road 24, the Central 1 Route meets with the Central 2 Route and they both terminate at the same point in Ben Wade Township, north of Malmedal Lake, approximately four miles north of the City of Starbuck. *See* **Figure 3-2**.

5.2.2 Route Option Central 2

No Alternative Segments were identified for Route Option Central 2, and one Connector Segment was identified, which is described below. Route Option Central 2 begins where the South Segment ends in Tara Township, Swift County, Minnesota, and travels east along 60th Street NW, paralleling an existing HVTL for approximately 4.5 miles. It then heads north along a quarter section line for 8.0 miles to avoid impacting a number of center pivot irrigation systems and to avoid homes along roads. As it traverses north, it crosses the border into Pope County, then crosses State Highway 9. Approximately 2.5 miles east of the City of Hancock, Route Option Central 2 turns west on Township Road 295 for 1.0 mile, crossing into Stevens County, then North 1.4 miles from Hancock along a quarter section line for 3.0 miles. It heads west at 250th St for 1.0 mile where it meets with Route Option Central 1 and both route subsegments are a common segment in this location.

Where Route Option Central 1 and Central 2 are common, the routes head north at a quarter section line in Section 14 of Hodges Township, Stevens County, Minnesota, for 2.0 miles, and east along 230th St for 2.5 miles, crossing into Pope County.

From the intersection of County Road 18 and 390th Ave, the two subsegments split again and Route Option Central 2 continues east along County Road 18 for 2.5 miles, crossing the Chippewa River for the first time. Route Option Central 2 heads north at County Road 1 for 2.0 miles, crossing the Chippewa River a second time, then east on 210th St for 2.0 miles, and north on 340th Ave for 2.5 miles. Route Option Central 2 then follows a quarter section line east for 2.5 miles, turning north at another quarter section line for 1.5 miles to intersect with Route Option 1 at County Road 24. The Central 1 and Central 2 Routes are the same from this point and both terminate at the same point in Ben Wade Township, north of Malmedal Lake, approximately four miles north of the City of Starbuck. *See* **Figure 3-2**.

5.2.3 Connector Segment C11

The Central Segment includes an approximately 1.5-mile-long Connector Segment C11. The connector travels east-west between Route Option Central 1 and Central 2 along a quarter section line paralleling 180th Street to the north and 190th Street to the south, crossing 350th Avenue in Sections 14 and 13 in New Prairie Township of Pope County, crossing entirely agricultural land. *See* **Figure 3-2**.

5.3 North Segment

The North Segment has two Route Options (North 1 and North 2). Two Alternative Segments were identified for Route Option North 1, and one was identified for Route Option North 2, further described below. No Connector Segments were identified due to the distance between the Route Options and the existing constraints between them. From the north end of the Central Segment, Project routing continues east and northeast to the existing Alexandria Substation located southwest of the City of Alexandria, Minnesota, and adjacent to I-94. The North Segment lengths range from approximately 18.1 to 25.1 miles long.

Table 5.3-1 below lists subsegments that together comprise Route Options North 1 and North 2 which are the end-to-end Route Options for the North Segment. The table also lists the Segment Alternatives that are being proposed within the North Segment.

Table 5.3-1 North Segment Components

North Segment			
Route Option (complete end-to-end route)	**Subsegments Included**	**Segment Alternatives**	**Connector Segments (transition from one Route Option to another)**
North 1	N1, N2, N3, N4, N5	N9 (in place of N2) N10 (in place of N4)	None
North 2	N6, N7, N8	N11 (in place of N7)	

5.3.1 Route Option North 1

Route Option North 1 begins where the Central Segment ends in Ben Wade Township, Pope County, approximately four miles north of the City of Starbuck. Route Option North 1 proceeds north along the quarter section line between 300th Ave and 290th Ave for approximately 4.5 miles, including crossing State Highway 55. It turns east at County Road 76 for 1.0 mile, north at a quarter section line for 1.0 mile, east for 0.25 mile along the county line between Pope and Douglas Counties, Minnesota, and then crosses into Douglas County going north on Iris Ln SW for 1.0 mile. It continues east along a section line for 2.75 miles, north along a quarter section line for 1.5 miles, east for 0.5

mile, and then north in Lake Mary Township for 1.0 mile where it parallels County Road 21 SW between Andrew Lake, Mud Lake, and Lake Mary. From this pinch point, the route traverses east immediately north of Mud Lake for 0.24 mile and north for 1.7 miles until Woodsman Lane SW/Cross Country Lane SW. From there, it turns east, along the road for 1.7 miles, crossing into the City of Alexandria municipal limits, then north along Sunfish Drive/Waterfowl Drive SW where it exits the municipal limits to terminate at the Alexandria Substation. The Alexandria Substation is located adjacent to I-94 and, although it is not within the municipal limits of the City of Alexandria, it is surrounded by it.

5.3.2 Route Option North 2

Route Option North 2 begins where the Central Segment ends in Ben Wade Township, Pope County, approximately four miles north of the City of Starbuck. Route Option North 2 proceeds east along the quarter section line between 150th Street and 160th Street, which turns into 155th Street, for 8.0 miles. It crosses State Highway 55 just outside of the City of Glenwood and then continues north along the quarter section line of State Highway 29 and 210th Avenue for 2.0 miles, then east for 1.5 miles and north for 3.0 miles. It continues east on a quarter section line for 1.0 mile and then north for 2.5 miles, crossing into Douglas County on a section line west of County Road 30. It continues west for one mile towards Maple Lake and the Town of Forada along a section line between Country Road 4 SE and Nash Road SE and then continues north for 0.75 mile. Route Option North 2 turns west on a quarter section line for 0.75 mile just north of the City of Forada. At this point the Route Option North 2 begins paralleling County Road 87 SE and the Soo Line Canadian Pacific railroad for approximately 1.3 miles generally northwest. It then turns west for 0.5 mile, and north for 1.5 miles along a quarter section line before then turning west to parallel an existing HVTL for 1.4 miles into the Alexandria Substation.

5.3.3 Segment Alternative N9

Route Option North 1 includes an approximately 3.0-mile-long Segment Alternative N9, which is provided as an alternative to Subsegment N2 due to routing constraints at the State Highway 55 crossing. Segment Alternative N9 runs east, perpendicular to Route Option North 1 along a quarter section paralleling 130th Street to the north, then turns north, parallels State Highway 114, and turns northwest to span State Highway 55 perpendicularly. It then continues north, generally parallelling State Highway 114 until it rejoins Route Option North 1 near the intersection of State Highway 114 and County Road 76.

5.3.4 Segment Alternative N10

Route Option North 1 includes an approximate 2.1-mile-long Segment Alternative N10, which is provided as an alternative to Subsegment N4, in Lake Mary Township, Douglas County, Minnesota. This alternative was proposed to avoid the pinch point paralleling County Road 21 SW between waterbodies and several homes. Segment Alternative N10 starts at County Road 21 SW and runs east for 0.5 mile along a quarter section paralleling County Road 4 SW to the north, turns north and continues generally parallel to County Road 21 SW, follows a tree line, spans Mud Lake, and then turns west to rejoin Route Option North 1.

5.3.5 Segment Alternative N11

Route Option North 2 includes an approximate 2.0-mile-long Segment Alternative N11, which is provided as an alternative to Subsegment N7, in Hudson Township, Douglas County, Minnesota. This alternative was proposed to avoid spanning several gravel pits and to parallel the Soo Line Railroad and existing HVTL for a longer duration. Segment Alternative N11 starts at County Road 87 SE and continues north to parallel County Road 87 SE and the Soo Line Railroad where the Route Option North 2 turns west. This alternative continues north for 1.4 miles and then turns west to parallel an existing HVTL and continues paralleling the HVTL until it rejoins Route Option North 2.

6.0 RIGHT-OF-WAY ACQUISITION, CONSTRUCTION, RESTORATION, AND OPERATION AND MAINTENANCE

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

6.1 Landowner Coordination and Right-of-Way Acquisition

The Applicants have initiated landowner outreach by providing information on the Project via public open house meetings, with letters mailed to potentially affected landowners along the Route Options as well as other stakeholders, along with letters mailed to federal, state, and local governmental officials. (**Section 8.0**, **Appendix F**). The Applicants will continue to engage with landowners throughout the permitting process to learn more about each landowner's property and property-specific matters to be considered during acquisition, construction, and maintenance of the Project, and, more generally, to be a resource for landowners regarding the easement acquisition process and for obtaining information about the Project.

The early stages of landowner coordination and outreach may also involve survey agreements to access property as part of early transmission design work, so that the Applicants are able to complete preliminary survey work and acquire other property-specific data (e.g., soil characteristics).[6] The Applicants will work with landowners regarding any agreements necessary for this early/preliminary work. This work will also help the Applicants and landowners to work together to identify any site-specific characteristics that should be accounted for in the Project's design.

The land within the majority of the Route Options is owned by private landowners. New transmission easements will be needed for the 345 kV transmission line route. Applicants' representatives will work directly with individual landowners to negotiate the necessary easements. The Applicants expect that the Project will obtain a total ROW width of 150 feet for the transmission line (75 feet on each side of the Application Alignment) in most circumstances. In certain circumstances, specifically where extra-long spans are required or if paralleling road ROW, the Applicants may have to increase or decrease the total ROW width. Where the transmission line parallels roads, the transmission line structures are typically installed proximate to, but outside of road ROW.

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

During the easement acquisition process, the Applicants will provide the landowners a draft transmission easement, an offer of compensation for the easement, and information regarding the Project schedule, the Applicants' construction practices, vegetation removal, and construction/crop damages compensation/reimbursement approach. Additional information may also be given to each landowner regarding preliminary structure placement (if available at that time), structure design, and power line safety. Applicant representatives would also respond to any comments or questions landowners may have including those with respect to the transmission line construction practices, operations or ongoing maintenance of the transmission line.

In addition to transmission easements needed to build and operate the transmission facilities, agreements may be obtained from certain landowners for additional access and/or temporary construction or staging areas for storage of poles, vehicles, or other related items.

Sometimes a landowner and a Project developer are unable to reach a voluntary or negotiated easement agreement. In those cases, public service corporations, such as the Applicants, may exercise the right of eminent domain pursuant to Minnesota law. The judicial process of exercising the right of eminent domain is called condemnation. Minnesota's condemnation laws are well-developed and provide a clear framework for the determination of issues such as the Applicants' eminent domain authority as well as how the amount of just compensation—the amount a landowner is entitled to receive for rights the Applicants acquire by condemnation—is determined. The process typically involves independent valuation experts, a presentation of each side's evidence, and a decision by court-appointed commissioners (who are knowledgeable in real estate issues) as to the amount of just compensation that the Applicants are required to pay. Often times, settlement agreements are reached shortly after a condemnation action is started, or at some other point during the action. In those cases, the condemnation actions are often dismissed. The Applicants and their representatives will look for opportunities to resolve easement acquisition in a voluntary manner at all stages of the Project.

Because the Project involves transmission lines greater than 200 kV, Minnesota law provides that qualifying landowners may elect to have certain portions of their land acquired by the Applicants in fee as opposed to the easement sought by the Applicants. The law, known as the "Buy-the-Farm Statute" is in Minn. Stat. § 216E.12, subd. 4, and it provides certain procedures specific to the making of an election by a landowner, deadlines for the Applicants to either accept or object to such an election, and a process and timelines for the district court to decide whether an election is valid or not when it is disputed. The measure of compensation for acquisition of a landowner's fee interest is

different than for acquisition of easements, but the process of reaching those valuation determinations—by court-appointed commissioners and then by a jury or judge in the event of an appeal—are substantively the same as the condemnation process described above. In addition, landowners who make Buy-the-Farm elections that are accepted as valid by Applicants or ruled valid by the district court may receive other rights or benefits applicable under Minn. Stat. Ch. 117.

6.2 Construction Procedures

As described further below, construction will follow the Applicants' standard construction and mitigation best practices. After land rights have been secured and prior to any construction activities starting, landowners will be notified of the Project schedule and other related construction activities. Construction of an overhead transmission line typically occurs as follows:

- Installation of erosion control at specific location and implementation prior to anticipated ground disturbance.
- Surveying and staking will be used throughout multiple phases of the Project.
- Collection of geotechnical data (soil borings) required for final design of the transmission line foundations.
- Mobilization and preparation of material laydown yards.
- Clearing activities of the ROW.
- Construction matting will be installed to provide access through wetlands or other unstable soil areas prior to construction, if needed.
- Temporary material staging along the ROW prior to construction initiating.
- Foundation installation and/or excavation depending on the type of foundation.
- Structure or pole setting.
- Wire stringing and clipping once there are enough structures set consecutively in a row to support a wire pull.
- Cleanup and restoration of ROW.
- Demobilization and laydown yard cleanup and restoration if required.

During construction of an overhead transmission line, several different work functions happen concurrently at any given location. The following information generally describes the major construction activities, their approximate sequence, typical construction machinery used, and the anticipated impacts associated with each activity:

Erosion Control – Installation of erosion and sediment control Best Management Practices (BMPs) are location specific and will be implemented prior to anticipated ground disturbance and in accordance with the MPCA NPDES Construction Stormwater General Permit. Where unexpected ground disturbance occurs, BMPs are installed prior to or immediately after the disturbance occurs. Typical erosion control equipment includes all-terrain vehicles (ATVs) and trucks for crew transportation, as well as skid loaders, tractors, backhoes, hydro-seeders, and other light-duty equipment.

Surveying and Staking – Surveying and staking will be used throughout multiple phases of the Project. Some examples are surveying and staking for locating and marking the ROW, environmentally sensitive boundaries, foundations or structure locations, property or section lines, underground and above ground utilities, etc. Surveying and staking will be performed prior to and sometimes after construction activities such as constructability reviews, soil borings, laydown yards, clearing, and foundation excavations. The surveying and staking activities have very limited impact on the environment or landowners and are generally completed by a two-person crew travelling by foot, ATV, or pick-up truck.

Mobilization and Preparation of Laydown Yard – Initially, labor and equipment will be mobilized to prepare laydown yards for temporary trailer(s) and security measures to receive materials, storage containers, portable toilets, dumpsters, construction mats, tools, and equipment, etc. Activities involved to prepare the laydown yard include installation of erosion control and sediment BMPs, any leveling of uneven surfaces, stripping and stockpiling of topsoil (if necessary), and installation of gravel, tracking pads near entry/exit, if needed, installation of culvert(s), power and fencing. This work is generally completed using equipment such as a dozer and dump trucks. The disturbance from the laydown yard is dependent on size, soil type and topography.

Clearing of ROW – To facilitate construction equipment access, ensure safe clearances between vegetation and the transmission line, and to maintain compliance with North American Electric Reliability Corporation (NERC) reliability standards and NESC standards, the Project ROW will be cleared of vegetation as necessary to construct, operate, and maintain the Project. Vegetation will be cut at or slightly above the ground surface using mechanized mowers, sky trims, processors, harvesters, or by hand. Rootstocks will generally be left in place, except in areas where stump removal is

necessary to facilitate the movement of construction vehicles, or when reasonably requested by the landowner. Side trimming the ROW would happen shortly after the clearing is completed. Following the side trimming, a final mowing of debris and stump cleanup will be completed. Where permission of the landowner has been obtained, stumps of tall-growing species will be treated with an herbicide to discourage re-growth. Trees that could present a danger to the safe operation of the Project will also be removed or pruned to ensure safety and maximize reliability, including trees outside of the Project ROW that could hit the transmission line should they fall.

Construction Matting – Matting will be used as a protective measure to minimize ground impacts. Mats are also used to support and stabilize large equipment required for construction. Mats provide a safe and solid temporary access path, which can reduce downtime and costly delays due to weather or difficult terrain. Matting will be installed to provide access through wetlands or other unstable soil areas prior to construction. In addition, permitted temporary clear span bridges (TCSBs) will be installed over waterways if necessary. Construction matting may consist of timber, composite, or hybrid timber mats, and will be installed with rubber-tired grapple trucks, forwarders, forklifts, or skid loaders. Mat access roads may be up to 30 feet wide, and mat work platforms may be as large as 150 feet by 200 feet, depending on the type of structure. Wire stringing areas or wire pulling areas are estimated to be approximately 200 feet by 700 feet. At a minimum, at each wire pulling area, matting will be placed under wire equipment for construction grounding purposes. If a wire stringing location is in a wetland, additional matting will be needed to provide a stable area for the stringing equipment. Matting will be removed by similar equipment used for installation as each wire pull or construction segment is completed.

Temporary Material Staging – Besides storing materials at the laydown yard, there will be temporary staging of materials such as structures and hardware along the ROW prior to construction installation. This work involves such equipment as semi-trucks, loaders, and forklifts to unload structures and other materials near each work location.

Foundation Installation and/or Excavation – In general, the excavated holes for each type of steel structure would range from 7 to 14 feet in diameter and 25 to 80 feet in depth, depending on soil conditions. The method of installation, diameter and depth of the foundation will vary depending on the soil conditions and structure loadings. Excavation is required for all structures. Top soils from the foundation drilling will be separated and stockpiled on-site and spoils will be hauled offsite. BMPs will be implemented as necessary to prevent soil run-off or mixing of the topsoil and subsoil. All

structures are expected to be reinforced concrete drilled pier foundations unless unusual soil conditions require different types. In areas where groundwater seeps into the excavation, or where water is needed to hold the hole during drilling, it may be necessary to dewater the excavation. Depending on site conditions, the water may be de-silted and discharged to an upland area where it is allowed to re-infiltrate or removed from the site via a tank truck. Dewatering will proceed in accordance with applicable regulations and permit requirements.

Drilled pier reinforced concrete foundations will be excavated and a rebar cage and anchor bolts will be placed into the excavation. The excavation will then be filled with concrete to a point where the rebar cage and anchor bolts are covered leaving a typical two to three-foot reveal of the foundation above grade with exposed threaded anchor bolts. The complete foundation will then be allowed to cure. Typical equipment for this phase of construction includes dump trucks, drill rigs, cranes, vacuum trucks, concrete mixers, and tanker trucks.

Structure setting – Steel pole structures with base plates are placed on the foundation anchor bolt pattern, leveled, and tightened down. After that, the top section or sections will be installed. At each section, hydraulic jacking systems are typically used to slide the joints together to the engineered and fabricated tolerances. Equipment used for this phase of construction would include cranes and bucket trucks at each structure location.

Wire stringing and clipping – Once there are a sufficient number of structures set consecutively in a row to support a wire pull, the equipment for the wire pull is mobilized to the pull area and is set up. The conductor, OHGW and OPGW are then pulled and clipped into place. This stringing and clipping activity requires access to each structure with a bucket truck, crane, or helicopter. Other handling equipment used for this phase of construction includes reel trailers, wirepullers, and related stringing equipment. The approximate size of the wire stringing/clipping areas is expected to be 200 feet by 700 feet.

Relocation of Existing Facilities – Where replacing, overbuilding, or burying existing distribution lines, the existing structures and wire will be removed. The removed materials will be evaluated to determine their appropriate disposal. Typical equipment used to remove these existing facilities includes cranes, bucket trucks, reel trailers, wirepullers, and related stringing equipment. The determination of the necessary equipment will be site specific and will be based on the type of structure, land use at the site, and construction vehicle access constraints.

Cleanup and Restoration of ROW – Upon completion of construction, cleanup and site restoration occurs. This includes removing construction mats, TCSBs, and other material or debris from the ROW. Any necessary seedbed preparation and seeding is performed in accordance with BMPs and the draft Vegetation Management Plan (VMP) (**Appendix J**). Typical equipment used for these activities include mat trucks, skid steers, pickup trucks, and other light-duty vehicles.

Demobilization and Laydown Yard Cleanup – The last step in the construction process is final cleanup of the laydown yard by removing all items such as trailers, security fence, left over materials, storage containers, portable toilets, dumpsters, construction mats, tools, and equipment from the Project site. Once the final laydown restoration is complete the construction phase is complete.

6.3 Restoration Procedures

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

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

The Applicants will work to ensure that restoration activities are completed in accordance with easement agreements and applicable permitting requirements. If damage has occurred to crops, fences, or the property, the Applicants will compensate the landowner. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition in accordance with the easement agreement.

6.4 Operations and Maintenance

Once the Project is operational, access to the Project ROW is required periodically to perform inspections, conduct maintenance, and repair damage. Regular maintenance and inspections will be performed during the life of the Project to ensure it continues to provide safe and reliable performance. The Applicants will perform maintenance of the Project in compliance with the applicable reliability standards established by NERC. Generally, the Applicants inspect the transmission line at least once per year. Inspections

are typically limited to the immediate Project ROW by utilizing pre-determined access points. Inspections may occur via ground patrol or by performing aerial inspections with the use of drones. If concerns or problems are found during inspections, repairs will be performed and the landowners and agencies will be notified, as needed.

The Project ROW will be managed to remove trees and vegetation that interfere with the safe and reliable operation of the transmission line. The Applicants' VMP is provided in **Appendix J**. As stated in the VMP, the Applicants' long-term goal of the vegetation management maintenance program is to establish a sustainable ROW consisting of low-growing vegetation that would be considered compatible. Trees along the ROW edge will need to be trimmed from time to time to manage the appropriate clearance distances between the conductors and the trees. To ensure continued safe operation of the line, vegetation that could present a danger to the safe operation of the Project will also be removed or pruned to ensure safety and maximize reliability, including hazardous trees outside of the Project ROW that could hit the transmission line should they fall.

Integrated vegetation management practices are utilized within the Applicants' vegetation management program to establish the long-term goals of the program. The Applicants will use many control methods within their vegetation management maintenance program that vary based on site conditions and can include manual (chainsaws), mechanical (mowers and other specialized vegetation management equipment including aerial saws where appropriate) and herbicides.

Herbicides may be used within the ROW to control regrowth of woody species, prevent the re-sprout of the stumps of tall-growing tree species, or to control invasive or noxious weed species. Herbicide application methods utilized will vary based on vegetation density, size and location, time of year, environmental conditions and property owner or easement restrictions. Through the easement acquisition process, landowners can give or decline permission for herbicides on their property.

Implementation of integrated vegetation management practices help to minimize the impacts of future vegetation management activities on a property. The use of herbicides focuses on controlling woody vegetation within the ROW to reduce the impacts of the need to mow on a property and help establish a sustainable ROW that can be managed with selective herbicide treatments. A timeframe for the conversion of a ROW to establish compatible, non-woody vegetation will vary based on site conditions. A property owner could also encourage this conversion of the ROW to compatible vegetation by allowing selective herbicide use and through planting vegetation that results in increasing compatible vegetation within a ROW.

7.0 ENVIRONMENTAL ANALYSIS OF ROUTE

This section provides a general description of the environmental and human setting of the Route Options and, where applicable, the proposed ROW and proposed alignment identified by the Applicants. Topics discussed in the following subsections are organized to follow the environmental information requirements under Minn. R. 7850.1900, subp. 3 including: environmental setting, human settlement, land-based economies, archaeological and historic resources, natural environment, and rare and unique natural resources. In addition to identifying existing resources under these categories, the potential effects of the Project on resources are discussed, and measures that can be used to avoid, minimize, or mitigate effects are presented. A discussion of unavoidable or irretrievable impacts is presented, as well. Refer to Table 3.1-1 for a list of key routing terms used throughout this chapter.

Sections 7.1 through **7.7** below describe the environmental setting of the Route Options, as well as potential impacts and mitigation measures related to each resource discussed.

7.1 Environmental Setting

The State of Minnesota is divided into Ecological Provinces, Sections, and Subsections. Ecological land classifications, defined under the Ecological Classification System (ECS), are used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. Under this classification system, the Project Segments South, Central, and North are located in the Prairie Parkland Province (251), North Central Glaciated Plains Section (251B), and Minnesota River Prairie Subsection (251Ba). The North Segment is partially located in the Eastern Broadleaf Forest Province (222), Minnesota and Northeast Iowa Morainal Section (222M), and Hardwood Hills Subsection (222Ma). The landscape within the Project Study Area, associated with the above ecological land classifications, changes from the southwest to northeast as a result of past glacial activity and other ecological factors that affected the developing landscape over time. Major rivers in the Project Study Area include the Chippewa River, Pomme de Terre River, and the Minnesota River. A summary of Ecological Provinces, Sections, and Subsections crossed by Route Options, Segment Alternatives, and Connector Segments within the proposed Segments is provided below.

7.1.1 South Segment

The South Segment traverses the Prairie Parkland Province, North Central Glaciated Plains Section, and Minnesota River Subsection. The Route Options and

Segment Alternative within the South Segment are classified under the same ecological Province, Section, and Subsection classifications.

The Prairie Parkland Province extends across the western portion of Minnesota, traversing west into North Dakota and South Dakota and south into Iowa and portions of the central Midwest. The landscape in this Province is heavily influenced by the most recent glaciation and a thick mantle of glacial drift (100 feet to 600 feet deep) covers most of the Province (MDNR 2024a). Bedrock is largely concealed except for exposed areas along the Minnesota River valley and in the southwest corner of the state.

In the Project Study Area, the Prairie Parkland Province is broken down into the North Central Glaciated Plains Section. The North Central Glaciated Plains Section is characterized by level to rolling till plains, moraines, lakes plains, and outwash plains, with upland prairies being the most common vegetative community in the Section (MDNR 2024b).

Within the North Central Glaciated Plains Section, the Minnesota River Prairie Subsection further defines ecological features. This subsection is drained by the Minnesota River. Bedrock in the Minnesota River Prairie Subsection is commonly composed of cretaceous shales, sandstones, and clays (MDNR 2024c). The dominant soil types are well- to moderately well-drained soils formed in gray calcareous till. Pre-settlement vegetative communities throughout the region were primarily tallgrass prairie, with islands of wet and dry to dry-mesic prairie, depending on local hydrology and topographic relief. Present-day land-use is predominantly composed of row-crop agriculture, while prairie remnants and forest floodplains are rare.

7.1.2 Central Segment

The Central Segment traverses the Prairie Parkland Province, North Central Glaciated Plains Section, and Minnesota River Subsection. The ecological Province, Section, and Subsection classifications are the same as described for the South Segment.

7.1.3 North Segment

The North Segment traverses the Prairie Parkland Province, Eastern Broadleaf Forest Province, North Central Glaciated Plains Section, Minnesota and Northeast Iowa Morainal Section, Minnesota River Subsection, and Hardwood Hills Subsection. All Route Options and Segment Alternatives are classified under the Prairie Parkland Province, North Central Glaciated Plains Section, and Minnesota River Subsection. Portions of Route Option North 1 are also classified under the Eastern Broadleaf Forest Province, Minnesota and Northeast Iowa Morainal Section, and Hardwood Hills Subsection.

The Eastern Broadleaf Forest Province extends northwest to southeast along the central and southeastern portions of Minnesota and serves as a transition between semi-arid southeastern portions of the state that were historically prairie and semi-humid, mixed conifer-deciduous forests to the northeast (MDNR 2024d). In the portion of this Province traversed by the Project Study Area, the landscape is characterized by highly calcareous and thick (100 feet to 300 feet deep) glacial drift of Wisconsin Age.

In the Project Study Area, the Eastern Broadleaf Forest Province is broken down into the Minnesota and Northeast Iowa Morainal Section. The Minnesota and Northeast Iowa Morainal Section is characterized by rugged to hummocky moraines deposited during the last glaciation and rolling till or basal till deposited as drumlins (MDNR 2024e).

Within the Minnesota and Northeast Iowa Morainal Section, the Hardwood Hills Subsection further defines ecological features. Bedrock in the Hardwood Hills Subsection and near the Project Study Area is diverse and composed of cretaceous shale, sandstone, clay, Lower Precambrian granite, meta-sedimentary and metaigneous gneiss, schist, and migmatite (MDNR 2024f). Soil textures range from loamy sands and sandy loams on outwash plains to loams and clay loams on moraines. Pre-settlement vegetative communities along the western edge of the Subsection and in the area of the Project included a composite of tallgrass prairie, aspen-oak land, and oak savanna. Present-day land use is predominantly composed of agriculture, and remaining areas of forest and prairie are small and fragmented.

7.2 Human Settlement

Transmission lines have the potential to impact human settlements during construction and operation of a project, which can be avoided, minimized, or mitigated with proper planning and siting practices. Potential public and health and safety issues during construction include injuries due to falls, equipment use, and electrocution. Potential health concerns related to operation of a transmission line include electric and magnetic fields (EMF), stray voltage, induced voltage, impaired air quality, and electrocution. Transmission lines also have the potential to displace homes or businesses, introduce new noise sources, affect the aesthetics and socioeconomics of the region in which the project would occur, be incompatible with local land use and zoning, interfere with electronic communications, and impact public services (e.g., transportation).

The following subsections present an overview of the resources related to human settlement in the Project Study Area and discuss how the Project may affect these

resources and what measures the Applicants will implement to mitigate potential effects. Municipalities crossed by the Route Options are identified in Table 7.2-1.

Table 7.2-1 Municipal Boundaries Crossed by Route Options

Municipality	Type	County	Route Options
Akron	Township	Big Stone	South 1, South 2
Alexandria	City	Douglas	North 1, North 2
Artichoke	Township	Big Stone	South 2
Ben Wade	Township	Pope	Central 1, Central 2, North 1, North 2
Clontarf	Township	Swift	Central 2
Fairfield	Township	Swift	South 1, South 2
Glenwood	City	Pope	North 2
Hegbert	Township	Swift	South 2
Hodges	Township	Stevens	Central 1, Central 2
Hoff	Township	Pope	Central 2
Holmes City	Township	Douglas	North 1
Hudson	Township	Douglas	North 2
La Grand	Township	Douglas	North 1, North 2
Lake Mary	Township	Douglas	North 1, North 2
Leven	Township	Pope	North 2
Marysland	Township	Swift	South 1
Moore	Township	Stevens	Central 1, Central 2
Moyer	Township	Swift	South 1
New Prairie	Township	Pope	Central 1, Central 2
Odessa	Township	Big Stone	South 1, South 2
Ortonville	City	Big Stone	South 1, South 2
Ortonville	Township	Big Stone	South 1, South 2
Reno	Township	Pope	North 1, North 2
Shible	Township	Swift	South 1
Tara	Township	Swift	South 1, South 2, Central 1, Central 2
Walden	Township	Pope	Central 1, Central 2
White Bear Lake	Township	Pope	Central 1, Central 2

7.2.1 Land Use and Land Cover

The Applicants reviewed information available from the U.S. Geological Survey (USGS) National Land Cover Database to characterize existing land cover and uses traversed by the Route Options and ROW (USGS 2021). Land cover and land use encountered along the Route Options are discussed for each segment below.[7] The primary land cover type crossed by the Project is agricultural. Typical crops grown in agricultural

[7] Current land cover and use may differ from the data available at the time of this Application.

areas of the Project include corn for grain and silage, soybeans, hay/haylage, dry beans, and oats or rye for grain. A discussion of the existing agricultural economy is presented in **Section 7.3.1**.

Developed lands across all Route Options generally consist of existing farmsteads and rural residential lots along the Route Options. Open space across all Route Options is generally attributed to the presence of developed and rural roadways.

Additional land uses are covered in other sections of this Application. For example, see **Section 7.4.12.3.5** for a discussion of state conservation easements. Refer to **Appendix D-1, Appendix D-2,** and **Appendix D-3**for the locations of USFWS fee title lands, USFWS wetland and grassland easements including WPAs, and other state and federally managed lands relative to the Route Width.

7.2.1.1 South Segment

The ROW required for the proposed 345 kV transmission line along the South Segment is 150 feet wide (75 feet on either side of the Application Alignment) with Route Option South 1 being 41.94 miles long and Route Option South 2 being 38.82 miles long. The land uses and land cover types for each are described below.

7.2.1.1.1 Route Option South 1

The dominant land cover within Route Option South 1 is cultivated crops, making up approximately 80 percent of the Route Option and 69 percent of the ROW. Pasture/hay makes up approximately three percent of the Route Option and four percent of the ROW.

Developed areas within Route Option South 1 make up approximately 1.5 percent of the Route Option, and two percent of the ROW.

Emergent herbaceous wetlands make up approximately six percent of the Route Option and seven percent of the ROW. All other land cover types are individually less than five percent. Table 7.2-2 provides a breakdown of land cover acreages and percentages within the Route Option and ROW for Route Option South 1.

Table 7.2-2 Route Option South 1 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	59.6	1.0	6.8	0.9
Cultivated Crops	4,748.5	79.9	524.8	68.8
Deciduous Forest	18.3	0.3	0.0	0.0
Developed (High Intensity)	7.2	0.1	0.0	0.0
Developed (Low Intensity)	59.3	1.0	13.5	1.8
Developed (Medium Intensity)	22.7	0.4	4.2	0.5

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Open Space	285.4	4.8	118.0	15.5
Emergent Herbaceous Wetlands	370.9	6.2	50.4	6.6
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	187.3	3.2	28.5	3.7
Grassland/Herbaceous	35.7	0.6	3.8	0.5
Mixed Forest	1.8	0.0	0.5	0.1
Open Water	56.6	1.0	5.6	0.7
Woody Wetlands	91.2	1.5	6.7	0.9
Total[1]	5,944.6	100.0	762.7	100.0

[1]Addends may not sum due to rounding.

7.2.1.1.2 Route Option South 2

The dominant land cover within Route Option South 2 is cultivated crops, making up approximately 74 percent of the Route Option and 60 percent of the ROW. Pasture/hay makes up approximately three percent of the Route Option and less than two percent of the ROW.

Developed areas within Route Option South 2 make up approximately two percent of the Route Option and five percent of the ROW.

Emergent herbaceous wetlands make up approximately nine percent of the Route Option and eight percent of the ROW. Open space accounts for approximately eight percent of the Route Option and 22 percent of the ROW. All other land cover types are individually less than two percent. Table 7.2-3 provides a breakdown of land cover acreages and percentages within the Route Option and ROW for Route Option South 2.

Table 7.2-3 Route Option South 2 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	33.4	0.7	3.8	0.5
Cultivated Crops	3,427.5	73.8	425.0	60.2
Deciduous Forest	39.9	0.9	0.9	0.1
Developed (High Intensity)	1.7	0.0	0.3	0.0
Developed (Low Intensity)	70.2	1.5	29.8	4.2
Developed (Medium Intensity)	18.9	0.4	6.3	0.9
Open Space	356.8	7.7	157.6	22.3
Emergent Herbaceous Wetlands	431.4	9.3	57.1	8.1
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	128.9	2.8	10.1	1.4
Grassland/Herbaceous	56.8	1.2	7.8	1.1

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Mixed Forest	0.0	0.0	0.0	0.0
Open Water	52.7	1.1	2.2	0.3
Woody Wetlands	26.0	0.6	5.0	0.7
Total[1]	4,644.1	100.0	706.0	100.0

[1]Addends may not sum due to rounding.

7.2.1.1.3 Connector Segment S16

The Applicants have proposed Connector Segment S16 to allow for transitioning between Route Option South 1 and Route Option South 2 which is 0.49 mile long. The dominant land cover within Connector Segment S16 is cultivated crops, making up approximately 80 percent of the Route Option and 82 percent of the ROW. Table 7.2-4 provides a breakdown of the land cover types of Connector Segment S16.

Table 7.2-4 Connector Segment S16 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	0.0	0.0	0.0	0.0
Cultivated Crops	66.3	80.3	7.6	81.7
Deciduous Forest	0.0	0.0	0.0	0.0
Developed (High Intensity)	0.0	0.0	0.0	0.0
Developed (Low Intensity)	0.0	0.0	0.0	0.0
Developed (Medium Intensity)	0.0	0.0	0.0	0.0
Open Space	0.0	0.0	0.0	0.0
Emergent Herbaceous Wetlands	13.7	16.6	1.7	18.3
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	0.0	0.0	0.0	0.0
Grassland/Herbaceous	0.0	0.0	0.0	0.0
Mixed Forest	0.0	0.0	0.0	0.0
Open Water	2.6	3.1	0.0	0.0
Woody Wetlands	0.0	0.0	0.0	0.0
Total[1]	82.6	100.0	9.3	100.0

[1]Addends may not sum due to rounding.

7.2.1.1.4 Connector Segment S17

The Applicants have proposed Connector Segment S17 to allow for transitioning between Route Option South 1 and Route Option South 2 which is 0.52 mile long. The dominant land cover within Connector Segment S17 is cultivated crops, making up approximately 100 percent of the Route Option and ROW. Table 7.2-5 provides a breakdown of the land cover types of Connector Segment S17.

Table 7.2-5 Connector Segment S17 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	0.0	0.0	0.0	0.0
Cultivated Crops	85.7	100.0	9.8	100.0
Deciduous Forest	0.0	0.0	0.0	0.0
Developed (High Intensity)	0.0	0.0	0.0	0.0
Developed (Low Intensity)	0.0	0.0	0.0	0.0
Developed (Medium Intensity)	0.0	0.0	0.0	0.0
Open Space	0.0	0.0	0.0	0.0
Emergent Herbaceous Wetlands	0.0	0.0	0.0	0.0
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	0.0	0.0	0.0	0.0
Grassland/Herbaceous	0.0	0.0	0.0	0.0
Mixed Forest	0.0	0.0	0.0	0.0
Open Water	0.0	0.0	0.0	0.0
Woody Wetlands	0.0	0.0	0.0	0.0
Total[1]	85.7	100.0	9.8	100.0

[1]Addends may not sum due to rounding.

7.2.1.2 Central Segment

The ROW required for the 345 kV transmission line in the Central Segment is 150 feet wide (75 feet on either side of the Application Alignment) with Route Option Central 1 being 34.43 miles long and Central Route Option Central 2 being 38.55 miles long. The land uses and land cover types for each are described below.

7.2.1.2.1 Route Option Central 1

The dominant land cover within Route Option Central 1 is cultivated crops, making up approximately 89 percent of the Route Option and 66 percent of the ROW. Pasture/hay makes up approximately one percent of the Route Option and less than one percent of the ROW.

Developed areas within Route Option Central 1 make up approximately three percent of the Route Option, and 11 percent of the ROW.

Open space makes up approximately five percent of the Route Option and 22 percent of the ROW. All other land cover types are individually less than two percent. Table 7.2-6 provides a breakdown of land cover acreages and percentages within the Route Option and ROW for Route Option Central 1.

Table 7.2-6 Route Option Central 1 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	3.9	0.1	0.4	0.1
Cultivated Crops	3,736.1	88.5	413.3	66.0
Deciduous Forest	12.4	0.3	0.0	0.0
Developed (High Intensity)	5.1	0.1	2.1	0.3
Developed (Low Intensity)	96.1	2.3	55.6	8.8
Developed (Medium Intensity)	26.0	0.6	12.6	2.0
Open Space	222.5	5.3	137.4	22.0
Emergent Herbaceous Wetlands	61.6	1.5	3.9	0.6
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	43.0	1.0	0.3	0.1
Grassland/Herbaceous	5.2	0.1	0.0	0.0
Mixed Forest	1.0	0.0	0.0	0.0
Open Water	8.0	0.2	0.4	0.1
Woody Wetlands	1.1	0.0	0.1	0.0
Total[1]	4,222.0	100.0	626.1	100.0

[1]Addends may not sum due to rounding.

7.2.1.2.2 Route Option Central 2

The dominant land cover within Route Option Central 2 is cultivated crops, making up approximately 90 percent of the Route Option and 71 percent of the ROW. Pasture/hay makes up less than one percent of the Route Option and the ROW.

Developed areas within Route Option Central 2 make up approximately two percent of the Route Option, and eight percent of the ROW.

Emergent herbaceous wetlands make up just less than four percent of the Route Option and the ROW. Open space makes up approximately four percent of the Route Option and 17 percent of the ROW. All other land cover types are individually less than two percent. Table 7.2-7 provides a breakdown of land cover acreages and percentages within the Route Option and ROW for Route Option Central 2.

Table 7.2-7 Route Option Central 2 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	3.5	0.1	0.4	0.1
Cultivated Crops	6,011.0	89.5	499.9	71.3
Deciduous Forest	11.0	0.2	0.9	0.1
Developed (High Intensity)	6.6	0.1	1.5	0.2
Developed (Low Intensity)	91.4	1.4	44.3	6.3

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Developed (Medium Intensity)	30.7	0.5	10.5	1.5
Open Space	266.2	4.0	118.6	16.9
Emergent Herbaceous Wetlands	227.1	3.4	21.7	3.1
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	51.8	0.8	1.2	0.2
Grassland/Herbaceous	3.9	0.1	1.1	0.2
Mixed Forest	0.9	0.0	0.2	<0.1
Open Water	6.7	0.1	0.0	0.0
Woody Wetlands	4.7	0.1	0.6	0.1
Total[1]	6,715.5	100.0	700.9	100.0

[1]Addends may not sum due to rounding.

7.2.1.2.3 Connector Segment C11

The Applicants have proposed Connector Segment C11 to allow for transitioning between Route Option Central 1 and Route Option Central 2 which is 1.49 miles long. The dominant land cover within Connector Segment C11 is cultivated crops, making up approximately 93 percent of the Route Option and 94 percent in the ROW. Table 7.2-8 provides a breakdown of the land cover types of Connector Segment C11.

Table 7.2-8 Connector Segment C11 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	0.0	0.0	0.0	0.0
Cultivated Crops	190.4	93.4	25.9	93.8
Deciduous Forest	0.0	0.0	0.0	0.0
Developed (High Intensity)	0.0	0.0	0.0	0.0
Developed (Low Intensity)	0.0	0.0	0.0	0.0
Developed (Medium Intensity)	0.0	0.0	0.0	0.0
Open Space	4.5	2.2	0.5	1.8
Emergent Herbaceous Wetlands	8.3	4.1	1.2	4.4
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	0.0	0.0	0.0	0.0
Grassland/Herbaceous	0.0	0.0	0.0	0.0
Mixed Forest	0.0	0.0	0.0	0.0
Open Water	0.7	0.3	0.0	0.0
Woody Wetlands	0.0	0.0	0.0	0.0
Total[1]	203.9	100.0	27.6	100.0

[1]Addends may not sum due to rounding.

7.2.1.3 North Segment

The ROW required for the 345 kV transmission line in the North Segment is 150 feet wide (75 feet on either side of the Application Alignment) with Route Option North 1 being 18.13 miles long and Route Option North 2 being 25.26 miles long. The land uses and land cover types for each are described below.

7.2.1.3.1 Route Option North 1

The dominant land cover within Route Option North 1 is cultivated crops, making up approximately 80 percent of the Route Option and 76 percent of the ROW. Pasture/hay makes up approximately four percent of the Route Option and three percent of the ROW.

Developed areas within Route Option North 1 make up approximately three percent of the Route Option, and four percent of the ROW.

Emergent herbaceous wetlands make up approximately four percent of the Route Option and the ROW. Deciduous forest makes up approximately four percent of the Route Option and one percent of the ROW. All other land cover types are individually less than five percent. Table 7.2-9 provides a breakdown of land cover acreages and percentages within the Route Option and ROW for Route Option North 1.

Table 7.2-9 Route Option North 1 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	0.4	0.0	0.1	0.0
Cultivated Crops	2,084.7	80.2	250.8	76.1
Deciduous Forest	105.1	4.0	4.3	1.3
Developed (High Intensity)	11.8	0.5	0.2	0.1
Developed (Low Intensity)	32.7	1.3	9.7	2.9
Developed (Medium Intensity)	21.1	0.8	4.3	1.3
Open Space	74.9	2.9	32.7	9.9
Emergent Herbaceous Wetlands	104.2	4.0	13.0	4.0
Evergreen Forest	0.0	0.0	0.0	0.0
Pasture/Hay	110.6	4.3	8.5	2.6
Grassland/Herbaceous	7.8	0.3	0.7	0.2
Mixed Forest	0.0	0.0	0.0	0.0
Open Water	43.2	1.7	5.0	1.5
Woody Wetlands	3.7	0.1	0.3	0.1
Total[1]	2,600.4	100.0	329.7	100.0

[1]Addends may not sum due to rounding.

7.2.1.3.2 Route Option North 2

The dominant land cover within Route Option North 2 is cultivated crops, making up approximately 65 percent of the Route Option and 62 percent of the ROW. Pasture/hay makes up approximately 17 percent of the Route Option and 18 percent of the ROW.

Developed areas within Route Option North 2 make up approximately four percent of the Route Option and the ROW.

Emergent herbaceous wetlands make up approximately eight percent of the Route Option and nine percent of the ROW. Open space makes up approximately two percent of the Route Option and six percent of the ROW. All other land cover types are individually less than two percent. Table 7.2-10 provides a breakdown of land cover acreages and percentages within the Route Option and ROW for Route Option North 2.

Table 7.2-10 Route Option North 2 Land Cover Types

Land Cover Type	Route Width (acres)	Percent of Route Width	ROW (acres)	Percent of ROW
Barren Land (Rock/Sand/Clay)	21.8	0.7	3.4	0.7
Cultivated Crops	1,956.7	65.3	284.4	61.9
Deciduous Forest	20.5	0.7	2.5	0.5
Developed (High Intensity)	15.8	0.5	0.3	0.1
Developed (Low Intensity)	46.9	1.6	12.1	2.7
Developed (Medium Intensity)	50.6	1.7	3.6	0.8
Open Space	67.5	2.3	25.6	5.6
Emergent Herbaceous Wetlands	233.4	7.8	39.3	8.5
Evergreen Forest	1.6	0.1	0.0	0.0
Pasture/Hay	519.6	17.3	82.5	18.0
Grassland/Herbaceous	13.4	0.4	1.8	0.4
Mixed Forest	1.8	0.1	0.1	0.0
Open Water	30.6	1.0	1.4	0.3
Woody Wetlands	18.7	0.6	2.2	0.5
Total[1]	2,997.3	100.0	459.4	100.0

[1]Addends may not sum due to rounding.

7.2.1.4 Impacts and Mitigation

The Project is not anticipated to significantly alter existing land use or land cover. However, the Project will result in minor impacts on both a temporary basis (during construction of the Project) and a permanent basis (as part of operation of the facilities post-construction).

Existing land uses along the transmission line will experience minimal, short-term impacts during the period of construction. As stated in **Section 6.2**, vegetation in the ROW would be cleared as needed. There are minimal forest land cover types present within the ROW, however, forest land cover types would be most affected because all trees would be cleared, and the land cover would be converted permanently to a different cover type. When transmission line construction is complete, Project workspaces will be restored as described in **Section 6.3**, and land uses which are consistent with the safe and reliable operation of the Project will be allowed to continue as before. The Route Options presented in this Application are anticipated to only have minor impacts because they were designed to predominantly parallel existing infrastructure or land divisions, such as existing transmission lines, roadways, property lines, and agricultural field edges, and to avoid municipalities and other densely populated residential areas. Mitigation measures for impacts to agricultural land and wetland cover within the ROW are described in detail in **Sections 7.3.1** and **7.4.8**.

Minor, permanent impacts to land cover will occur where new transmission structures and foundations are installed. Land cover impacts by Project Segment are detailed in **Appendix C**. Permanent impacts to land cover will also occur at the location of the new Regeneration Station. The majority of lands crossed by the Project include cultivated crop, developed use, and open space land cover types. The land uses associated with cultivated crop and developed cover types (e.g., agricultural and private land use) are likely to continue during operation of the Project with only minor permanent impacts from the installation of permanent structures and the Regeneration Station. As described in **Section 7.2.1**, permanent impacts from the conversion of land cover types in the ROW would occur for existing forest cover types, including deciduous forest, mixed forest, and wooded wetlands.

The Applicants will implement an agricultural impact mitigation plan (AIMP) and reasonably restore and/or compensate landowners, as appropriate, for damages caused by transmission line construction, and as outlined in the AIMP (*See* **Appendix K**). The Applicants will also implement a VMP to mitigate impacts and restore lands impacted by construction (*See* **Appendix J**).

7.2.2 Public Health and Safety

Public health and safety will be a priority during the construction and operation of the Project. Safety concerns related to construction may include hazards associated with conductor stringing in public areas, movement of heavy equipment across roadways, and land clearing. Potential operational concerns include electrocution, fire, and outages.

Public emergency services in the Project Study Area are described in **Section 7.2.11.1**. Electric and magnetic fields are described in **Section 7.2.4.**

The Project will be designed to meet or exceed local, state, and NESC standards regarding ground clearance, crossing utilities clearance, building clearance, strength of materials, and ROW 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 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 protect the public by de-energizing the transmission line should such an event occur. In addition, the substation facilities will be properly fenced and accessible only by authorized personnel.

7.2.2.1 Stray Voltage and Induced Voltage

"Stray voltage" is a condition that can potentially occur on the electric service entrances to buildings from distribution lines connected to these buildings; not typically transmission lines as proposed in this Application. The term generally describes a voltage difference 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 the 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 buildings. 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 induced voltages if they become problematic. Additional information regarding stray voltage is available in the Minnesota Stray Voltage Guide that is available online at www.minnesotastrayvoltageguide.com.

7.2.2.2 Farming Operations, Vehicle Use, and Metal Buildings Near Power Lines

The Project 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 charged with induced voltage from transmission lines if they are paralleled for a long enough distance. 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 if problems arise.

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 located under high voltage transmission lines could be charged with an electric charge. Without a grounding path, this charge can provide a nuisance shock if the vehicle or conductive body is touched while standing on the ground. 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 to tires 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 and not impacting humans unless the vehicle has unusually old tires or is parked on dry rock, plastic, or other surfaces that insulate them from the ground.

Buildings are allowed near transmission lines but are generally discouraged within the ROW 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 ROW 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 allow 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, but these issues can be mitigated with proper grounding.

7.2.2.3 Impacts and Mitigation

The Project's general contractor will identify and secure all active construction areas to prevent public access to potentially hazardous areas and will require workers to follow safety standards. In the event an incident does occur, the Project's emergency

response plan will be implemented, and area local emergency services will be contacted, as needed.

To ensure that an electric discharge from induced voltages do not reach unsafe levels, rule 232.C.1.c of the NESC requires that any discharge be less than 5 milliampere (mA). During construction, the Applicants will plan to ground all existing fixed objects, such as a fence or other large permanent conductive objects close to or parallel to the route, such that an electrical discharge will be less than the 5 mA NESC limit.

With the proper safeguards and protective measures described above, impacts related to public health and safety are not anticipated.

7.2.3 Proximity to Residences

For transmission lines, NESC and the Applicants' standards require certain clearances between transmission line conductors and the ground, and between transmission line conductors and buildings, for safe operation of the transmission line. To comply with NESC standards and allow sufficient space for transmission line operation and maintenance, transmission lines are generally routed to avoid residences or other buildings within the ROW. Residences or other buildings located within a ROW that cannot be avoided are generally removed or displaced.

The Route Options presented in this Application avoid densely populated areas where feasible. The Applicants considered potential impacts to residences in the development of the Route Options and will avoid displacing residential homes, buildings, and businesses to the extent practicable. However, a portion of Route Option South 1 (i.e., Subsegment S2), where the Application Alignment crosses U.S. Highway 75, a railroad, and existing HVTLs, may require residences or other buildings (i.e. sheds, garages) to be removed or displaced depending on the final alignment. The Route Options differ in distance to residential areas (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3** for detailed Route maps). A summary of the proximity of each Route Option to residences is presented below and included in **Appendix C**.

7.2.3.1 South Segment

There are no residences within 150 feet of the Application Alignment for either Route Option, the Segment Alternative, or the Connector Segments in the South Segment.

There are seven residences within 500 feet of the Application Alignment for Route Option South 1. Of these, three are located between 151 and 300 feet of the Application Alignment and four are located between 301 feet and 500 feet of the Application Alignment. There are 22 residences within 500 feet of the Application Alignment for Route Option South 2. Of these, 16 are located between 151 and 300 feet of the

Application Alignment and six are located between 301 feet and 500 feet of the Application Alignment. There are no residences located within 500 feet of the Application Alignment for Segment Alternative S18, Connector Segment S16, or Connector Segment S17. Table 7.2-11 provides the proximity of residences to the Application Alignment of each component of the South Segment.

Table 7.2-11 South Segment: Proximity of Residences to Application Alignment

Residence Proximity (feet)	Route Option South 1	Route Option South 2	Segment Alternative S18	Connector Segment S16	Connector Segment S17
0-75	0	0	0	0	0
76-150	0	0	0	0	0
151-300	3	16	0	0	0
301-500	4	6	0	0	0
Total Residences	7	22	0	0	0

7.2.3.2 Central Segment

There are no residences within 75 feet of the Application Alignment for either Route Option or the Connector Segment in the Central Segment.

There are 11 residences within 500 feet of the Application Alignment for Route Option Central 1. Of these, one is located between 76 and 150 feet of the Application Alignment, two are located between 151 and 300 feet of the Application Alignment, and eight are located between 301 and 500 feet of the Application Alignment.

There are 11 residences within 500 feet of the Application Alignment for Route Option Central 2. Of these, eight are located between 151 and 300 feet of the Application Alignment and three are located between 301 and 500 feet of the Application Alignment.

There are no residences located within 500 feet of the Application Alignment for Connector Segment C11. Table 7.2-12 provides the proximity of residences to the Application Alignment of each component of the Central Segment.

Table 7.2-12 Central Segment: Proximity of Residences to Application Alignment

Residence Proximity (feet)	Route Option Central 1	Route Option Central 2	Connector Segment C11
0-75	0	0	0
76-150	1	0	0
151-300	2	8	0
301-500	8	3	0
Total Residences	11	11	0

7.2.3.3 North Segment

There are no residences within 150 feet of the Application Alignment for either Route Option or the Segment Alternatives in the North Segment.

There are 17 residences within 500 feet of the Application Alignment for Route Option North 1. Of these, nine are located between 151 and 300 feet of the Application Alignment and eight are located between 301 and 500 feet of the Application Alignment.

There are eight residences within 500 feet of the Application Alignment for Route Option North 2. Of these, one is located between 151 and 300 feet of the Application Alignment and seven are located between 301 and 500 feet of the Application Alignment.

One residence is located between 151 and 300 feet of the Application Alignment for Segment Alternative N9 and two residences are located within 500 feet of the Application Alignment for Segment Alternative N11 - one between 151 and 300 feet and one between 301 and 500 feet of the Application Alignment. There are no residences located within 500 feet of the Application Alignment for Segment Alternative N10. Table 7.2-13 provides the proximity of residences to the Application Alignment of each component of the North Segment.

Table 7.2-13 North Segment: Proximity of Residences to Application Alignment

Residence Proximity (feet)	Route Option North 1	Route Option North 2	Segment Alternative N9	Segment Alternative N10	Segment Alternative N11
0-75	0	0	0	0	0
76-150	0	0	0	0	0
151-300	9	1	1	0	1
301-500	8	7	0	0	1
Total Residences	17	8	1	0	2

7.2.3.4 Impacts and Mitigation

The Applicants considered potential impacts to residences in the development of the Route Options and will avoid displacing residential homes, buildings, and businesses to the extent practicable. There are no residences within the ROW of the Route Options except a portion of Route Option South 1 (i.e., Subsegment S2) that may require residences or other buildings that cannot be avoided to be removed or displaced depending on the final alignment. If displacement were to occur, impacts to residences would be significant. Implementation of transmission line infrastructure could result in visual impacts to residences along the Route Options. For a discussion of aesthetic impacts of the transmission line to residential areas, see **Section 7.2.6**.

7.2.4 Electric and Magnetic Fields

"EMF" is an acronym for the phrase electric and magnetic fields. For the lower frequencies associated with power lines (referred to as ELF), EMF should be considered separately – electric fields and magnetic fields, measured in kilovolt per meter (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).

7.2.4.1 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.[8] 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 7-1** provides the electric fields at the nominal (345 kV) and maximum conductor voltage for the proposed transmission line. Maximum conductor voltage is defined as the nominal voltage plus ten percent (379.5 kV). The maximum electric field, measured at one meter (3.28 feet) above ground, associated with the Project is calculated to be 6.4 kV/m. As shown in **Figure 7-1**, the strength of electric fields diminishes rapidly as the distance from the conductor increases. The electric field values for two different operating voltages along the transmission line ROW and sample points beyond are shown in Table 7.2-14.

[8] In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, S.D. to Hampton, Minn., Docket No. ET2/TL-08-1474, ORDER GRANTING ROUTE PERMIT (Sept. 14, 2010) (adopting the Administrative Law Judge's Findings of Fact, Conclusions, and Recommendation at Finding 194).

Figure 7-1 Calculated Electric Fields (kV/m) for Proposed 345 Kilovolt Transmission Line Designs (3.28 feet above ground)

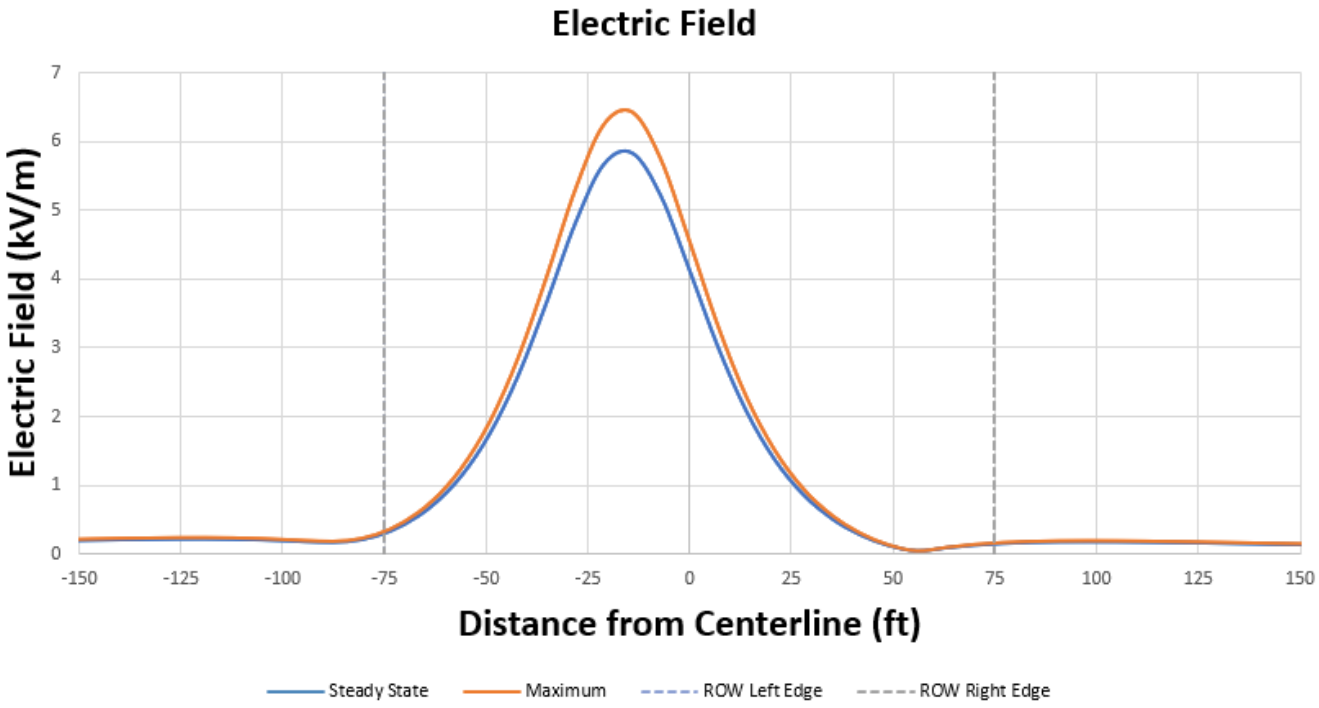


Table 7.2-14 Electric Field Calculations Summary at one meter above ground

Maximum Values		Distance to Application Alignment (Feet)												
Within ROW	Edge of ROW	-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Steady State at 100% of nominal voltage (kV/m)														
5.8	0.30	0.07	0.14	0.19	0.30	1.7	5.2	4.1	1.1	0.10	0.14	0.17	0.09	0.05
Maximum at 110% of nominal voltage (kV/m)														
6.4	0.33	0.07	0.15	0.21	0.33	1.8	5.7	4.6	1.2	0.12	0.16	0.19	0.10	0.06

7.2.4.2 Magnetic Fields

The projected magnetic fields for different operating conditions of the Project are provided in Table 7.2-15 and **Figure 7-2**. Since magnetic fields are dependent on the current flowing on the line, magnetic fields were calculated for two different system conditions during the Project's first year in service (2030). 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 857 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 421 MVA) represents the

current flow on the line during the non-peak time (winter months) when there are high levels of wind generation and the transmission system is intact (i.e., no outages).

The magnetic field values for the two operating conditions 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 conductor increases (proportional to the inverse square of the distance from the source). In addition, since the magnetic field produced by the transmission line 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.

Figure 7-2 Calculated Magnetic Field(mG) for Proposed 345 Kilovolt Single Circuit Transmission Line on Double Circuit Capable Structures (3.28 feet above ground)

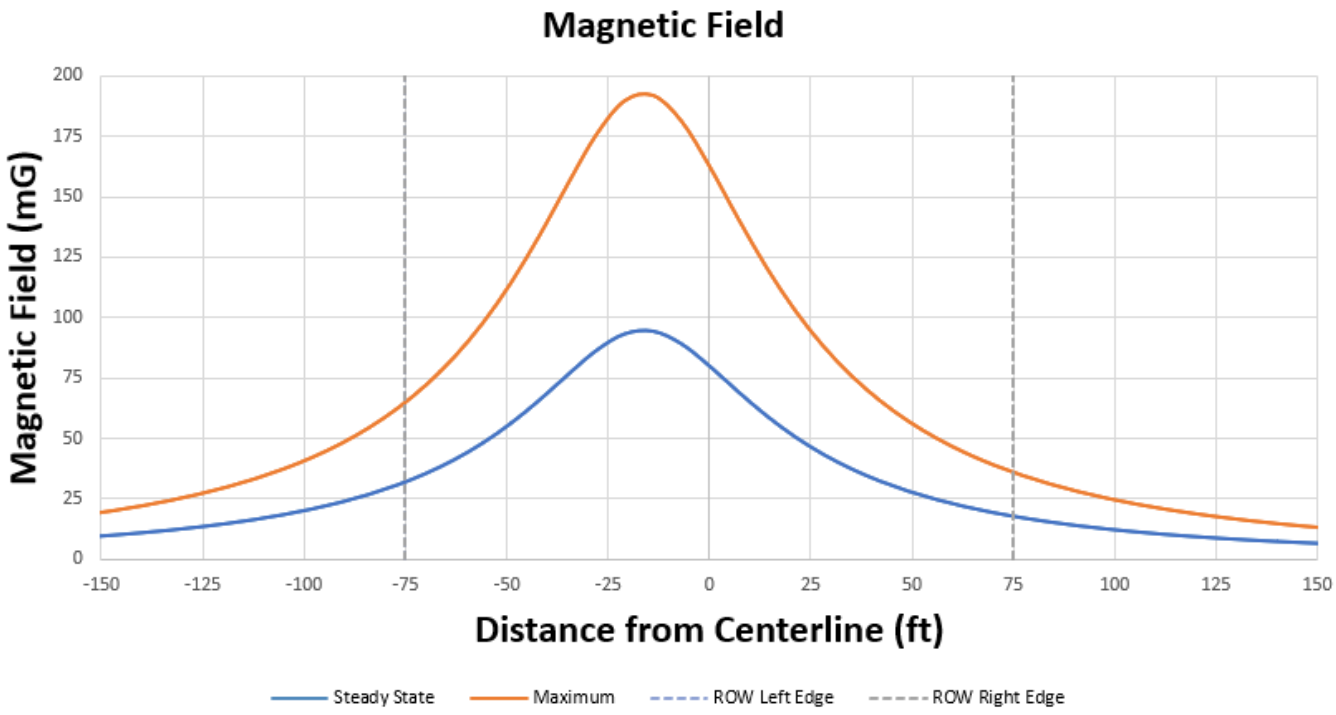


Table 7.2-15 Magnetic Field Calculations Summary at one meter above ground

Maximum Values		Distance to Application Alignment (Feet)												
Within ROW	Edge of ROW	-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Single Circuit with steady state current of 705 A (mG)														
94	32	2	6	20	32	55	89	80	47	28	18	12	4	2
Single Circuit with maximum current of 1,434 A (mG)														
192	65	5	11	41	65	112	182	163	95	56	36	25	8	4

7.2.4.3 Impacts and Mitigation

There are presently no Minnesota regulations pertaining to magnetic field exposure. 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 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.

Since the 1970s, a large amount of scientific research has been conducted on EMF and health. This 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.

For example, in 2016, the U.S. National Cancer Institute summarized the research as follows:

> Numerous epidemiologic studies and comprehensive reviews of scientific literature have evaluated possible associations between exposure to non-ionizing EMFs and the risk of cancer in children (13–15). (Magnetic fields are the component of non-ionizing EMFs that are usually studied in relation to their possible health effects.) Most of the research has focused on leukemia and brain tumors, the two most common cancers in children. Studies have examined associations of these cancers with living near power lines, with magnetic fields in the home, and with exposure of parents to high levels of magnetic fields in the workplace. No consistent evidence for an association between any source of non-ionizing EMF and cancer has been found.[9]

[9] NAT'L CANCER INSTITUTE, Electromagnetic Fields and Cancer, available at https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/electromagnetic-fields-fact-sheet.

Minnesota, Wisconsin, 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 from any potential problems resulting from high voltage transmission line 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.[10] The report summarized the findings of the Working Group as follows:

> Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe.[11]

[10] MINN. STATE INTERAGENCY WORKING GRP. ON EMF ISSUES, A WHITE PAPER ON ELECTRIC AND MAGNETIC FIELD (EMF) POLICY AND MITIGATION OPTIONS (Sept. 2002), available at https://apps.commerce.state.mn.us/eera/web/project-file?legacyPath=/opt/documents/EMF%20White%20Paper%20-%20MN%20Workgroup%20Sep%202002.pdf.

[11] MINN. STATE INTERAGENCY WORKING GRP. ON EMF ISSUES, A WHITE PAPER ON ELECTRIC AND MAGNETIC FIELD (EMF) POLICY AND MITIGATION OPTIONS (Sept. 2002), available at https://apps.commerce.state.mn.us/eera/web/project-file?legacyPath=/opt/documents/EMF%20White%20Paper%20-%20MN%20Workgroup%20Sep%202002.pdf.

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."[12]

7.2.5 Audible Noise

Noise is defined by the MPCA as undesired sound (MPCA 2015). Noise can vary in intensity and magnitude across the entire frequency spectrum. Higher to more moderate noise frequencies can typically be heard with greater ease than lower frequencies and are, therefore, generally given more "weight" for how intensely they can be perceived by the human ear. To account for the differences in how humans respond to sound and the variance in perception for high and low frequencies, an "A-weighted decibel" (dBA) scale is frequently used, which logarithmically approximates relative human perceptions of loudness. It is commonly accepted that an increase of three dBA is considered barely perceptible to the average listener, but an increase of ten dBA noise levels is perceived as a doubling of loudness, and an increase of twenty dBA is a quadrupling of loudness (FHWA 2018, MPCA 2015). Additionally, as dBA rises, human hearing is more likely to be damaged.

When considering cumulative noise impacts in an environment with several sources of noise, if there is a difference of greater than ten dBA between noise sources, there will be no additive effect and only the louder source will contribute to noise. Therefore, noise levels associated with quiet sources can be barely perceptible compared to ambient noise levels and may not increase existing background noise (Canadian Centre for Occupational Health and Safety 2019).

Table 7.2-16 provides noise levels associated with common, everyday sources, providing context for the noise sources discussed below.

[12] In the Matter of the Application of Xcel Energy for a Route Permit for the Lake Yankton to Marshall Transmission Line Project in Lyon County, Docket No. E002/TL-07-1407, FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER ISSUING A ROUTE PERMIT TO XCEL ENERGY FOR THE LAKE YANKTON TO MARSHALL TRANSMISSION PROJECT at 7-8 (Aug. 29, 2008); *see also* In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project, Docket No. ET2, E015/TL-06-1624, FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER ISSUING A ROUTE PERMIT TO MINNESOTA POWER AND GREAT RIVER ENERGY FOR THE TOWER TRANSMISSION LINE PROJECT AND ASSOCIATED FACILITIES at 23 (Aug. 1, 2007) ("Currently, there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects.").

Table 7.2-16 Common Noise Sources and Levels

Sound Pressure Level (dBA)	Noise Source
110	Rock band at 5 meters
100	Jet flyover at 300 meters
90	Gas lawnmower at 1 meter
80	Food blender at 1 meter
70	Vacuum cleaner at 3 meters
60	Normal speech at 1 meter
50	Dishwasher next room, quiet urban daytime
40	Library, quiet urban nighttime
30	Bedroom at night
20	Quiet rural nighttime
10	Broadcast recording studio
0	Threshold of hearing

Source: MPCA 2015.

The MPCA has established standards for the regulation of noise levels for residential, commercial, and industrial areas. The audible land use activities associated with residential, commercial, and industrial land have been grouped together into Noise Area Classifications (NACs) under Minn. R. parts 7030.0040 and 7030.0050, shown in Table 7.2-17. Each NAC has been assigned daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) noise limits for land use activities. Under MPCA guidelines, "L10" means the sound level, expressed in dBA, which is exceeded ten percent of the time for a one-hour survey, as measured by test procedures approved by the commissioner, and "L50" means the sound level, expressed in dBA, which is exceeded 50 percent of the time for a one-hour survey. L10 and L50 describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare used for determining compliance with Minn. R. parts 7030.0040 and 7030.0050.

Table 7.2-17 Noise Area Classifications under Minnesota Rules

Noise Area Classification (NAC)	Land Use Activities	Daytime		Nighttime	
		L50	L10	L50	L10
1	Residential housing	60	65	50	55
	Religious activities				
	Camping and picnicking areas				
	Health services				
	Hotels				
	Educational services				

Noise Area Classification (NAC)	Land Use Activities	Daytime		Nighttime	
		L50	L10	L50	L10
2	Retail	65	70	65	70
	Business and government services				
	Recreational activities				
	Transit passenger terminals				
3	Highways	75	80	75	80
	Utilities				
	Manufacturing				
	Fairgrounds and amusement parks				
	Agricultural and forestry activities				

7.2.5.1 Noise Related to Construction

Construction activities will generate noise that is short-term and intermittent. Construction noise typically includes intermittent noise associated with operation of heavy equipment and transport of equipment and personnel to and from construction sites during daytime hours. Noise related to construction ranges from minimal to significant depending on equipment type and duration may vary depending on the type of construction activity. Residents living in close proximity to the construction of the Project could be temporarily affected by noise occurring during construction activities. Although construction of the Project is estimated to last between three and four years, the noise at a single location would be more temporary and dissipate as construction crews progress along the Project's route.

7.2.5.2 Noise Related to Transmission Lines

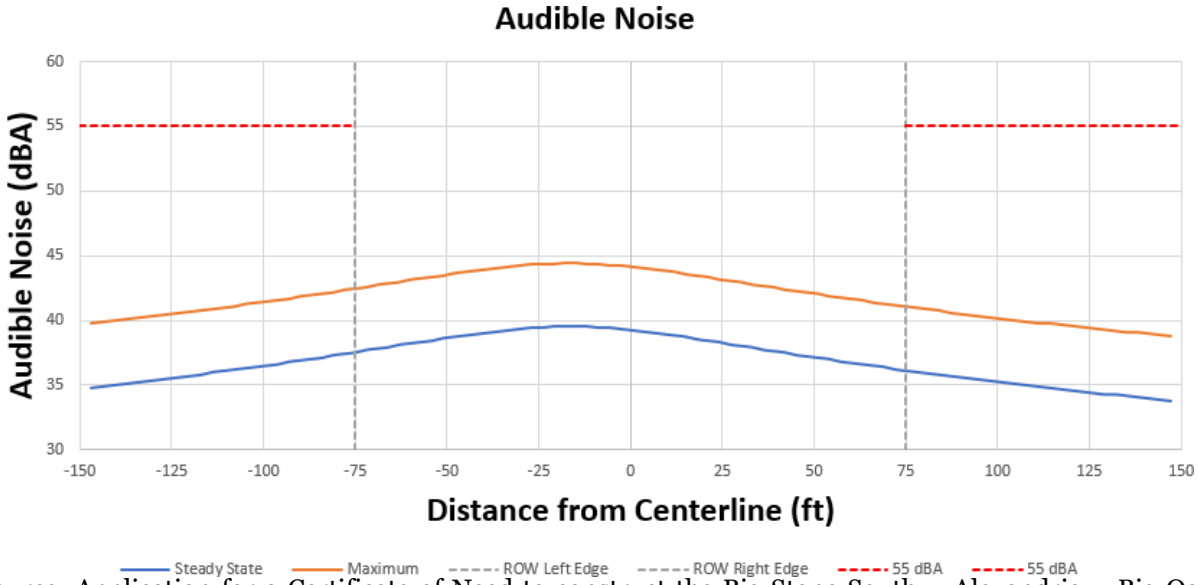
Noise levels during operation and maintenance of the Project will generally be minimal. Transmission conductors can create noise through the discharge of electrical energy, called 'corona,' which is audible in the direct vicinity of transmission line conductors during foggy, damp, or humid conditions. This noise is generally described as a low 'humming' or 'crackling' sound. During heavy rain conditions, the sound of rain often overpowers this noise, and during dry conditions, audible noise from transmission lines is barely perceptible to humans.

The Applicants performed a noise analysis for the Big Stone South – Alexandria – Big Oaks 345 kV Transmission Project, of which the Project is part of, by assuming that the noise levels generated will be the same at night as those generated during the daytime

and used a single-circuit design.[13] 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 portions of the Project surrounding residential housing and natural areas. NAC-1 has a daytime L50 limit of 60 dBA and a nighttime L50 limit of 50 dBA. NAC-3 will apply within agricultural areas and highway ROWs. NAC-3 has a daytime and nighttime L50 limit of 75 dBA. The proposed 345 kV line is anticipated to be below the MPCA noise limits for NAC-1, which are the most stringent MPCA noise limits (*see* **Figure 7-3**).

Figure 7-3 Calculated Audible Noise for Single-Circuit 345 kV Line at Nominal and Maximum System Voltage



Source: Application for a Certificate of Need to construct the Big Stone South – Alexandria – Big Oaks 345 kV Project, September 29, 2023 (MPUC Docket No. E002, E017, ET2, E015, ET10/CN-22-538).

7.2.5.3 Impacts and Mitigation

The noise associated with construction of the Project will be temporary in nature. To mitigate noise impacts associated with construction activities, work will be limited to daytime hours between 7 a.m. and 10 p.m. to the greatest extent practicable. Occasionally, there may be construction outside of those hours if the Applicants must work around customer schedules, line outages, or if the schedule has been significantly impacted due to permitting delays or other factors. If the Applicants determine

[13] Big Stone South – Alexandra – Big Oaks 345 kV Transmission Line Project Certificate of Need Application at 117-18, MPUC Docket No. E002, E017, ET2, E015, ET10/ CN-22-538.

construction is required during nighttime hours, they will coordinate with applicable stakeholders. To avoid violation of the nighttime noise standards, the Applicants will review construction equipment and related noise sources to evaluate the anticipated level of noise and identify specific mitigation measures. For example, construction equipment will be equipped with sound attenuation devices such as mufflers, the operation of construction equipment will be minimized as practicable, and construction of nighttime work will avoid NAC-1 areas to the extent practicable.

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

7.2.6 Aesthetics

This section describes the existing aesthetics in terms of the current visual landscape in and adjacent to the Project, which may be affected and visual resources visible from areas where the Project is likely to be within view, referred to as the "viewshed". 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. A project's viewshed will vary based on location. For example, 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. A landscape's character is primarily influenced by elements such as topography, vegetation, water resources, existing development, and infrastructure.

As previously discussed, topography significantly influences the quantitative extent and analysis of a viewshed in an area. The topography of the Project Study Area is largely flat, with areas of rolling plains interspersed throughout the region. In the proximity of the major waterbodies crossed by the Project, the terrain transitions into undulating topography, featuring occasional hills and slopes to gradual depressions and more defined valleys. Apart from these elevated regions, the topography within the Project Study Area typically spans from approximately 1,000 to 1,100 above mean sea level.

Vegetation can influence the aesthetics of landscapes by acting as natural viewshed barriers to anthropogenic buildings, enriching the intrinsic beauty of areas that might otherwise be affected by human activities, and supporting wildlife, which adds its own allure to the environment (Inglis et al. 2022). The vegetation within the Project Study Area primarily consists of cultivated crops and meadows. In areas with existing utility

ROWs, managed scrub-shrub species are likely to include oaks (*Quercus spp.*), willows (*Salix spp.),* alders (*Alnus spp.*), maples (*Acer spp.),* birches (*Betula spp.),* and dogwoods (*Cornus spp.)* at managed heights of 25 feet or less (MDNR 2024g). In wetland areas, hydrophytic plants such as sedges (*Carex spp.*), rushes (*Juncus spp.),* and cattails (*Typha spp.)* are expected to occur at heights less than six feet (Smith 2018, MDNR 2024g). The dominant upland herbaceous groundcover, characteristic of the regional environment, likely includes brome grasses (*Bromus spp.),* oats (*Avena spp.),* and foxtails (*Alopecurus spp.),* which all occur at ground level (MDNR 2024g).

Water resources, especially lakes, make up a significant portion of Minnesota's landmass. Water resources influence local aesthetics and contribute to attractive viewsheds, encompassing both the waterbody itself and the surrounding terrestrial landscapes. Whether lakes, rivers or streams, these water resources generally offer expansive and far-reaching viewsheds of the immediate area, making them vulnerable to both minor and major viewshed impacts from projects or vegetation removal.

The Route Options are in proximity to several municipalities but most of the land crossed is agricultural. While predominately cultivated crops, the landscape is already scattered with various buildings, including irrigation systems, grain handling systems, silos and energy infrastructure. Throughout the Project Study Area, rural residences and farm buildings (inhabited and uninhabited farmsteads) are dispersed along rural county roads. The visual character of a landscape is also largely influenced by the presence of the built environment. 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. As noted in **Section 7.2.3**, while there are residences within 500 feet of the Route Options, the closest residence to any Route Option is more than 75 feet away, with most being over 100 feet away (distances to residences by Route Option are listed in **Appendix C**).

There is existing HVTL infrastructure, which visually altered the landscape upon its construction, within the Project viewshed. These include: five HVTLs within the Route Width and 3.2 miles paralleled by Route Option South 1; three HVTLs within the Route Width and 8.6 miles paralleled by Route Option South 2; three HVTLs within the Route Width and 1.5 miles paralleled by Route Option Central 1;four HVTLs within the Route Width and 0.8 miles paralleled by Route Option Central 2; two HVTLs within the Route Width and no HVTLs paralleled by Route Option North 1; and three HVTLs within the Route Width and 1.3 miles paralleled by Route Option North 2. Existing HVTLs are shown in **Appendix D-1, Appendix D-2,** and **Appendix D-3**.

Various roads, highways, structures and utilities such as residences, farmsteads, communication towers, and distribution and transmission lines are visible within the Project Study Area. **Appendix C** includes linear length paralleling existing transmission lines, roads and railroads.

The Project Study Area includes several scenic byways, which are public roadways located in areas with regionally significant scenic, natural, recreational, cultural, historic, or archaeological resources (MnDOT 2024a). These scenic byways can be designated at either the national or state level, and in some cases, they receive both designations. There are 22 state and national scenic byways in Minnesota; three of which are within the Project Study Area. These include the Highway 75 King of Trails Scenic Byway (consisting of Highway 75), the Glacial Ridge Trail Scenic Byway (consisting of Highways 8, 19, and 28), and the Minnesota River Valley National Scenic Byway (consisting of Highway 7) (MnDOT 2024b; Minnesota Geospatial Commons [MNGC] 2024a).

The Highway 75 King of Trails Scenic Byway is a state designated scenic byway stretching 414 miles along Highway 75 in Minnesota's western and southern borders (Explore Minnesota 2024a). Highway 75 originates in Winnipeg, Manitoba, Canada, and ends at the Gulf of Mexico in Galveston, Texas. Within the Minnesota section of the byway, the landscape is characterized by expansive prairies and abundant farmlands, offering scenic views of the state's rich agricultural heritage (Explore Minnesota 2024a). This scenic byway is crossed by Route Options South 1 and South 2.

The Glacial Ridge Trail Scenic Byway, a state-designated scenic byway, spans 245 miles along Highways 8, 19, and 28 in central Minnesota (Explore Minnesota 2024b). Travelers on the Glacial Ridge Trail can view diverse landscapes featuring rolling terrain, lakes, forests, prairies, and farmland (Explore Minnesota 2024b). Portions of the Glacial Ridge Trail Scenic Byway are crossed by Route Option North 2.

The Project Study Area encompasses several nationally designated trails, part of a multi-discipline system designed to offer outdoor recreational opportunities and promote access to the nation's natural and historic resources (Congressional Research Service 2023; National Recreation Trail 2023; USGS 2024a). Eleven trails intersect with the Project Study Area, encompassing both terrestrial and aquatic complexes. These include the Appleton Area Recreational Park, Chippewa River, Froland Trail, Granite Outcrop Trail, Kaercher Hiking Trail, Minnesota River, Minnesota River State Trail, Pomme de Terre River, Prairie Pothole Handicap Accessible Trail, Prairie Pothole Trail, and Sellin Trail (USGS 2024a). The Ortonville to Highway 40 segment of the Minnesota River State Water Trail is crossed by both Route Option South 1 and South 2. This portion of the

Minnesota River State Water Trail also includes the Pomme de Terre State Water Trail. The Minnesota River is also crossed by Route Options South 1 and South 2.

The MDNR oversees Minnesota State Trails, which are part of a statewide system designed to provide recreational opportunities to the public for year-round use (MDNR 2024h). There are 25 major state trails covering over 1,300 miles across Minnesota (MDNR 2024h). Within the Project Study Area, one state trail, the Minnesota River State Water Trail, is crossed by Route Option South 1 (MNGC 2024b) (*see* **Appendix D-1**, page 1). No other state trails are located within the Project Study Area or crossed by any of the Route Options (MNGC 2024b).

7.2.6.1 Impacts and Mitigation

Transmission lines have the potential to affect the aesthetics of an area if they contrast with the surrounding landscape or designated scenic resources (e.g., federally or state-designated trails and byways).

The Project will result in an alteration of the current landscape through construction of monopole, double-circuit structures of approximately 120 to 180 feet in height. The Applicants developed the Route Options to parallel existing linear infrastructure (e.g., roadways, electric transmission and distribution lines) to minimize visual disruptions in the predominantly rural landscape to the extent practicable. Paralleling existing infrastructure groups these features into common corridors and helps to minimize the amount of cleared linear corridors that would otherwise fragment the existing landscape. The transmission line may be visible from municipalities near the Route Options, but the transmission line would be similar to existing infrastructure in these communities.

By routing along linear features and avoiding existing residences where practicable, the Applicants have minimized impacts to the viewshed from residences to the greatest extent possible. However, given the relatively flat landscape in the Project Study Area, the transmission line would likely be visible from residences and passersby on local roadways who could experience more significant impacts.

The Route Options may cross county ditches, rivers, streams, and tributaries including the Upper Minnesota River, Minnesota River, Stony Run Stream, Long Lake Creek, Pomme de Terre River, Chippewa River, Little Chippewa River, Long Prairie River; and numerous unnamed streams, tributaries, and county ditches. The proposed double circuit structures will be visible from these features but the viewshed impacts are anticipated to be minor and similar to other infrastructure in these areas.

Measures to minimize potential impacts to aesthetic resources may include the following:

- Where feasible, the location of structures and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.
- Structure types (designs) will be uniform to the extent practical. In general, the Applicants anticipate using monopole steel structures ranging in height from approximately 120 feet to 180 feet.
- Structures will utilize Corten steel (i.e., self-weathering steel) to have a dark brown matte finish to minimize sunlight reflections that could be visible to nearby landowners and commuters using nearby roadways.
- Care will be used to preserve the natural landscape; construction and operation will be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings. During operation of the Project, clearing of trees and shrubs will be conducted only as necessary per the NERC standards and to allow safe operation and inspection of the Project.

7.2.7 Socioeconomics

The socioeconomic analysis analyzed the Project Study Area, which includes Big Stone, Swift, Stevens, Pope, and Douglas counties in Minnesota. The existing socioeconomic conditions within the Project Study Area are reported based on data from the United States Census Bureau's (USCB) 2020 Decennial Census and 2018-2022 American Community Survey 5-Year Estimates. Data is reported at the county level to characterize the socioeconomic conditions along the Route Options and at the state level for the purpose of comparison (USCB 2024a). Additional details on the demographics of these communities are provided in the subsequent **Section 7.2.8**.

The five counties in the Project Study Area have small populations compared to the State of Minnesota as a whole, comprising 1.3 percent of the State's total population (*see* Table 7.2-18). Minnesota experienced a population change of 7.6 percent between 2010 and 2020. At the county level, population change ranged from 8.3 percent growth in Douglas County to a 2.0 percent decline in Big Stone County during the same time period. Population density is greatest in Douglas County, the northern portion of the Project Study Area, but overall population density declines significantly as the Project moves southwest towards South Dakota (USCB 2024a).

In the State of Minnesota, the top three industries for the civilian employed population 16 years of age and over are educational services, health care and social assistance (25.1 percent); manufacturing (13.4 percent); and retail trade (11 percent) (USCB 2024b). The top industries for the five counties in the Project Study Area are educational services, health care and social assistance; manufacturing; retail trade; and agriculture, forestry, fishing and hunting, and mining (Table 7.2-18) (USCB 2024c, d, e, f, g).

Average median household incomes in the Project Study Area range from $58,362 in Swift County to $72,472 in Douglas County. Generally, the counties in the Project Study Area have a median income lower than the State of Minnesota, which has a median income of $84,313 (USCB 2024c, d, e, f, g). The unemployment rate in the Project Study Area ranges from 2.37 percent in Stevens County to 3.38 percent in Big Stone County (Minnesota Department of Employment and Economic Development [MNDEED] 2024). Big Stone, Pope, and Swift Counties have an unemployment rate higher than the State of Minnesota (2.82 percent). Persons in poverty in the Project Study Area ranges from 8.7 percent in Douglas County to 11.3 percent in Big Stone County. Three out of the five counties within the Project Study Area have a percentage of persons in poverty higher than that of the State of Minnesota (9.6 percent) (USCB 2024c, d, e, f, g). Table 7.2-18 includes population, income, and employment information for the counties in the Project Study Area.

Table 7.2-18 Socioeconomic Characteristics in the Project Study Area

Location	Project Segment	2010 Census Population[1]	2020 Census Population[1]	Population Change[1]	Median Household Income (in 2022 Dollars), 2018-2022[1]	2023 Unemployment Rate[2]	2022 Largest Employment Industries[3]
State of Minnesota	N/A	5,303,925	5,706,494	7.6%	$84,313	2.82%	E, M, R
Big Stone County	South Segment	5,269	5,166	-1.95%	$63,024	3.38%	E, A, R
Douglas County	North Segment	36,009	39,006	8.32%	$72,472	3.13%	E. M, R
Pope County	Central Segment and portions of the North Segment	10,995	11,308	2.85%	$71,212	2.78%	E, M, R
Stevens County	Central Segment	9,726	9,671	-0.57%	$69,737	2.37%	E, A, M
Swift County	Central Segment	9,783	9,838	0.56%	$58,362	3.13%	E, A, M

Abbreviations: E = Educational services, health care and social assistance; M = Manufacturing; R = Retail trade; A = Agriculture, forestry, fishing and hunting, and mining.

[1]Source: USCB 2024a
[2]Source: MNDEED 2024
[3]Source: USCB 2024b, c, d, e, f, g.

7.2.7.1 Impacts and Mitigation

The Project, which is part of the larger Big Stone South-Alexandria-Big Oaks Project, will provide significant benefits to the existing energy system in the region by providing additional transmission capacity, increasing access for new generation, improving electric system reliability, reducing transmission congestion, and increasing access to low-cost energy.

The Project is expected to create both short- and long-term positive impacts to the local economy. Impacts to social and economic resources from construction activities would be short-term during the construction phase. Local businesses, such as restaurants, grocery stores, hotels, and gas stations, may see increased business during this phase from construction-related workers. Local industrial businesses, including aggregate and cement suppliers, tree removal service providers, and road contractors may also benefit from construction of the Project.

Construction and operation of the Project would not directly result in a change in the population size or demographics of the counties in the Project Study Area. Construction of the Project is anticipated to last between three and four years. As discussed in **Section 3.8**, it is anticipated that construction of the Big Stone South to

Alexandria Project, which includes the Project, will employ approximately 100 to 150 construction workers.

The influx of construction personnel to the Project Study Area may result in a temporary increase in the need for temporary housing, but any increase would be spread out over the length of the Project and would not be expected to affect the availability of rental housing or temporary lodging (e.g., hotels, motels, campgrounds) in any one location. The construction and operation of either Route Option is not anticipated to create or remove jobs in the Project Study Area over the long term or result in the permanent relocation of individuals to or from the area.

The presence of additional workers and increased employment would result in a slight increase in retail sales in the Project Study Area due to purchases of lodging, food, fuel, construction materials (lumber, concrete, aggregate), and other merchandise. This increase in purchases in the Project Study Area, however, would likely be easily accommodated by current retail staffing. No additional permanent staff are expected for transmission line operations and maintenance. Therefore, the transmission line is not expected to change population trends, economic indicators, or employment over the long-term.

The construction and operation of the Project is expected to have minimal influence on the local (county and municipal) economies.

Construction of this Project 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 estimated to be between $5.1 - $5.9 million dollars annually; tax revenue will be split between the State, local jurisdictions, and school districts based on the investment in each taxing district and as specified by state law.

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

7.2.8 Environmental Justice

This analysis identifies environmental justice communities located near the Project to determine if the Project would disproportionately affect environmental justice communities.

The USEPA 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 (USEPA 2024).

In addition, the State of Minnesota has passed laws and established the MPCA's Environmental Justice Framework. Minn. Stat. § 116B.065, subd. 1(d), environmental justice is defined as:

> (1) the fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies; and
>
> (2) in all decisions that have the potential to affect the environment of an environmental justice area or the public health of its residents, due consideration is given to the history of the area's and its residents' cumulative exposure to pollutants and to any current socioeconomic conditions that could increase harm to those residents from additional exposure to pollutants.

The Environmental Justice Framework states that the MPCA "expects the fair treatment and meaningful involvement of communities of color, Indigenous communities, and low-income communities in agency actions and decisions that affect them. It is the policy of the MPCA that an outcome of its work, in addition to protecting and improving the environment and public health, must address environmental justice concerns" (MPCA 2022). The MPCA has developed an environmental justice mapping tool to identify environmental justice communities within the state of Minnesota (MPCA 2024b).

According to Minn. Stat. § 216B.1691, subd. 1(e), an "environmental justice area" is defined 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:

> (1) 40 percent or more of the area's total population is nonwhite;
>
> (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;
>
> (3) 40 percent or more of the area's residents over the age of five have limited English proficiency; or
>
> (4) the area is located within Indian Country (as defined in United State Code, title 18, section 1151).

The Applicants used the MPCA environmental justice mapping tool to identify environmental justice communities near the Project. The Project Study Area intersects 13

census tracts, as listed in Table 7.2-19 and shown in **Appendix L**. According to the MPCA mapping tool, five of the 13 census tracts are identified as environmental justice communities because of low income (Table 7.2-19 and **Appendix L**). None of the 13 census tracts meet the criteria for minority populations or limited English proficiency (Table 7.2-19 and **Appendix L**). The 13 census tracts do not include any federally recognized tribal areas or areas recognized as tribal areas by the MPCA mapping tool.

Table 7.2-19 Environmental Justice Census Tracts Within the Project Study Area

Census Tract Name	County	Minority[a]	Low Income[b]	Limited English Proficiency[c]	Within Indian Country	Environmental Justice Community
9703	Pope	No	No	No	No	No
9701	Pope	No	No	No	No	No
9704	Pope	No	No	No	No	No
9702	Pope	No	No	No	No	No
4507.03	Douglas	No	Yes	No	No	Yes
4509	Douglas	No	No	No	No	No
4508	Douglas	No	No	No	No	No
9503	Big Stone	No	Yes	No	No	Yes
9501	Big Stone	No	Yes	No	No	Yes
9604	Swift	No	Yes	No	No	Yes
9603	Swift	No	No	No	No	No
4803	Stevens	No	Yes	No	No	Yes
4801	Stevens	No	No	No	No	No

[a] 40% or more of population is non-white
[b] At least 35% of people reported income less than 200% of the Federal Poverty Level
[c] 40% or more of population has limited English proficiency

Source: MPCA 2024b.

7.2.8.1 Impacts and Mitigation

Based on the data provided by the U.S. Census Bureau and the MPCA, low-income populations will be crossed by all of the Route Options except for Route Option North 1. Connector Segment S16 and Connector Segment S17 are both within low-income census tracts. Connector Segment C11 is not within an environmental justice census tract. No minority census tracts or census tracts with 40 percent or more of the population with limited English proficiency were identified along the Route Options.

As described in **Sections 7.2.7, 7.2.10,** and **7.4.1** of this Application, the Project is not anticipated to result in adverse impacts to socioeconomics, recreation, air quality or climate. In addition, the Project is not expected to cumulatively contribute to disproportionate impacts that the environmental justice communities would have to bear. Therefore, the Project is not anticipated to disproportionately affect environmental justice communities or adversely affect any of the communities along the Route Options.

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 has already begun through Project public outreach, including press releases, Project information and update mailings, creating a Project website, and other efforts. The goals of this engagement includes developing an initial understanding of potential Project impacts, both beneficial and adverse; gathering preliminary feedback; and establishing an ongoing two-way engagement process.

Project outreach information was provided by the Applicants in English but can be made available in languages other than English upon request. Applicants' contact information is available in **Section 1.2**.

All of Minnesota's 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. Outreach to Tribal governments is described further in **Section 8**.

7.2.9 Cultural Values

Cultural values include those perceived community attitudes or beliefs that provide a framework for community unity. The Project spans multiple counties including Big Stone, Swift, Stevens, Pope, and Douglas. The Project Study Area is predominantly rural in nature but crosses through several urban/industrial areas including Alexandria and Glenwood. Corn and soybean crop production, livestock operations, and associated industries drive the local agricultural economy. Farming and protection of agriculture, the land, and the ability to continue to farm and support livelihoods through agriculture are strong values within the Project Study Area. This cultural value is still celebrated today at each of the counties' annual county fairs and city events.

Manufacturing, industrial, and service industries (e.g., restaurants, hotels, repair shops, convenience and retail stores) are concentrated in the municipal population centers dotted throughout the Project Study Area, with Alexandria representing the largest city within the Project Study Area. Alexandria is known for its livability, culture and heritage management, and community participation and empowerment and values a community that is sustainable, inclusive, healthy, and engaged (City of Alexandria 2018).

Numerous natural amenities, including lakes, rivers, and WMAs, near the Route Options attract local and regional recreational users (**Section 7.2.10**). These areas

provide important recreational opportunities such as fishing, hunting, and snowmobiling which are also part of the identity of area residents.

Tribal Nations with communities close to the Project Study Area include the Upper Sioux Community and the Lower Sioux Indian Community. The Minnesota River Valley is an area of cultural significance for the Upper Sioux Community Pezihutazizi Oyate and Lower Sioux Indian Community, as well as other Tribal Nations whose ancestors previously inhabited the Project Study Area. The Upper Sioux Community Pezihutazizi Oyate refers to the area surrounding the Minnesota River as Pezihutazizi Kapi (the Place where they dig for yellow medicine) (Upper Sioux Community Pezihutazizi Oyate, Undated). The Upper Sioux Community Pezihutazizi Oyate holds a traditional Wacipi (i.e., powwow) annually in Granite Falls on the first weekend in August. Wacipi is a cultural tradition that brings generations together to dance, sing, and celebrate their heritage. The Lower Sioux Indian Community are part of the Mdewakanton Band of Dakota and refer to the Minnesota River Valley as Cansa'yapi (where they marked the trees red) (Lower Sioux Indian Community, 2023). The Lower Sioux Indian Community manages the Lower Sioux Agency Historic Site in Morton, which is the site where the U.S. Dakota War started in 1862. The Lower Sioux Indian Community also holds an annual Wacipi in the Land of Memories Park in Mankato during the third weekend in September.

7.2.9.1 Impacts and Mitigation

Construction, operation, and maintenance of the Project is not expected to conflict with the cultural values along the Route Options. The Project Study Area is predominantly rural in nature with an agriculture-based economy and is anticipated to remain so after construction. None of these 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. The Applicants are committed to coordinating with Tribal Nations that may have an interest in the Project to avoid or minimize impacts on areas of cultural significance. Additional information about the Applicants' coordination with Tribal Nations is provided in **Section 8.1.3**.

7.2.10 Recreation

Recreational opportunities in the Project Study Area include use of public lands such as MDNR WMAs, AMAs, State Water Trails, USFWS WPAs, the Big Stone National Wildlife Refuge, state parks, county parks, golf courses, and snowmobile trails (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3**). Common recreational activities that occur in these locations include hiking, hunting, fishing, boating, snowmobiling, birdwatching, camping, archery, shooting, and golfing.

WMAs are public areas managed by the MDNR intended for the protection and production of wildlife species and their habitat. WMAs may be used by residents and tourists for hunting, fishing, trapping, and wildlife viewing.

AMAs are lake, river, and stream management areas intended for the preservation of water resources and the engagement in compatible outdoor recreational activities such as fishing, hunting, and wildlife viewing. They are administered by the MDNR.

WPAs are managed by the USFWS to protect breeding, forage, shelter, and migratory habitat for waterfowl or wading birds, such as ducks, geese, herons, and egrets. WPAs provide opportunities for viewing wildlife and intact ecosystems, as well as fishing, hunting, and trapping. The Project crosses multiple WPAs, as described below.

Many lakes, rivers, and streams are spanned or bordered by the Project. Multiple rivers are spanned by the Project along Route Options. The State of Minnesota has over 4,500 miles of designated state water trails. Lakes and rivers are also used for recreational activities such as fishing and swimming.

Wild and Scenic Rivers are managed by the MDNR to preserve the qualities that made the river eligible for Wild and Scenic River designation while still allowing recreational use of the river for activities like canoeing, kayaking, and fishing (MDNR, 2024a).

Scenic Byways are public roadways located in areas of regionally significant scenic, natural, recreational, cultural, historic, or archaeological resources (MnDOT, 2024b). The Project crosses two Scenic Byways, as described below.

In addition to public lands, several privately owned/operated recreational opportunities are present within the Project Study Area. Designated snowmobile trails throughout the area are open to the public and maintained by local organizations and private landowners during the winter months. Some of these trails are open to all terrain vehicles/off-highway vehicles during portions of the year. Privately owned shooting ranges within the Project Study Area are used for trap shooting, clay shooting, archery, and other related activities. Privately owned/operated campgrounds and resorts are present at many of the lakes within the Project Study Area.

There are no AMAs, Wild and Scenic Rivers, state parks, golf courses, or MDNR SNAs in or crossed by any of the Route Options, Segment Alternatives, or Connector Segments. However, there are WMAs, State Water Trails, WPAs, scenic byways, and snowmobile trails crossed by some of the Route Options, Segment Alternatives, or Connector Segments. A description of recreational features unique to individual

Segments and Route Options is presented below. Recreational features are also depicted in **Appendix D-1, Appendix D-2,** and **Appendix D-3**.

7.2.10.1 South Segment

The Ortonville to Highway 40 segment of the Minnesota River State Water Trail is crossed by both Route Option South 1 and South 2. This portion of the Minnesota River State Water Trail also includes the Pomme de Terre State Water Trail. Minnesota State Water Trails provide opportunities for public boating, kayaking, canoeing, and camping.

Route Option South 1 and South 2 cross a portion of Highway 75 that is designated as a Scenic Byway called the King of Trails Scenic Byway at Subsegment S2 and S10; respectively. The Highway 75 King of Trails scenic byway is a 414-mile-long byway that spans the western border of Minnesota from north to south.

There are no WMAs crossed by the South Segment. The recreational features unique to Route Options, the Segment Alternative, and Connector Segments in the South Segment are discussed below.

7.2.10.1.1 Route Option South 1

Route Option South 1 crosses the Big Stone Lake Sno-Rider and Ridge Runner snowmobile trails at multiple locations. The Big Stone Lake Sno-Rider snowmobile trails are part of a trail system maintained by the Big Stone Lake Sno-Riders group. The Ridge Runner snowmobile trails are maintained by the Ridge Runners Snowmobile and ATV club. Route Option South 1 Crosses One Big Stone County WPA Location.

7.2.10.1.2 Route Option South 2

Route Option South 2 crosses the Big Stone Lake Sno-Rider and the Ridge Runner snowmobile trails at multiple locations, as described above. Route Option South 2 also crosses the West Central Trailblazer snowmobile trail which is maintained by the West Central Trailblazers Snowmobile Club.

A portion of Route Option South 2 (Subsegment S10) is located adjacent to the Big Stone National Wildlife Refuge which includes multiple parcels totaling approximately 12,000 acres. The Big Stone National Wildlife Refuge offers a variety of recreational opportunities including nature tours, biking, non-motorized boating, cross country skiing, dog walking, and snowshoeing (USFWS 2024a).

Route Option South 2 crosses one Big Stone County WPA and one Swift County WPA.

7.2.10.1.3 Alternative Segment S18

No recreational areas are crossed by Alternative Segment S18.

7.2.10.1.4 Connector Segment S16

Connector Segment S16 crosses one Big Stone County WPA. No other recreational areas are crossed by Connector Segment S16.

7.2.10.1.5 Connector Segment S17

Connector Segment S17 crosses one Big Stone County WPA. No other recreational areas are crossed by Connector Segment S17.

7.2.10.2 Central Segment

Both Route Option Central 1 and Central 2 cross the White Bear WMA at Subsegment C6. White Bear WMA is located near Starbuck and encompasses 196.2 acres. This WMA provides wetland bird viewing and maintains native grass, wildflower, woody cover, and emergent wetland habitat (MDNR Undated (a)).

There are no State Water Trails or Scenic Byways crossed by the Central Segment.

The recreational features unique to Route Options and the Connector Segment in the Central Segment are discussed below.

7.2.10.2.1 Route Option Central 1

Route Option Central 1 crosses the Noordmans WMA at Subsegment C3, and the New Prairie WMA at Subsegment C5. The Noordmans WMA is located near Cyrus and consists of 317.7 acres of land with the Chippewa River flowing through it. This WMA provides habitat for various wildlife species with a focus on pheasant management (MDNR Undated(b)). The New Prairie WMA is also located near Cyrus and consists of 59.5 acres of land which includes an open water basin and emergent vegetation. This WMA is managed for wetland protection and duck and pheasant production. The New Prairie WMA also provides some hunting opportunities for ducks and pheasants (MDNR Undated(c)).

Route Option Central 1 crosses the West Central Trailblazer snowmobile trail (described in previous sections) at multiple locations. Route Option Central 1 also crosses one Pope County WPA.

7.2.10.2.2 Route Option Central 2

Route Option Central 2 crosses the West Central Trailblazer (described in previous sections) and the Northern Lights snowmobile trails at multiple locations. The Northern Lights snowmobile trail is located within Swift and Pope Counties and includes over 150 miles of trails.

Route Option Central 2 also crosses one Pope County WPA and one Swift County WPA.

7.2.10.2.3 Connector Segment C11

No recreational areas are crossed by Connector Segment C11.

7.2.10.3 North Segment

There are no State Water Trails crossed by the North Segment.

The recreational features unique to Route Options and the Segment Alternatives in the North Segment are discussed below.

7.2.10.3.1 Route Option North 1

Route Option North 1 crosses the Lowry WMA at Subsegments N1 and N2. The Lowry WMA is located near Lowry and encompasses 214.7 acres of land. This WMA is managed as migratory waterfowl habitat and provides winter cover for pheasants and deer (MDNR Undated(d)).

Route Option North 1 crosses the West Central Trailblazer (described in previous sections) and the Douglas Area snowmobile trails at multiple locations. The Douglas Area snowmobile trails are operated and maintained by the Douglas Area Trails Association and consist of a 368-mile network of trails in west central Minnesota.

Route Option North 1 does not cross any WPAs.

7.2.10.3.2 Route Option North 2

Route Option North 2 crosses Forada WMA at Subsegment N6. The Forada WMA is located near Forada, Minnesota and consists of 829.4 acres of land providing habitat for deer, pheasants, and turkeys (MDNR Undated (e)).

Subsegments N6 and N8 of Route Option North 2 each cross a portion of State Highway 29 that is designated as a Scenic Byway called the Glacial Ridge Scenic Byway. The Glacial Ridge Scenic Byway is a 220-mile-long route in west central Minnesota.

Route Option North 2 crosses the West Central Trailblazer and the Douglas Area snowmobile trails at multiple locations (described in previous sections).

Route Option North 2 also crosses one Douglas County WPA and one Pope County WPA.

7.2.10.3.3 Segment Alternative N9

Segment Alternative N9 crosses the Lowry WMA, which is described in previous sections.

Segment Alternative N9 crosses the West Central Trailblazer snowmobile trail (described in previous sections) at multiple locations. No additional recreational features are crossed by Segment Alternative N9.

7.2.10.3.4 Segment Alternative N10

No recreational areas are crossed by Segment Alternative N10.

7.2.10.3.5 Segment Alternative N11

Segment Alternative N11 crosses the Douglas Area snowmobile trail (described in previous sections) at multiple locations. Segment Alternative N11 also crosses one Douglas County WPA. No additional recreational features are crossed by Segment Alternative N11.

7.2.10.4 Impacts and Mitigation

Impacts to recreation along the Route Options would differ depending on the type and number of recreational facilities/lands crossed. All Route Options cross WPAs and snowmobile trails, which are present within several areas of the Project's Study Area. Route Options South 1 and South 2 cross the Minnesota State Water Trail. Route Options Central 1, Central 2, North 1, and North 2 cross WMAs. A portion of Route Option South 2 (Subsegment S10) is adjacent to the Big Stone National Wildlife Refuge but does not cross it.

Construction of the Project is not anticipated to affect public access to any of the nearby recreational areas identified. Impacts to recreation areas would mostly be related to Project construction. Most impacts would be minimal and temporary during the construction phase of the Project. The Applicants will attempt to avoid or limit trail closures to the maximum extent practicable and will use conductor support structures for safety guides over roads or utilize helicopters for stringing activities where possible.

Temporary impacts may include tree clearing, use of heavy equipment (noise and fugitive dust), and lighting that may disturb wildlife, habitat, natural areas, and user enjoyment. Temporary disturbance to hunters, anglers, wildlife observers, and trail users may occur during the construction phase of this Project. Impacts may depend on timing and duration of the construction activities. Disturbances may impact the enjoyment of recreational areas surrounding nearby WPAs, WMAs, and other recreational facilities. Disturbance will be minimal, localized to designated construction areas, and temporary during the Project's construction phase. Temporary closures may occur where ROW span or border trails, which could impact hikers, snowmobilers, and/or ATV users in some locations depending on the time of year. Additionally, temporary presence of construction

crews may impact the ability of recreators to hunt at some WPA/WMA along the Project due to safety concerns for construction crew members. Temporary impacts to hunting would be limited to the construction phase of the Project. The Applicants will continue to coordinate with local governments, the MDNR, and USFWS to ensure construction of the Project will not significantly impact nearby natural resources which could lead to additional impacts to recreation within the Project Study Area.

Impacts to recreation including the use of heavy machinery and land clearing are likely to increase noise and dust within vicinity of construction areas. These impacts may negatively impact enjoyment of nearby users during construction. However, these impacts would be temporary, and use of BMPs to limit noise and fugitive dust during construction would effectively mitigate their effects.

Impacts during construction would be minimized through the use of BMPs and construction timing restrictions, where appropriate. Additionally, the Applicants' routing selection process, undertaken with extensive stakeholder input, endeavored to have each of the Route Options follow existing road and transmission corridors whenever possible, to minimize the potential for new disruptions to recreational uses. Mitigation measures for recreational areas, such as WPAs, that are classified as Minnesota Biological Survey (MBS) Sites of Biodiversity Significance are further described in **Section 7.4.12.3.1**.

Minimal impacts are anticipated during operation and maintenance of the Project. Minor impacts may include the visual presence of the structures/conductors and any noise generated by the transmission line. These impacts would be permanent within the vicinity of the Project. Temporary impacts during operation/maintenance may include increased noise levels during any required maintenance activities when necessary.

7.2.11 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.

7.2.11.1 Police, Fire, and Ambulance Service

Public services near the Project are provided by local law enforcement and emergency response agencies located in nearby cities and counties. The county sheriff's offices, state highway patrols and municipal police departments provide law enforcement in the area. Big Stone, Swift, Stevens, Pope, and Douglas Counties in Minnesota all have well-equipped sheriff departments that provide services to their respective counties.

Additionally, the cities of Hancock, Glenwood, Ortonville, Starbuck and Alexandria have local police departments.

Emergency fire response services are provided by city and community fire departments. Alexandria, Glenwood, Starbuck, and Morris have paid fire departments that service surrounding cities and townships. Lowry, Odessa, Hancock, Benson, Holloway, Correll, Clontarf, Danvers, Cyrus, Kensington and Ortonville have volunteer fire departments (Minnesota Firefighters 2023).

Ambulance primary service areas (districts) would provide emergency medical services (EMS) to the Project (EMS Regulatory Board 2024). Big Stone County has three ambulance districts; Swift County has four ambulance districts; Stevens County has one ambulance district; Pope County has three ambulance districts; and Douglas County has four ambulance districts. Ambulance services in the Project Study Area include Glacial Ridge Ambulance, Centracare Emergency Medical Services, Stevens County Ambulance Service, Ortonville Ambulance Service, and North Ambulance of Douglas County in the cities of Benson, Glenwood, Starbuck, Ortonville, and Alexandria (USGS 2024b). Combined fire and ambulance services are provided by the Odessa Fire Department, Ortonville Fire Department, Alexandria Fire Department, and Hancock Fire Department. The Ortonville Hospital in Ortonville, the Benson Hospital Ambulance Service in Benson, Glacial Ridge Ambulance in Starbuck and Glenwood, and Douglas County's North Memorial Ambulance in Alexandria provide emergency helicopter transport for patients. Emergency medical response is also available from local hospitals and medical centers described in **Section 7.2.11.2**.

Allied Radio Matrix for Emergency Response (ARMER) towers are a network of radio towers and radio transmission equipment used for emergency response services throughout the state of Minnesota (Minnesota Department of Health ([MDH] 2022). The cities of Glenwood, Starbuck, Benson, Holloway, and Correll have active ARMER towers in the Project Study Area.

7.2.11.2 Hospitals

Multiple hospitals and small medical centers are located within ten miles of the Project and would provide medical care to the Project Study Area. Nearby hospitals and medical centers include the Essentia Health Holy Trinity Hospital in Graceville, Ortonville Area Health Service in Ortonville, the Appleton Municipal Hospital in Appleton, Swift County Benson Health Services in Benson, the Stevens Community Medical Center in Morris, the Glacial Ridge Hospital in Glenwood, and Alomere Health in Alexandria, Minnesota (MDH 2020).

7.2.11.3 Water and Wastewater Services

In the rural areas within the Project Study Area, residents often use privately-owned septic systems and wells. The Cities of Alexandria, Glenwood, Ortonville, Odessa, Cyrus, Lowry, Benson and Starbuck provide municipal water (MDH 2024) and sanitary sewer services (MPCA 2024a).

7.2.11.4 School Districts

There are 14 Minnesota school districts in the counties that make up the Project Study Area. Seven school districts in Minnesota are located within the Project Study Area, as shown in Table 7.2-20.

Table 7.2-20 School Districts Crossed by the Route Options

Route Option	School Districts (SD) Crossed
South 1	Benson Public School District (SD 777) Hancock Public School District (SD 768) Lac qui Parle Valley School District (SD 768) Ortonville Public School District (SD 2903)
South 2	Ortonville Public School District (SD 2903) Lac qui Parle Valley School District (SD 768) Hancock Public School District (SD 768)
Central 1	Hancock Public Schools District (SD 768) Minnewaska School District (SD 2149) Morris Area Public Schools District (SD 2769)
Central 2	Benson Public Schools District (SD 777) Hancock Public Schools District (SD 768) Minnewaska School District (SD 2149) Morris Area Public Schools District (SD 2769)
North 1	Alexandria Public School District (SD 206) Minnewaska School District (SD 2149)
North 2	Alexandria Public School District (SD 206) Minnewaska School District (SD 2149)

Source: Minnesota Department of Education, 2023

7.2.11.5 Utilities

Existing electric utilities in the vicinity of the Route Options are provided by Agralite Cooperative, Alexandria Light and Power, Benson Municipal Utilities, Kandiyohi Power Cooperative, Ortonville Water and Light Department, Otter Tail Power Company, Runestone Electric Association, Traverse Electrical Coop, Stearns Electric Association, and Xcel Energy (MNGC 2024). Liquid and natural gas pipelines within the Project Study Area are owned by Amoco, Dome Pipeline Company, Northern Natural Gas Company, and Williams Pipeline Company (Pipeline and Hazardous Materials Safety Administration [PHMSA] 2014).

The Route Options cross several existing utility lines as described below and as shown in **Appendix D-1, Appendix D-2,** and **Appendix D-3** (United States Department of Homeland Security [DHS] 2023).

- Route Option South 1 follows an existing Great River Energy 115 kV overhead line immediately south of Ortonville and then continues along a Western Minnesota 115 kV overhead line route east of Ortonville, Minnesota for approximately 1.4 miles and follows another 41.6 kV overhead line route, owned by Great River Energy, for approximately two miles northwest of Correll, Minnesota. This Option also crosses another existing Western Minnesota 115 kV overhead line route in Ortonville directly southwest of US Highway 75 and east of the South Dakota/Minnesota border.
- Route Option South 2 follows an overhead 41.6 kV line route owned by Great River Energy from US Highway 12 north approximately 6.5 miles. This Option also crosses an existing Western Minnesota 115 kV overhead line route in Ortonville directly southwest of US Highway 75 and east of the South Dakota/Minnesota border.
- Route Option Central 1 crosses Northern Natural Gas pipelines in three locations. One crossing is in an agricultural field approximately 2.2 miles northeast of Byrne Lake, and the other two crossings are three miles northeast and 0.5 mile northwest of Hancock. Route Option Central 1 also crosses an Alliance Pipeline system 1.6 miles southwest of Hancock. Route Option Central 1 crosses an existing Great River Energy 115 kV overhead transmission line in one location near the intersection of 410th Ave/250th St. At this location, this Route Option also follows an existing Great River Energy 115 kV overhead line route for approximately 1.5 miles (east-west). Near the intersection of State Highway 9/265th St, Route Option Central 1 crosses an additional existing Otter Tail 41.6 kV overhead power line. Route Option Central 1 also crosses a Western Area Power Administration (WAPA) 230-kV overhead transmission line approximately 2.5 miles northwest of Byrne Lake in an agricultural field between 320th Street and 330th Street.
- Route Option Central 2 crosses Northern Natural Gas pipelines in three locations: one crossing is one mile north of the intersection of State Highway 9 and 320th Street, another is 0.4 miles east of County Road 1 and

210th Street, and the third crossing is 0.6 mile north of the intersection of State Highway 28 and 340th Street. One additional crossing is the Alliance Pipeline System pipeline 0.3 mile south of the intersection of State Highway 9 and 320th Street. Route Option Central 2 crosses several existing overhead transmission lines. One crossing involves a Great River Energy 115 kV overhead line and is approximately two miles southeast of Hancock. Another crossing is of the WAPA 230 kV line at the intersection of 60th Street NW and 90th Avenue NW. This Option also follows an existing Otter Tail 41.6 kV overhead line for approximately 2.5 miles along 60th St NW. Option Central 2 also crosses two separate Great River Energy 115 kV Lines further north, once at the intersection of 250th Street and 410th Avenue and again approximately 0.5 mile due west of the same intersection.

- Route Option North 1 crosses an existing High Voltage Direct Current overhead power line owned by Nexus Line, LLC in an agricultural field approximately one mile southwest of Lowry. Route Option North 1 also crosses a 115-kV overhead transmission line owned by Western Minnesota approximately 0.3 mile south of I-94 near Alexandria. Route Option North 1 does not cross any pipelines.
- Route Option North 2 crosses a Northern Natural Gas Company gas pipeline in three locations, one crossing is approximately 0.5 mile west of State Highway 114 in an agricultural field, another crossing is 0.5 mile west of the intersection of 155th Street and 240th Avenue, and the third is approximately 0.2 mile northwest of the intersection of Cross County Lane Southwest and State Highway 29 South. Route Option North 2 crosses an existing High Voltage Direct Current overhead powerline owned by Nexus Line, LLC approximately 0.3 miles north of County Road 28 in Leven Township, Minnesota. This Route Option also follows an existing 115 kV overhead transmission line owned by Western Minnesota for approximately 1.4 miles southeast from the Alexandria substation. This same 1.4 mile stretch also follows the existing 345 kV overhead transmission line southeast of Alexandria.

7.2.11.6 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 storm sewers, streets and sidewalks, parks, public landscaping, and water mains.

Additional public facilities within incorporated areas in the Project Study Area include swimming pools, ice rinks, parks, and libraries.

7.2.11.7 Impacts and Mitigation

Potential impacts to public utilities would be most likely to occur during ground disturbance activities for Project construction. Use of heavy equipment during construction presents the potential for injuries such as falls, equipment-use related injuries, or electrocution. The presence of additional construction workers could result in the need to respond to emergencies associated with construction of the Project and the temporary increase in population. Local law enforcement resources may be utilized for traffic control and law enforcement during construction activities.

Operation of a transmission line presents a potential risk to public safety in the unlikely event that 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 could require use of local emergency services such as police, fire, ambulance, or hospitals. However, local emergency services are adequate throughout the Project Study Area to manage the minor increases for these services during construction and operation. Therefore, impacts to the availability of emergency services as a result of the Project are not anticipated. In addition, no impacts to ARMER towers or other associated radio transmission equipment are anticipated as a result of the Project.

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

Constructing the Project may require short duration transmission line outages while crews are constructing the Project over or under other existing transmission lines. Depending on the line crossing configuration, the Applicants anticipate needing short line outages when crossing other existing lines to ensure safe construction practices. The contractor will request these outages with the Applicants, and the Applicants will coordinate with the owner of the existing lines that need to be crossed. Outages will be submitted by the owner of the existing lines and granted in accordance with the requirements of MISO. It should be noted that a line outage needed for a utility line crossing does not result in a “customer outage”. Due to the multiple interconnections and redundancy of the broader transmission grid, transmission line outages will be managed to avoid customer outages. Customer outages are not expected since customers will still

receive power from an alternative transmission path. At the Alexandria Substation, short duration outages of specific pieces of equipment will be required to connect the Project into the substation and for relay and communication testing. Outages at the Alexandria Substation will likewise be submitted and granted by MISO with no customer outages expected.

Although unlikely, damage to existing pipelines could occur during construction 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. 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). If needed, the Applicants will work with the existing underground utilities on a case-by-case basis.

The Applicants will 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 them or 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.

7.2.12 Radio, Television, Cellular Phone, and Global Position Systems

7.2.12.1 Existing Radio, Television, Cellular Phone, and Global Positioning System

7.2.12.1.1 Radio

Amplitude modulation (AM) and frequency modulation (FM) radio broadcasting stations that operate or can be heard within the Project Study Area include (but are not limited to):

- Alexandria Community Radio Educational Organization, Inc., KLKX-LP (98.5 FM Alexandria).
- We Have This Hope Christian Radio, Inc., KSWJ (90.9 FM Alexandria).
- HBI Radio Alexandria, LLC, KULO (93.3 FM Alexandria).
- Leighton Radio Holdings, Inc., KXRZ (99.3 FM Alexandria).

- Iowa City Broadcasting Company, Inc., KRVY-FM (97.3 FM Starbuck).
- Leighton Radio Holdings, Inc., KXRA (1490 AM Alexandria).

AM radio is a medium-frequency analog signal (typically) that operates between approximately 500 kilohertz (kHz) and 1700 kHz (1.7 megahertz [MHz]). This signal is susceptible to electromagnetic interference (EMI) from transmission lines and may be distorted (static sound) under or near a transmission line. In compliance with Federal Communications Commission regulations, transmission line engineers will evaluate the projected amount of AM radio interference projected due to corona activity and select conductors that reduce any level of interference to an acceptable level adjacent to the ROW.

FM radio in the US operates in the very high frequency (VHF) band between 88 and 108 MHz. Due to the modulation techniques used for FM, as well as the higher frequency, EMI from transmission line corona historically has not caused FM radio interference. Additionally, over the past decade, many FM stations have moved to digital FM (often called HD Radio), which (similar to Digital television [DTV]), is more immune to interference.

7.2.12.1.2 Television

There are 18 local television stations in the Project Study Area. Television broadcasts are received from local stations in the Project Study Area and other cities in Minnesota and neighboring states. These channels are received in cities and towns in the Project Study Area including (but not limited to) Alexandria, Ortonville, Odessa, Correll, Holloway, Danvers, Clontarf, Benson, Murdock, Starbuck, Villard, Forada, Kensington, Solem, and Hoffman, Minnesota.

Over-the-air television signals in the US operate in the VHF and ultra high frequency (UHF) bands (between 54 MHz and 746 MHz). VHF signals used to experience some EMI from transmission lines when located immediately adjacent to the ROW, with increased effects when they are analog signals. However, since the 2009 US transition to DTV, interference on broadcast television is rare. Additionally, many stations have moved out of the lower-VHF band as UHF band stations are less prone to interference. Although uncommon, if interference is found, relocating the antenna, or moving to cable television or similar technologies are options to mitigate the interference.

7.2.12.1.3 Cellular Phone

There are eight registered cellular phone towers located within the Project Study Area. Cellular phone service providers that operate in the vicinity of the Project include

AT&T, Verizon, T-Mobile, and Cricket which offer service in the area and have stores located in Alexandria, Starbuck, Ortonville, Benson and other nearby locations.

US cellular networks operate between 600 MHz (UHF band) and 47 GHz band (for the highest speed 5G networks). These digital signals are far above the EMI frequencies produced by transmission line corona and thus should not be impacted by a transmission line. Additionally, it is common practice for cellular network providers to mount their antennas on transmission line structures directly, demonstrating the lack of impact.

7.2.12.1.4 Global Positioning Systems

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.

GPS signals operate in certain UHF bands between 1.1 and 1.6 GHz. Similar to cellular phones, the EMI from transmission lines will not impact GPS signal reception. However, the structures and conductors may have effects like trees, buildings or other line-of-sight obstructions. GPS devices continuously pull signals from multiple satellites, not just one. If farming equipment has a GPS unit, the equipment should work properly when underneath the transmission line with a similar degree of accuracy as to when not near a transmission line. Transmission line poles can occasionally partially block line-of-site communications between ground-based Real-Time Kinematic positioning GPS base stations and roving equipment. There is a potential for a signal to be temporarily blocked; but it should be expected to come back within a few seconds as the farm equipment continues to move past the pole. Alternatively, as with any other line-of-site obstruction, this issue can be overcome by relocating the base stations or using repeater stations.

7.2.12.2 Impacts and mitigation

No notable impacts to radio, television, cellular phones, or GPS units are expected from construction or operation of the Project. It is expected that any interference to radio signals will be less than the limits recommended by the Institute of Electrical and Electronic Engineers. While it is rare in everyday operations, four potential sources for interference do exist, including gap discharges, corona discharges, and shadowing and reflection effects.

Gap discharge interference is the most commonly noticed form of interference with radio and television signals and also typically the most easily fixed. Gap discharges are

usually caused by hardware defects or abnormalities on a transmission line causing small gaps to develop between mechanically connected metal parts. As sparks discharge across a gap, they create the potential for electrical noise, which can cause interference with radio and television signals in addition to audible noise. The degree of interference depends on the quality and strength of the transmitted communication signal, the quality of the receiving antenna system, and the distance between the receiver and the transmission line. Gap discharges are usually due to a maintenance issue, since they tend to occur in areas where gaps have formed due to broken or loose hardware (clamps, insulators, brackets). Because gap discharges are a hardware issue, they can be repaired relatively quickly once the issue has been identified. The Project hardware will be designed and maintained to minimize gap discharges.

Corona from transmission line conductors can also generate electromagnetic noise at the same frequencies that radio and television signals are transmitted. The air ionization caused by corona generates audible noise, radio noise, light, heat, and small amounts of ozone. The potential for radio and television signal interference due to corona discharge relates to the magnitude of the transmission line-induced radio frequency noise compared to the strength of the broadcast signals. Because radio frequency noise, like electric and magnetic fields, becomes significantly weaker with distance from the transmission line conductors, very few practical interference problems related to corona-induced radio noise occur with transmission lines. In most cases, the strength of the radio or television broadcast signal within a broadcaster's primary coverage area is great enough to prevent interference. Routine maintenance activities such as tightening loose hardware on the transmission line can help minimize corona noise. The Project hardware will be designed and maintained to minimize corona discharges.

There is the potential for AM radio interference to occur directly below transmission lines, but this effect will dissipate rapidly beyond the transmission line ROW. If radio interference from transmission line corona does occur for an AM radio station, satisfactory reception can be restored by appropriate modification of (or addition to) the receiving antenna system. The situation is unlikely, however, because AM radio frequency interference is typically localized to under a transmission line and within the ROW.

FM radio receivers usually do not pick up interference from transmission lines because:

- Corona-generated radio frequency noise currents decrease in magnitude with increasing frequency and are quite small in the FM broadcast band (88-108 MHz).
- The interference rejection properties inherent in FM radio systems make them virtually immune to amplitude-type disturbances.

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 (12,000-18,000 MHz), respectively. Digital and satellite transmissions are more likely to be affected by multi-path reflections (shadowing) generated by nearby transmission poles. Television interference due to shadowing and reflection effects is rare but may occur when a large transmission pole is aligned between the receiver and a weak distant signal, creating a shadowing effect. In the rare situation where a transmission line may cause interference within a station's primary coverage area, the problem can usually be corrected with the addition of an outside antenna. 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 immune to interference from electromagnetic noise.

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. Additionally, utilities regularly use GPS-based surveying methods under and around transmission lines and have not experienced interference. Because no impacts are anticipated, no mitigation measures are proposed.

If television or radio interference is caused by or from the operation of the Project in those areas where good reception was available prior to construction of the Project, Applicants will evaluate the circumstances contributing to the impacts and determine the necessary actions to restore reception to the present level. Potential mitigation measures may include making the appropriate modifications to the receiving antenna system.

In the unlikely event that the Project causes interference within a television station's primary coverage area, the Applicants will work with the affected viewers to

correct the problem at the Applicants' expense. This problem can usually be corrected with the addition of an outside antenna.

7.2.13 Transportation

The Project Study Area includes multiple roadways, railroads, airports, and airstrips. The description of these features and a discussion of potential impacts from construction and operation of the Project is presented below.

7.2.13.1 Roadways and Trails

The Route Options for the Project cross 136 roads, including three US trunk highways, five state highways, 24 county state aid highways, and 104 roads owned and operated at the township or municipal level. Roads are depicted on the detailed route maps (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3**).

The Application Alignment crosses various snowmobile trails in 40 locations. A description of the snowmobile trails crossed by each Route Option and potential Project impacts are included in **Section 7.2.10**.

A description of trunk highways crossed or paralleled by each Route Option is presented below in Table 7.2-21.

Table 7.2-21 Trunk Highway Crossings along the Route Options

Route Option	Lat/Long	MnDOT Trunk Highway Name	Crossing Length (feet)	Collocated[1] (Yes/No)	Collocation Length (feet)
North 1 and North 2	45.84394272/ -95.40747627	Interstate 94	4,024.5	Yes	4,024.5
North 2	45.83740465/ -95.39018452	MN Hwy 29	1,281.0	No	NA
North 2 and Segment Alternative N11	45.83898512/ -95.38068343	Interstate 94	1,228.3	Yes	1,228.32
Segment Alternative N11	45.83570779/ -95.37629127	Interstate 94	3,066.4	Yes	3,066.4
North 1	45.74322697/ -95.53278175	Intersection of MN Hwy 114 and Co Rd 76	MN Hwy 14 = 1,003.0 Co Rd 76 = 500.7	Yes	Co Rd 76 = 500.7
Segment Alternative N9	45.71362989/ -95.53324461	MN Hwy 114	11,955.5	Yes	11,955.5
Segment Alternative N9	45.71021265/ -95.53249309	Intersection of MN Hwy 55 and MN Hwy 114	1,257.8	Yes	MN Hwy 114 = 435.6 MN Hwy 55 = 822.2
North 1	45.71548403/ -95.54301296	MN Hwy 55	1,256.4	No	NA

Route Option	Lat/Long	MnDOT Trunk Highway Name	Crossing Length (feet)	Collocated[1] (Yes/No)	Collocation Length (feet)
North 2	45.72142303/ -95.34889238	Co Rd 28 (Pope Co)	1,002.3	No	NA
North 2	45.67775508/ -95.40493165	Adjacent to (north) of the intersection of MN Hwy 55 and MN Hwy 29	4,031.1	No	NA
North 2	45.67833904/ -95.52244775	MN Hwy 114	1,000.9	No	NA
Central 2	45.61450064/ -95.63479727	MN Hwy 28	1,003.7	No	NA
Central 1	45.61305091/ -95.67787961	MN Hwy 28	1,000.0	No	NA
Central 1	45.50610349/ -95.81135491	MN Hwy 9	1082.8	No	NA
Central 2	45.43788511/ -95.73992558	MN Hwy 9	1,489.1	No	NA
South 2	45.38252394/ -95.91389385	US Hwy 59	1,000.8	No	NA
South 1	45.28871759/ -95.91415657	US Hwy 59	1,000.1	No	NA
South 1	45.28894367/ -96.05746868	US Hwy 12	571.0	No	NA
South 2	45.29683701/ -96.27441399	US Hwy 12	16,544.6	Yes	16,544.6
South 2	45.27737954/ -96.4202177	US Hwy 75	1,009.9	No	NA
South 1	45.28786587/ -96.43208765	US Hwy 75 / Mn Hwy 7	1,183.0/ 472.4	No	NA

[1]To be conservative, the Applicants applied a 1,000 foot buffer (500 feet on either side) on all trunk highways for the collocation analysis. Areas of collocation were identified as places where the Route Width falls within the 1,000 foot trunk highway buffer and runs parallel to the trunk highway.

7.2.13.2 Average Annual Daily Traffic

Annual Average Daily Traffic (AADT) volumes were obtained for trunk highways crossed by, or running parallel to, the Route Options (Table 7.2-22). With the exception of I-94, average daily traffic volumes are generally low along the Project. AADT volumes are highest on I-94 as measured near Alexandria. Volumes are lowest along MN Highway 114 as measured near Lowry.

Table 7.2-22 Annual Average Daily Traffic on Trunk Highways Crossed by or Co-Located with the Route Options

Highway	Route Option	Measurement Location	AADT, vehicles per day	Traffic Count Year	County
US 75	South 1, South 2	South of MN 7 (Main St)	1,527	2022	Big Stone
US 12	South 1, South 2	West of US 59	1,036	2022	Swift
US 59	South 1, South 2	South of US 12	1,627	2022	Swift
MN 9	Central 1, Central 2	Northwest of CSAH 1 (Kerr Ave), East of Hancock	2,100	2020	Stevens
MN 28	Central 1, Central 2	East of County Road 81 (320th Ave)	2,000	2019	Pope
MN 114	North 1, North 2	North of MN 55	953	2021	Pope
MN 55	North 1	Northwest of MN 29	1,300	2020	Pope
MN 29	North 2	North of MN 55	6,000	2019	Pope
I-94	North 1, North 2	1.2 miles east of MN 29, south of Alexandria	17,864	2023	Douglas

Source: MnDOT 2019-2023

7.2.13.3 Railroads

The Route Options cross four active rail line subdivisions at 13 locations. Railroads are depicted on the detailed route maps (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3**). A description of rail lines crossed by each Route Option is presented below.

7.2.13.3.1 South Segment

One active rail line is crossed by Route Option South 1, the Burlington Northern Santa Fe (BNSF) rail line of the Appleton Subdivision (BNSF Appleton – State Line). This rail line also crosses Route Option South 2. No other active rail lines cross Route Option South 2. No active rail lines are crossed by Segment Alternative S18, Connector Segment S16, or Connector Segment S17.

7.2.13.3.2 Central Segment

One rail line is crossed by Route Option Central 1, the BNSF rail line of the Morris Subdivision (BNSF CP 98 – East Breckenridge). This rail line also crosses Route Option Central 2. No other active rail lines cross Route Option Central 1. No active rail lines are crossed by Connector Segment C11.

7.2.13.3.3 North Segment

One rail line is crossed by Route Option North 1, the SOO Line (SOO) rail line of the Elbow Lake Subdivision (SOO Glenwood – State Line). Segment Alternative N9 also

crosses this rail line. Route Option North 2 crosses this rail line in five locations. Segment Alternative N11 also crosses a SOO rail line of the Detroit Lakes (SOO West Glenwood – Thief River Falls) in two locations. No active rail lines are crossed by Segment Alternative N10.

7.2.13.4 Airports and Airstrips

Operation of transmission facilities can pose safety concerns near airports and airstrips. Airports, as defined by the state and the FAA, are areas of land or water that are used or intended to be used for the landing and takeoff of aircraft, and include the surrounding area used or intended to be used for airport buildings and facilities (14 Code of Federal Regulations (CFR) Part 1, § 1.1 and Minn. R. 8800.0100, subp. 3). As aircrafts takeoff and land at airports, transmission lines can pose hazards or affect maneuverability of aircraft if the structures encroach into the airspace. Federal Aviation Regulation Part 77 and Minn. R. 8800.1200 establish guidelines on heights for any structures that could endanger aircraft, which includes structures exceeding 200 ft above ground level (AGL) or the airport elevation (whichever is greater). None of the structures proposed for the Project are expected to exceed 200 feet. These guidelines impose stricter regulations for structures within a maximum distance of 20,000 ft (3.78 miles) of a public use or military airport.

A complete description and copy of the FAA and Minnesota Airport Zoning Standards can be found at 14 CFR Part 77 and Minn. R. 8800.1100. Additionally, all structures 200 feet AGL must be marked and lighted in accordance with FAA Advisory Circular 70/7460-1K, Obstruction Marking and Lighting.

Aerial crop dusting, which involves spraying fertilizers, herbicides, and pesticides from specialized aircraft, is an important part of agricultural activities in Minnesota, and may occur within the Project Study Area during construction and operation of the Project. Aircraft used in crop dusting may use airstrips in and surrounding the Project Study Area.

The Applicants developed the Route Options to minimize impacts to aviation facilities and aerial crop dusting operations. A description of airports and airstrips within approximately two miles of the Application Alignment for each Route Option is presented below.

7.2.13.4.1 South Segment

7.2.13.4.1.1 Route Option *South 1*

There are three airports within two miles of Route Option South 1: the Ortonville Municipal Airport (approximately one mile north), the Ortonville Hospital helipad

(approximately 1.9 miles north) and one private airstrip (approximately 1.1 mile south of Route Option South 1 between US Highway 12 and 40th Street SW near Holloway).

The Ortonville Municipal Airport is located at an elevation of 1,101 feet Above Sea Level. This airport is owned by the city of Ortonville and has two asphalt and turf airstrips (3,417 by 75 feet, and 2,175 by 275 feet) and a hangar and tie-down area available for single-engine aircraft.

The Ortonville Hospital helipad is intended for the emergency transport of patients to and from Ortonville Hospital.

7.2.13.4.1.2 Route Option South 2

There is one airport within two miles of Route Option South 2: the Ortonville Municipal Airport located approximately 1.7 miles north/northwest.

7.2.13.4.1.3 Segment Alternative S18

There are no airports within two miles of Segment Alternative S18.

7.2.13.4.1.4 Connector Segment S16

There is one airport within two miles of Connector Segment S16: the Ortonville Municipal Airport is approximately 1.3 miles north/northwest from Connector Segment S16.

7.2.13.4.1.5 Connector Segment S17

There are no airports within two miles of Connector Segment S17.

7.2.13.4.2 Central Segment

7.2.13.4.2.1 Route Option *Central 1*

There are two airports within two miles of Route Option Central 1: both are private airstrips on private land. One is approximately 0.25 mile west of Route Option Central 1(non-active airstrip) and the other is approximately 0.05 mile north/northwest (active airstrip). The nearest municipal airport is the Starbuck Municipal Airport located over three miles southeast of Route Option Central 1 in Starbuck, Minnesota.

7.2.13.4.2.2 Route Option Central 2

There are two airports within two miles of Route Option Central 2: both are private airstrips on private land. One is approximately 0.25 mile west of Route Option Central 2 (non-active airstrip) and the other is approximately 0.05 mile north/northwest (active airstrip). The nearest municipal airport is the Starbuck Municipal Airport located over three miles southeast of Route Option Central 2 in Starbuck, Minnesota.

7.2.13.4.2.3 Connector Segment C11

There are no airports within two miles of Connector Segment C11.

7.2.13.4.3 North Segment

There are no airports within two miles of Route Option North 1, Route Option North 2, Segment Alternative N9, Segment Alternative N10, or Segment Alternative N11. The nearest airport to the North Segment is the Glenwood Municipal Airport located over three miles southeast of Route Option 2 in Glenwood, Minnesota.

7.2.13.5 Impacts and Mitigation

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

7.2.13.5.1 Roadways and Trails

Construction activities will not permanently impact transportation. Construction could create a minor increase in traffic from construction vehicles and material/equipment delivery along these and other roadways within the Project Study Area; however, this increase would be temporary and return to normal conditions once construction activities are completed. Since the Alexandria Substation already has an access road, the only new permanent access road anticipated for the Project will be associated with the Regeneration Station. Line maintenance and construction activities at crossing locations could also cause temporary delays if the Applicants' or the Applicants' contractor's vehicles are present. To minimize overall impacts, the Applicants will limit vehicle traffic to the Project ROW and leverage existing access points to the greatest 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 constructed, the electrical conductors would be strung using a pulley system or a tensioner mounted on the back of a large piece of equipment (e.g. bulldozer, payloader or 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) would be reopened to allow normal traffic flow.

Any occupation of state highway ROW requires a Utility Permit from MnDOT, per Minn. R. 8810.3100-3600. Temporary occupation of state highways may occur during construction to meet safety requirements; however, no permanent infrastructure will be located within state highway ROWs. The Applicants have begun coordinating with MnDOT and will continue to work with MnDOT throughout the Route Permit process to ensure that the Project 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 before ROW clearing began or better. The Applicants will meet with MnDOT, township road supervisors, city road personnel, and/or county highway departments as necessary to address issues that may arise during construction with roadways and to ensure the roads are adequately restored after construction is complete.

Concerns related to construction along trails would be temporary, minor, and localized to areas where active structure installment and line stringing occurs along dedicated trail ROW, which could impact pedestrians, bikers, and ATV users (*see* **Section 7.2.10**). Appropriate signage will be placed along trails to warn trail users of ongoing construction. The Applicants will attempt to avoid or limit trail closures to the maximum extent practicable and will use conductor support structures for safety guides over roads or utilize helicopters for stringing activities where possible.

7.2.13.5.2 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 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.

7.2.13.5.3 Airports and Airstrips

No impacts to FAA-registered commercial or private airports or airstrips are anticipated as a result of the Project. The Applicants will use the FAA Notice Criteria Tool to analyze potential impacts from the Project on airspace for structure locations and heights once a route is selected by the MPUC. No impacts to the Ortonville Municipal Airport or other FAA-registered commercial or private aviation facilities are expected based on a preliminary analysis. The Applicants will obtain FAA Determinations of No Hazard (Form 7460-1, Notices of Proposed Construction or Alteration) prior to

construction of the structures, as needed. The Applicants will also comply with applicable requirements for pre- and post-construction FAA submittals (Form 7460-2).

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 counties crossed by the Route Options.

Construction and operation of the Project is not expected to impact heliports operating from hospitals in Alexandria and Ortonville. The Applicants will coordinate with the FAA and MnDOT to address any Project-related concerns for aviation activities as the Project progresses, if necessary.

7.3 Land-Based Economies

Construction and operation of the Project have the potential to affect land-based economies in Big Stone, Swift, Stevens, Pope, and Douglas counties through the introduction of long-term infrastructure that 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 vicinity of the Route Options and discusses how the Project may affect these economies, as well as mitigation measures that the Applicants will implement.

7.3.1 Agriculture

As described in **Section 7.1**, the predominant land cover type crossed by the Project is cultivated cropland, including crops such as corn for grain and silage, soybeans, hay/haylage, dry beans, and oats or rye for grain. According to the USDA's 2022 Census of Agriculture, the average farm size in the counties crossed by the Project is 513 acres (Table 7.3-1). The total crop sales for the counties crossed by the Project account for a larger percentage of the total agricultural product market value compared to livestock sales except for Stevens County. Agricultural statistics for the counties crossed by the Project are summarized in Table 7.3-1.

Table 7.3-1 2022 Agricultural Statistics of Counties Crossed by the Route Options

State / County	Number of Farms	Average Farm Size (acres)	Total Land in Farm Operation (acres)	Crop Sales	Livestock, Poultry and Products Sales
Minnesota	**65,531**	**388**	**25.4 million**	**$17.1 billion (60%)**	**$11.3 billion (40%)**
Big Stone	392	673	263,888	$158.7 million (81%)	$36.2 million (19%)
Swift	708	530	374,933	$278.2 million (61%)	$175.1 million (39%)

State / County	Number of Farms	Average Farm Size (acres)	Total Land in Farm Operation (acres)	Crop Sales	Livestock, Poultry and Products Sales
Stevens	500	662	330,936	$256.4 million (44%)	$327.3 million (56%)
Pope	821	378	310,041	$176.4 million (72%)	$68.4 million (28%)
Douglas	980	274	268,096	$133.3 million (79%)	$35.3 million (21%)
			Total Sales	**$1.0 billion**	**$642.3 million**

Source: USDA 2022

Prime Farmland, Prime Farmland if Drained, and Farmland of Statewide Importance are described in **Section 7.4.9**.

The Conservation Reserve Enhancement Program (CREP) is part of the CRP, which is a land conservation program established by the USDA and administered by the Farm Service Agency (FSA) that pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production in an effort to improve environmental health and quality (USDA Undated). Minnesota implemented the CREP to target state-identified, high-priority conservation issues by offering payments to farmers and agricultural landowners to retire environmentally sensitive land using the Reinvest in Minnesota (RIM) Reserve Program (BWSR 2019). Enrollment in the CRP and CREP is voluntary. No agricultural areas along the Route Options are part of CREP.

In their October 18, 2024, correspondence, Minnesota BWSR identified nine RIM easements within the Route Width of the Route Options totaling 95.2 acres. Of the 95.2 acres, approximately 3.8 acres fall within the ROW of Route Option South 1 and 0.1 acre fall within the ROW of Route Option South 2[14].

These easements are shown in **Appendix D-4**.

7.3.1.1 Impacts and Mitigation

Temporary construction impacts on agricultural land could include soil compaction and rutting, soil erosion, crop disturbance, disruption to normal farming activities, and introduction of noxious weeds. Construction will occur throughout the year, with many structures being constructed outside of growing and harvest seasons. However, some lands will not be available for agricultural production during the growing season. During winter, impacts are not anticipated to affect agricultural activities as crop fields are unplanted.

[14] Addends may not sum due to rounding.

The Applicants will implement measures to reduce compaction, soil erosion, and sedimentation and will compensate landowners for crop damage. The Applicants have developed a draft AIMP that was reviewed by the Minnesota Department of Agriculture (MDA) in October 2024, to identify measures they will take to avoid, mitigate, minimize, repair, and/or provide compensation for impacts on agricultural land. The AIMP and its provisions will be implemented during construction and restoration activities that the Applicants undertake for the Project prior to filing notice of completion of construction. Landowners will be compensated for crops damaged during the construction process and future year crop loss due to soil compaction. Construction, restoration, and maintenance activities will follow a USDA-approved AIMP. A draft AIMP is included in **Appendix K** and a draft VMP is included in **Appendix J**.

Both crop and livestock activities will be able to continue around Project facilities after construction. While anticipated alignments were developed with attention to minimizing farmland impacts, permanent impacts to farmland will occur where structures are placed in cultivated fields. Similarly, if the Regeneration Station is located on farmland, it will result in permanent impacts for the estimated 100-feet-wide by 100-feet-long (0.23 acre) footprint. Structures in fields act as obstructions and can hinder efficient operation of large machinery. Both crop and livestock activities will be able to continue around Project facilities after construction, but at an increased difficulty to the farmer.

7.3.2 Forestry

As discussed in **Section 7.1**, few forested areas exist within the Route Options. No commercial forest operations have been identified within the Project Study Area. According to the MDNR forest inventory, a total of approximately 73.4 acres of State managed forested land is crossed by the Route Width of the Route Options as shown in Table 7.3-2 below (MDNR 2024i).

Table 7.3-2 Managed Forested Land Crossed by the Route Options

Route Option	Managed Forested Land within the Route Width (acres)
Route Option South 1	0
Route Option South 2	0
Segment Alternative S18	0
Connector Segment S16	0
Connector Segment S17	0
Route Option Central 1	30.7
Route Option Central 2	0
Connector Segment C11	0

Route Option	Managed Forested Land within the Route Width (acres)
Route Option North 1	37.0
Route Option North 2	5.7
Segment Alternative N9	0
Segment Alternative N10	0
Segment Alternative N11	0
Total	**73.4**

Source: MDNR 2024i

7.3.2.1 Impacts and Mitigation

Since there are no known commercial forestry operations in the vicinity of the Route Options (MDNR 2024i), there are no anticipated impacts to commercial forestry operations from the construction and operation of the Project. Impacts on wooded lands have been reduced by prudent routing which minimizes the tree clearing to the extent feasible. As a result, no mitigative measures are proposed.

Impacts on forest resources will occur at locations where trees need to be cleared within the ROW. For potential impacts to vegetation, *see* **Section 7.4.10**.

7.3.3 Tourism

Tourism in the Project Study Area centers on outdoor recreational activities described in **Section 7.2.10**, such as fishing, hunting, and wildlife viewing, and the leisure and hospitality industries. Recreation areas, including state and county parks, WPAs, and WMAs, are located within the Project Study Area. Minnesota state residents and nonresidents spent $12.1 billion on wildlife-associated recreation in Minnesota during 2022 (MDNR 2022a). Anglers spent $5.9 billion, hunters spent $1.2 billion, and wildlife watchers spent $5 billion (MDNR 2022).

The leisure and hospitality industries consist of accommodations; food services and drinking places; and arts, entertainment and recreation. In 2022, gross sales in the leisure and hospitality industries were highest in Douglas County out of the counties crossed by the Route Options (*see* Table 7.3-3).

Table 7.3-3 Leisure and Hospitality Tourism by County Crossed by the Route Options in 2022

County	Gross Sales	State Sales Tax	Employment (number of employees)
Big Stone	$6,982,489	$503,104	11
Swift	$10,398,535	$724,601	220
Stevens	$16,527,807	$1,138,776	381
Pope	$19,578,754	$1,335,465	338
Douglas	$120,708,879	$7,988,365	2,162

Source: Explore Minnesota 2022

7.3.3.1 Impacts and Mitigation

Construction of the Project is not anticipated to affect available tourism opportunities. Impacts to tourism will be similar to those related to recreation noted in **Section 7.2.10** and will be related mostly to Project construction, which will be temporary and confined to specific areas. To the extent practicable, the Applicants will plan the construction timeline for winter, to avoid the higher volume seasons on public recreational lands.

7.3.4 Mining

Mining does not comprise a major industry in the Project Study Area. Big Stone County is the only county crossed by the Project that has industrial mining operations (MDNR 2016). Granite and crushed stone mines are located along the Minnesota River corridor in Big Stone County (MDNR 2016). The crushed stone is primarily used for making concrete for highways, roads, bridges, and buildings. Active gravel pits occur in all 87 counties in the state but are not mapped by MDNR due to their smaller scale and gaps in data for some counties (MDNR 2016).

Minnesota Department of Revenue collected $115,827 in aggregate material production tax from Big Stone County in 2023; no data were available for the other counties in the Project Study Area (MDR 2024). Aggregate material includes sand, gravel, crushed rock, limestone, and granite, among others.

A query of aggregate sources from the MnDOT Gravel Pit and Rock Quarry Aggregate Source Map (MnDOT 2024c) was conducted within the Project Study Area and was manually confirmed and revised through review of satellite imagery. A summary of aggregate pits and quarry operations along the Route Options and ROWs is provided in Table 7.3-4 below.

Mining and quarry operations were only identified to occur within Route Option South 1, Route Option South 2, Route Option North 2, and Segment Alternative N11.

Table 7.3-4 Aggregate Pits and Quarry Operations Within the Route Options and ROW

Route Option	Aggregate Pits and Quarry Operations Within the Route Width	Aggregate Pits and Quarry Operations Within the ROW
Route Option South 1	19	17
Route Option South 2	17	17
Segment Alternative S18	0	0
Connector Segment S16	0	0
Connector Segment S17	0	0
Route Option Central 1	0	0
Route Option Central 2	0	0
Connector Segment C11	0	0
Route Option North 1	0	0
Route Option North 2	12	10
Segment Alternative N9	0	0
Segment Alternative N10	0	0
Segment Alternative N11	5	4

7.3.4.1 Impacts and Mitigation

Impacts to mining from the Project will be short-term from construction and permanent from Project operations. Construction-related access could interfere with mining operations. However, these impacts will be minor and mitigated through advanced notice and planning. Permanent impacts from the placement of transmission line structures or the Regeneration Station near mining operations are expected to be minimal but could interfere with access to existing mines and could limit the future expansion of the mining operation depending on the route option selected. The Applicants will coordinate with landowners to determine the optimal placement of structures to minimize the permanent impacts to mining operations.

Construction of the Project will require the use of sand and aggregate for structure backfill and to construct reliable access routes for construction equipment. Depending on availability, some of the sand and aggregate material could come from sources near the Project. Increased demand for sand and aggregate material as a result of the Project will be temporary and limited to the period of construction. Additional new mining operations or expansion of existing mines are not expected to be necessary to satisfy Project demand.

7.4 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.

7.4.1 Air Quality and Greenhouse Gases

7.4.1.1 Criteria Pollutants

Section 109(b) of the Clean Air Act (CAA) requires that the USEPA establish National Ambient Air Quality Standards (NAAQS) "requisite to protect" public health and welfare (42 United States Code [USC] 7401 et seq.; 40 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.

The USEPA has promulgated NAAQS for six criteria pollutants: ozone, particulate matter (PM10/PM2.5), sulfur dioxide (SO2), nitrogen dioxide, carbon monoxide (CO), and lead. Individual states implement the CAA through State Implementation Plans. The USEPA and state agencies operate a system of air quality monitoring stations throughout the country. Readings from these stations are compared to the NAAQS as a way to classify the air quality of the area surrounding the monitoring stations. Areas of the country that do not meet the NAAQS are classified as "non-attainment" areas. Regions that were classified as non-attainment and have improved their air quality to meet the NAAQS are considered to be in "maintenance." Areas of the country that are not represented by a monitoring station are considered "unclassifiable." Unclassifiable areas are considered to be in attainment with the NAAQS.

Compliance with the national and state air quality standards in the State of Minnesota is assessed at the county level. The USEPA designates all of the counties within the Route Options to be in attainment for all NAAQS (USEPA 2024a).

7.4.1.2 Emissions Related to Construction

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 ROW clearing and construction, combustion emissions from construction machinery engines, helicopter emissions, and indirect emissions attributable to construction workers commuting to and from work sites and other material hauling 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 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. It is assumed that the contractor will achieve at least 50 percent PM10 control efficiency through a variety of fugitive dust control measures.

Table 7.4-1 summarizes the estimated potential emissions of criteria pollutants from construction activities for the Project, including transmission line work (*see* **Section 7.4.2** below for information on greenhouse gas (GHGs) emissions associated with the Project). Construction emissions are calculated based on typical counts of diesel-fueled construction equipment, expected hours of operation, helicopter use, and estimated vehicle miles traveled. Fugitive dust emissions assume an area of disturbance for a 110-mile-route length and a 150-foot-ROW width. Supporting emission calculations are provided in **Appendix M**.

Table 7.4-1 Construction Emissions of Criteria Air Pollutants (tons/year)

Construction Components	NO_x[1]	CO	VOC[2]	PM_{10}	$PM_{2.5}$
Year 2028					
Off-Road Engine Emissions	49.84	29.02	2.62	1.68	1.68
Fugitive Dust Emissions	0.00	0.00	0.00	381.18	38.62
On Road Emissions	0.64	5.13	0.05	0.78	0.20
Helicopter Emissions	0.88	1.92	1.60	0.03	0.03
Year 2028 Total	51.35	36.07	4.27	383.67	40.53
Year 2029					
Off-Road Engine Emissions	51.36	29.91	2.70	1.73	1.73
Fugitive Dust Emissions	0.00	0.00	0.00	381.18	38.62
On Road Emissions	0.53	4.80	0.04	0.78	0.20
Helicopter Emissions	1.97	4.33	3.61	0.06	0.06
Year 2029 Total	53.86	39.04	6.35	383.75	40.62
Year 2030					
Off-Road Engine Emissions	51.36	29.91	2.70	1.73	1.73
Fugitive Dust Emissions	0.00	0.00	0.00	381.18	38.62
On Road Emissions	0.47	4.59	0.04	0.78	0.20

Construction Components	NO_x[1]	CO	VOC[2]	PM_{10}	$PM_{2.5}$
Helicopter Emissions	1.97	4.33	3.61	0.06	0.06
Year 2030 Total	53.80	38.83	6.34	383.75	40.62
Year 2031					
Off-Road Engine Emissions	10.92	6.36	0.57	0.37	0.37
Fugitive Dust Emissions	0.00	0.00	0.00	18.08	1.89
On Road Emissions	0.06	0.68	0.00	0.12	0.03
Helicopter Emissions	0.31	0.67	0.56	0.01	0.01
Year 2031 Total	11.28	7.71	1.14	18.58	2.30

[1] NOx: Nitrogen Oxide
[2] VOC: Volatile Organic Compound

Air emissions 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 results in a violation of NAAQS. At the completion of construction activities, all construction-related air impacts would cease.

7.4.1.3 Emissions Related to Operations

During operation of the transmission line, air emissions would be minimal. Small amounts of NO_X and ozone are created due to corona from the operation of transmission lines. 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 high voltage transmission lines is not detectable during fair weather above ambient conditions. Ozone production under wet-weather conditions is detectable with special efforts but will result in emissions below the NAAQS and, therefore, is considered insignificant.

A small amount of ozone is created due to corona from the operation of transmission lines. A corona signifies a loss of electricity, so the Applicants have engineered the transmission lines to limit corona. During operation, corona effects will be minimized by using good engineering practices, such as using bundled conductors.

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. Conversely, 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.

The Regeneration Station's backup power generator will operate intermittently (only during power outages). Since emissions from operation and routine

maintenance/testing of the Regeneration Station will only be from propane and vehicle use, the resulting emissions are expected to be nominal and therefore were not included in the analysis for emissions related to Project operations.

7.4.1.4 Impacts and Mitigation

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 ROW clearing and construction, combustion emissions from engines in construction machinery, 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 as discussed in **Section 7.4.1.3**. Given the small impact during operation of the line, no mitigation measures are proposed.

7.4.2 Greenhouse Gas Emissions and Climate Change

7.4.2.1 Greenhouse Gas Emissions

Some of the most abundant gases in the atmosphere are known as GHGs. The most common GHGs include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), 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 the Earth's atmosphere by absorbing light energy and emitting a portion of released energy back

towards Earth (USEPA 2024b). 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 (USEPA 2024c).

The amount of energy absorbed by one 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 CO2, CH4, N2O, and fluorinated gases (USEPA 2024b). For ease of comparison, GWPs are calculated relative to the energy absorption of one ton of CO2. Emission of a given GHG is normalized using the GWP; the resultant value is referred to as carbon dioxide equivalent (CO2e).

During construction and operation of the Project, GHG emissions will be generated. GHG emissions from the Project will be largely from the combustion of fossil fuels such as gasoline and diesel. GHGs associated with fuel combustion are CO2, CH4, and N2O. The largest source of GHG emissions from the Project will be from the temporary combustion of fossil fuels in construction equipment and heavy machinery and additional GHG emissions from helicopter and vehicle use. Total GHG emissions from the construction of the Project are estimated to be approximately 22,756 metric tons of CO2e. Table 7.4-2 provides a preliminary estimate of CO2, CH4, and N2O emissions. CO2 and CH4 emissions were calculated using factors for diesel combustion from the South Coast Air Quality Management District (SCAQMD) (SCAQMD 2024). N2O emissions were estimated using The Climate Registry emission factor for construction/mining equipment (The Climate Registry 2023). Detailed calculations are in **Appendix M**.

Table 7.4-2 Greenhouse Gas Emissions From Project Construction

Emission Source	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e (metric tons)
Year 2028				
Off-Road Engine	5126.21	0.09	0.47	5253.84
On-Road	947.80	0.01	0.04	958.41
Helicopter	428.59	0.02	0.00	430.03
Year 2029				
Off-Road Engine	5283.68	0.09	0.49	5415.22
On-Road	938.15	0.01	0.04	948.73
Helicopter	964.32	0.04	0.01	967.57
Year 2030				
Off-Road Engine	5283.68	0.09	0.49	5415.22
On-Road	931.24	0.01	0.04	941.83
Helicopter	964.32	0.04	0.01	967.57

Emission Source	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e (metric tons)
Year 2031				
Off-Road Engine	1123.89	0.02	0.10	1151.88
On-Road	143.99	0.00	0.01	145.62
Helicopter	150.01	0.01	0.00	150.51
Total (metric tons)	**22,285.88**	**0.44**	**1.69**	**22,746.41**
Total (short tons)	**24,565.98**	**0.49**	**1.86**	**25,073.63**

Most of the GHGs generated from the Project will cease after construction is complete. Emissions resulting from routine operation and maintenance of the transmission line will largely be from the combustion of diesel in maintenance equipment. There would be no on-road emissions as those would be accounted for separately by the Applicants. Total annual GHG emissions expected from the routine operation and maintenance of the Project are estimated to be approximately 17 metric tons of CO2e per year. Since GHG emissions generated from operation and routine maintenance/testing of the Regeneration Station will only be from propane and vehicle use, the resulting emissions are expected to be nominal and therefore were not included in this analysis.[15]

Table 7.4-3 provides a preliminary estimate of CO2, CH4, and N2O emissions. Emissions were calculated using factors from SCAQMD and the USEPA CCCL (SCAQMD 2024). Detailed calculations are in **Appendix M**.

Table 7.4-3 Annual Greenhouse Gas Emissions From Project Operations

Emission Source	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	CO_2e (metric tons)
Off-Road Engine	16.75	<0.01	<0.01	17.18

7.4.2.2 Climate Change

Climate change is the alteration of average or "typical" weather, which includes variables like temperature, precipitation, and drought, in a certain location. Anthropogenic climate change is caused by the production of GHGs, gases that exacerbate climate change through increased infrared radiation absorption in the atmosphere. The concentration of GHGs in the atmosphere has a direct relationship to global warming or climate change. Although the warmest months of the year in Minnesota (June-

[15] The Regeneration Station's backup power may be a battery bank or a propane generator that will operate intermittently for monthly maintenance and during power outages.

September) have demonstrated a decreasing trend in average high temperatures, the overall annual trend is increasing, indicating greater annual temperature increases in some months to account for the negative trend observed within the summer months (MDNR 2024s).

The MDNR's Minnesota Climate Explorer tool provides a summary of projected climate conditions for the state of Minnesota. For the counties crossed by the Project (Big Stone, Swift, Stevens, Pope, Douglas), average air temperature is anticipated to increase by approximately 4 degrees Fahrenheit (°F) by the mid-21st century and maximum air temperature is anticipated to increase by 3°F under mean model warming scenarios. Both average temperature and maximum temperature are anticipated to increase by 6°F by the end of the 21st century under mean model warming scenarios. Minimum air temperatures are projected to increase by approximately 4°F by mid-century and 8°F for end of century under mean model warming scenarios (MDNR 2024j). Total precipitation is not anticipated to noticeably increase or decrease by mid-century or the end of the 21st century under mean model warming scenarios (MDNR 2024j).

Based on the available data within the counties crossed by the Project, average temperatures, maximum temperatures, and minimum temperatures have increased or are projected to increase by the end of the century, all of which can be explained or supported by the concept of climate change. With increased GHG emissions from anthropogenic actions such as the burning of fossil fuels for transportation and power generation, the GHG effect's positive feedback loop continues to be fueled. Implications of this feedback loop include rising temperatures and are a very reasonable explanation for the trends observed in the four analyzed climate variables.

7.4.2.3 Impacts and Mitigation

The Project will be routed and engineered to be resilient under changing climatic factors including increased average temperatures.

The GHG emissions generated during construction and routine operation or maintenance activities will be minimal and have little impact on climate change or the project.

High temperatures can affect the sagging of a transmission line conductor and its thermal tolerance. However, the transmission lines would be built to meet or exceed local, state, and NESC standards consistent with the Applicants' criteria for ambient weather conditions. Changes in storm timing and intensities may increase landslide potential in areas of steeper terrain and increase the risk of local flooding. The Applicants will design the top of the concrete for the structure foundations to be one foot above the 100-year

floodplain elevation anywhere structures are installed in areas prone to flooding. If flooding were to exceed the 100-year flood level, the structures and foundations will have the resilience to resist the flood loads. Final structure placement will consider the Project ROW slope to avoid areas with steeper terrain and associated risks of erosion and landslides. Geotechnical studies will also be performed, which will indicate water table levels during drilling. With regards to areas with fluctuating water tables and near flood plains, Applicants will design the foundation assuming that the water table is at the ground surface. This methodology provides a conservative approach to changing environmental conditions. Upon construction completion, the disturbed area will be restored and revegetated.

Due to increases in annual temperatures, there may be periods of dry weather and concerns of wildfires caused by increases in drought severity. However, the transmission line facilities would be maintained to meet or exceed NERC reliability standards and NESC requirements that address vegetation management, including the increase of noxious weeds that could occur from changed climate conditions that allow them to spread.

Surface water temperatures could increase in locations where the Project requires tree clearing along shorelines, increasing sun exposure. Tree clearing along shorelines will be minimal and associated changes to water temperatures are not anticipated.

The effects of climate change include increased precipitation and flooding events, particularly around floodplains adjacent to rivers or streams. As discussed in **Section 7.4.4**, the Route Options and Route ROW are within portions of the Federal Emergency Management Administration (FEMA) 100-year floodplains, which puts the transmission lines at an increased risk of being impacted by flooding induced by climate change. To reduce the potential impacts of climate change, the Project will be designed beyond the minimum NESC criteria in order to withstand extreme weather events, including flooding, extreme winds, and extreme ice conditions, to ensure electric reliability is maintained regardless of which Route Options are ultimately selected for the Project.

7.4.3 Watersheds

The Project is located within the Mississippi River Headwaters Basin and Minnesota River Basin and crosses four watersheds, though crossings vary depending on Route Option. Table 7.4-4 lists the watersheds crossed by each Segment denoted by the 8-digit Hydrologic Unit Code (HUC) assigned by the USGS. Major rivers crossed by the Route Options include the Chippewa River, Little Chippewa River, Minnesota River,

Pomme de Terre River, and Stony Run River (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3**).

Table 7.4-4 Watersheds (HUC-8) Crossed by the ROW

Route Option	Watershed Name (USGS HUC-8) and Crossing Length (miles)			
	Long Prairie	Chippewa	Pomme De Terre	Upper Minnesota
	(07010108)	(07020005)	(07020002)	(07020001)
South 1	N/A	8.5	8.2	25.2
South 2	N/A	N/A	19.2	19.6
Connector Segment S16	N/A	N/A	N/A	0.5
Connector Segment S17	N/A	N/A	N/A	0.5
Segment Alternative S18	N/A	N/A	N/A	2.4
Central 1	N/A	32.0	2.4	N/A
Central 2	N/A	38.2	0.4	N/A
Connector Segment C11	N/A	1.5	N/A	N/A
North 1	7.1	11.0	N/A	N/A
North 2	7.5	17.8	N/A	N/A
Segment Alternative N9	N/A	3.0	N/A	N/A
Segment Alternative N10	2.1	N/A	N/A	N/A
Segment Alternative N11	2.0	0.1	N/A	N/A

7.4.3.1 Impacts and Mitigation

The length of streams and rivers crossed by a Route Option does not necessarily correlate to a greater impact on that watershed. Potential impacts on watersheds are tied to the potential impacts of all other water resources and mitigation measures described in **Sections 7.4.3** to **7.4.8**.

7.4.4 Floodplains

A floodplain is a low-lying, flat area adjacent to a river or stream that is prone to flooding. A floodplain contains two parts: the floodway, which is the channel of the stream plus any adjacent areas that will allow floodwaters to pass without increasing the water surface elevation by more than one foot, and the flood fringe, which is essentially the remainder of the floodplain extending out to the elevation that contains the remaining standing water during a flood event. The FEMA maintains the national flood insurance program, which provides flood insurance and reduces flood damages by restricting floodplain development (FEMA 2023). The national flood insurance program database contains flood maps, which show how likely any given floodplain is to flood. These maps consist of the 100-year floodplain, which has a one percent chance of flooding each year, and the 500-year floodplain, which has a 0.2 percent chance of flooding each year. FEMA

100-year and 500-year floodplains are classified as different flood zones and may not always overlap.

In Minnesota, floodplains are typically regulated at the county and city level with enforcement largely depending on local ordinances. The MDNR is required to review and approve all new and amended floodplain ordinances prior to their adoption to verify that minimum state and federal standards are met as defined under Minn. Stat. § 103A.207 and Minn. R. 6120.5700. MDNR also provides regulatory assistance to minimize risk to landowners from potential flood hazards. Construction and operation of utility transmission lines is allowed as a conditional use for floodplain districts. Portions of the Project are located within FEMA-designated 100-year areas. FEMA-designated 100-year floodplain areas are associated with major rivers along the Route Options such as the Minnesota River. No portion of the Project is located within a FEMA-designated 500-year floodplain. Table 7.4-5 provides the total acres of the Route Options and ROWs located within FEMA-designated floodplains based on publicly available county floodplain maps using the MDNR Lake and Flood Elevations Online viewer (MDNR 2022b). Stevens and Pope counties currently only have preliminary versions of FEMA Digital Flood Rate Insurance Maps. Data was digitized from publicly available FEMA floodplain data accessed through the National Flood Hazard Layer.

Table 7.4-5 FEMA Designated 100-Year Floodplains Crossed by the Route Options

Route Option	FEMA Floodplain within Route Width (acres)	FEMA Floodplain within ROW (acres)
	100-Year Floodplain (Zone A and AE)	100-Year Floodplain (Zone A and AE)
Route Option South 1	259.9	24.1
Route Option South 2	206.9	27.4
Connector Segment S16	0	0
Connector Segment S17	0	0
Segment Alternative S18	0	0
Route Option Central 1	0	0
Route Option Central 2	0	0
Connector Segment C11	0	0
Route Option North 1	0	0
Route Option North 2	0	0
Segment Alternative N9	0	0
Segment Alternative N9	0	0
Segment Alternative N9	0	0

Source: FEMA 2023, MDNR 2022b

7.4.4.1 Impacts and Mitigation

The Project may require placement of transmission line structures within FEMA designated 100-year floodplains. No portion of the Project is located within a FEMA-designated 500-year floodplain. Transmission lines will span floodway and flood fringe areas where possible and where structures cannot span floodplains, impacts to floodways or flood fringes would be minimal. The potential placement of transmission line structures in floodplains is not anticipated to alter the flood storage capacity of the floodplain due to the small footprint of the individual transmission line structures.

Contractors will use BMPs including silt fences, inlet protection, and temporary stabilization as applicable during construction to ensure there is minimal damage to floodplains. The Applicants will work with local governments during development in floodplains, as required, and will follow all applicable local ordinances throughout Project construction and operation.

7.4.5 Lakes, Rivers, Streams, and Ditches

Major rivers crossed by the Route Options include the Chippewa River, Little Chippewa River, Minnesota River, Pomme de Terre River, and Stony Run River (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3**). The Project Study Area also contains over 1,000 lakes, 122 of which are greater than 160 acres (an NRCS National Resource Inventory primary sample unit size [USDA 2020]). Some of the larger named lakes within 2.0 miles from the Route Width of the Route Options include Big Stone Lake, Artichoke Lake, Lake Minnewaska, Lake Reno, Maple Lake, Lake Mary, Andrew Lake and Mud Lake. Many of the smaller lakes that are crossed by various Route Options are designated as "shallow lakes," which by Minnesota Statute is defined as, "a body of water, excluding a stream, that is greater than or equal to 50 acres in size and less than or equal to 15 feet in maximum depth" (Minn. Stat. §103G.005, subd. 15e).

Section 404 of the Clean Water Act (CWA) establishes a program to regulate the discharge of dredged or fill material into "Waters of the United States," which encompass all waterways and waterbodies that are permanent and navigable or are relatively permanent bodies of water connected to traditional interstate navigable waters. Navigable waters are designated by the USACE and regulated under Section 10 of the Rivers and Harbors Act of 1899. Under the CWA, no dredged or fill material may be permitted in Waters of the United States if the nation's waters would be significantly degraded or a practicable alternative exists that is less damaging to the aquatic

environment. It is anticipated that the Project Study Area contains surface waters that are considered Waters of the United States.

In Minnesota, additional state MDNR regulations may apply to lakes, rivers, streams, and ditches designated as Public Water Inventory (PWI) waters, which are basins (lakes), watercourses (streams and rivers), and wetlands that meet the criteria set forth in Minn. Stat. §103G.005, subd. 15. Water basins are waterbodies that are enclosed natural depressions with definable banks, capable of containing water, that may be partly filled with waters of the state and is discernible on aerial photographs (Minn. Stat. §103G.005, subd. 16). Projects that have the potential to alter the course, current, or cross section of a PWI basin, watercourse, or wetland require an MDNR Public Waters Work Permit (Minn. Stat. §103G.245).

The Applicants reviewed available state and federal data and applicable regulations to determine the presence of lakes, rivers, streams, and ditches within the Route Options. The findings are summarized in Table 7.4-6, and Table 7.4-7. Note that crossings, including stream and river and PWI waterbody crossings, were limited to the Application Alignments, the ROW, or those fully crossing the Route Options. Waterbodies that flow parallel to the Application Alignments within the Route Options were not considered crossings unless the Application Alignments or ROW were crossed. However, potential impacts to these waterbodies will be analyzed and included in development of the Project SWPPP and NPDES permitting. Datasets and regulations reviewed for populating the table include:

- U.S. Geological Survey National Hydrography Dataset (USGS 2023).
- MDNR PWI Basin and Watercourse Delineations (MNGC 2024d).
- Shallow Lakes Identified by MDNR Wildlife (MNGC 2024e).
- Designated Outstanding Resource Value Waters (ORVW).[16]
- USACE Section 10 Navigable Waters of the United States in Minnesota (MNGC 2024f).

[16] Minn. R. Ch. 7050. Minn. R. 7050.0335

Table 7.4-6 Number of Water Resources Crossed by the Route Options

Route Option	Waterbody Feature				
	No. of Stream and River Crossings	No. of Lake Crossings	No. of PWI Stream and River Crossings	No. of PWI Basins	No. of Shallow Lakes*
Route Option South 1	32	27	6	7	0
Route Option South 2	38	30	9	5	3
Connector Segment S16	3	10	0	0	0
Connector Segment S17	1	0	0	0	0
Route Option Central 1	21	4	6	3	1
Route Option Central 2	49	12	5	2	1
Connector Segment C11	2	1	0	1	0
Route Option North 1	24	4	1	6	5
Route Option North 2	4	22	1	3	0

Note: Some waterbodies may be crossed in two or more locations, which are considered separate crossings.
*A "Shallow Lake" is defined as "a body of water, excluding streams, that is greater than or equal to 50 acres in size and less than or equal to 15 feet maximum depth" (Minn. Stat. § 103G.005, subd. 15e).

Table 7.4-7 Number of Water Resources Crossed by the ROW

Route Option	Waterbody Feature				
	No. of Stream and River Crossings	No. of Lake Crossings	No. of PWI Stream and River Crossings	No. of PWI Basins	No. of Shallow Lakes*
Route Option South 1	27	9	6	5	0
Route Option South 2	25	10	8	5	3
Connector Segment S16	0	4	0	0	0
Connector Segment S17	0	0	0	0	0
Route Option Central 1	15	2	5	0	0
Route Option Central 2	30	5	5	0	0
Connector Segment C11	1	0	0	1	0
Route Option North 1	15	3	1	4	2
Route Option North 2	3	8	1	3	0

Note: Some waterbodies may be crossed in two or more locations, which are considered separate crossings.
*A "Shallow Lake" is defined as "a body of water, excluding streams, that is greater than or equal to 50 acres in size and less than or equal to 15 feet maximum depth" (MN Statues 103G.005, subd. 15e).

7.4.5.1 South Segment

7.4.5.1.1 Route Option South 1

According to the USGS National Hydrography Dataset (USGS 2023), 32 streams or rivers and 27 lakes will be crossed by Route Option South 1. Of those, six streams or rivers and seven basins (lakes) are listed as PWI waters. None of the lakes are designated as shallow lakes. PWI waters crossed by Route Option South 1 include the Minnesota River, Stony Run, and Pomme de Terre River.

Within the ROW, Route Option South 1 crosses 27 streams or rivers and nine lakes, which include six streams or rivers and five lakes that are designated as PWI waters.

None of the lakes are shallow lakes. Three of the rivers crossed by the ROW (Minnesota River, Pomme de Terre, and Stony Run) are PWI waters.

7.4.5.1.2 Route Option South 2

The USGS National Hydrography Dataset (USGS 2023) shows Route Option South 2 to cross 38 streams or rivers and 27 lakes. Of these, nine streams or rivers and five lakes are PWI waters. Three of the lakes are shallow lakes. Similar to Route Option South 1, three of the rivers crossed include the Minnesota River, Stony Run, and Pomme de Terre River.

Within the ROW, 25 streams or rivers and ten lakes are crossed by Route Option South 2. Eight streams and rivers and five lakes are considered PWI waters, and three lakes are shallow lakes. Three of the rivers crossed by the ROW (Minnesota River, Pomme de Terre, and Stony Run) are PWI waters.

7.4.5.1.3 Connector Segment S16

Connector Segment S16 has three stream and river crossings and ten lake crossings within the Route Width. None of the streams or lakes are listed as PWI waters, and none of the lakes are shallow lakes.

Of the ten lakes crossed by the Connector Segment S16 Route Width, four lakes are also crossed by the ROW. The ROW avoids crossing any streams or rivers, including PWI streams and rivers, as well as PWI basins and/or shallow lakes.

7.4.5.1.4 Connector Segment S17

Connector Segment S17 has one stream or river crossing and no lake crossings (including PWI streams or basins) within the Route Width. No waterbodies of any kind are crossed by the ROW.

7.4.5.2 Central Segment

7.4.5.2.1 Route Option Central 1

According to the USGS National Hydrography Dataset (USGS 2023), 21 streams or rivers and four lakes will be crossed by Route Option Central 1. Of those, six streams or rivers and three basins are listed as PWI waters. One of the lakes is designated as a shallow lake. The PWI waters crossed by Route Option Central 1 include the Chippewa and Little Chippewa rivers.

Within the ROW, Route Option Central 1 crosses 15 streams or rivers and two lakes, which include five streams or rivers that are designated as PWI waters. The ROW

does not cross any PWI-designated basins or shallow lakes. Two of the rivers crossed by the ROW (Chippewa and Little Chippewa rivers) are PWI waters.

7.4.5.2.2 Route Option Central 2

The USGS National Hydrography Dataset (USGS 2023) shows Route Option Central 2 to cross 49 streams or rivers and 12 lakes. Of these, five streams or rivers and two lakes are PWI waters. One lake is a shallow lake. Similar to Route Option Central 1, two of the rivers crossed include the Chippewa and Little Chippewa rivers. The Little Chippewa River is crossed in two locations.

Within the ROW, 30 streams or rivers and five lakes will be crossed for Route Option Central 2. Five streams and rivers are considered PWI waters; none of the lakes crossed by Route Option Central 2 ROW are listed as PWI waters and none of the lakes are shallow lakes. The Route Option Central 2 ROW will also cross two major rivers including the Chippewa and Little Chippewa rivers with the Little Chippewa River being crossed in two locations.

7.4.5.2.3 Connector Segment C11

Connector Segment C11 crosses two stream and rivers and one lake within the Route Width. The lake is considered a PWI basin but is not a shallow lake.

One of the streams or rivers crossed by the Connector Segment C11 Route Width will also be crossed by the Connector Segment C11 ROW. The ROW avoids crossing any PWI streams and rivers or shallow lakes.

7.4.5.3 North Segment

7.4.5.3.1 Route Option North 1

According to the USGS National Hydrography Dataset (USGS 2023), 24 streams or rivers and four lakes will be crossed by Route Option North 1. Of those, one stream or river and six lakes are listed as PWI waters. Five of the lakes are designated as shallow lakes. Named PWI waters crossed by Route Option North 1 include the Little Chippewa River and Mud Lake.

Within the ROW, Route Option North 1 crosses 15 streams or rivers and three lakes, which includes one stream or river and four lakes designated as PWI waters. Two of the lakes are shallow lakes. Named PWI waters crossed by the Route Option North 1 ROW include the Little Chippewa River and Mud Lake.

7.4.5.3.2 Route Option North 2

The USGS National Hydrography Dataset (USGS 2023) shows Route Option North 2 to cross four streams or rivers and 22 lakes. Of these, one stream or river and three lakes are PWI waters. None of the lakes are shallow lakes. The only named water feature crossed by Route Option North 2 is Outlet Creek.

Within the ROW, three streams or rivers and eight lakes will be crossed for Route Option North 2. One stream and river and three lakes are considered PWI waters. None of the lakes are shallow lakes. Outlet Creek is the only named feature crossed by the ROW.

7.4.5.4 Impacts and Mitigation

The Project will have minor, mostly short-term, effects on surface water resources. The Applicants will design the Project to avoid or minimize impacts to surface water resources to the extent feasible. Structure foundations will be located outside of all streams. It is anticipated that crossing of streams and drainageways will be avoided by the temporary access roads; if impacts occur, they will be temporary and restored in accordance with applicable requirements. The Applicants will work with the MDNR to ensure proper licenses and approvals are obtained for PWI crossings by the Project. Through the license approval process, the Applicants and MDNR will determine the appropriate mitigation measures for PWI crossings.

Impacts to surface water quality such as sedimentation during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures will be avoided and minimized to the extent possible using appropriate sediment control measures and construction practices. These practices will be detailed in the NPDES permit and SWPPP that will be completed prior to the start of construction. The Applicants will seek coverage under a USACE Section 404 Minnesota Utility Regional General Permit; the MPCA has already issued a Section 401 certification associated with the Utility Regional General Permit. An individual Section 401 certification is not anticipated. Upon completion of the Project, temporarily disturbed areas will be restored to previous condition to the extent practicable. No meaningful impacts to surface waters are expected due to the minimization and mitigation measures implemented.

The Applicants will maintain 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 and VMP.

Watercourses will only be crossed by construction equipment where required to support construction activities. Additionally, the Applicants will obtain crossing permits and consult with the appropriate local, state and/or federal agencies, as necessary. Where watercourses must be crossed to string new conductors and shield wires, workers may walk across, use boats, install matting, or drive equipment across ice in the winter. These practices will help to prevent soil erosion and reduce the likelihood for water quality impacts related to construction activities.

An NPDES permit from the MPCA will be obtained by the Applicants for construction of the Project. The Applicants will also develop a SWPPP that complies with MPCA rules and guidelines. All waterways crossed will be maintained for proper drainage through the use of temporary culverts or other temporary crossing devices, according to BMPs and permit requirements. If tree removal is required along waterways, trees will be cut, leaving the root systems intact to retain bank stability. Sediment barriers, if deemed necessary, will be used along waterways and slopes during construction to protect from soil erosion and sedimentation. Additionally, if new access roads for vehicles and equipment are required, access roads will be selected to avoid disturbances to stream banks and/or stream channels below the OHWL. No permanent impacts to surface water resources are anticipated.

7.4.6 Water Quality

7.4.6.1 Impaired Waters

Under CWA Section 303(d), Minnesota is required to establish basic standards for regulating water quality and develop a list of waters for which current regulations are not stringent enough to meet the state water quality standards, specified as "Impaired Waters," and listed in the MPCA Inventory of Impaired Waters (MPCA 2024b). Impairments to water quality are typically caused by an influx of pollutants due to unsustainable agricultural activities, urban runoff, municipal sources, and hydrologic modifications. Under the CWA, Minnesota must develop Total Maximum Daily Loads for these waters, which includes the maximum concentration of pollutants that can be present in impaired waters and set goals to restore water quality standards. Additionally, under Section 401 of the CWA, the MPCA has the authority to require projects that discharge to jurisdictional waters, to obtain a Water Quality Certification and comply with state and federal water quality regulations.

A NPDES permit is required for projects that could influence surface waters and requires the applicant to design and maintain effect erosion and sediment controls, stabilize disturbed areas, and prohibit or mitigate dewatering discharge, which would

prevent impacts to impaired waters. A NPDES permit is required for construction activity disturbing one acre or more of land or for disturbing land under one acre that is part of a common plan of development or sale. Additionally, construction that could impact impaired waters must develop a SWPPP for construction activities and, where necessary, include BMPs to be used during construction that would be specific to the waterbody, geography and impairment(s).

Table 7.4-8 through Table 7.4-11 summarize waterbodies listed by the MPCA Inventory of Impaired Waters and crossed by the Route Options, including number of crossings and impairments present in the crossed section of the waterbody (MNGC 2024g). See detailed maps for waterbody crossings (*see* **Appendix D-1, Appendix D-2,** and **Appendix D-3**).

7.4.6.1.1 South Segment

Route Options South 1 crosses three impaired waterbodies: Minnesota River, Pomme de Terre River, and Stony Run. In addition to these three rivers, Route Option South 2 also crosses Artichoke Lake, South Drywood Lake, and an unnamed creek which are listed for impairments. Neither Connector Segment S16 nor Connector Segment S17 cross any impaired waterbodies. Table 7.4-8 lists the impaired waterbodies crossed by the South Segment.

Table 7.4-8 Impaired Waterbodies Crossed by the South Segment

Waterbody Name	AUID[1]	Impairment	No. of Crossings in Route Option[2]	No. of Crossings in ROW
Route Option South 1				
Minnesota River	07020001-552	• Benthic macroinvertebrate bioassessment • E. coli • Mercury in fish tissue	1	1
Pomme de Terre River	07020002-501	• Benthic macroinvertebrate bioassessments • Fecal coliform • Fish bioassessments • Mercury in fish tissue • Turbidity	1	1
Stony Run	07020001-531	• Benthic macroinvertebrate bioassessments • E. coli • Fish bioassessments	1	1

Waterbody Name	AUID[1]	Impairment	No. of Crossings in Route Option[2]	No. of Crossings in ROW
Route Option South 2				
Artichoke Lake	06-0002-00	• Mercury in fish tissue	0	0
Minnesota River	07020001-552	• Benthic macroinvertebrate bioassessment • E. coli • Mercury in fish tissue	1	1
Pomme de Terre River	07020002-501	• Benthic macroinvertebrate bioassessments • Fecal coliform • Fish bioassessments • Mercury in fish tissue • Turbidity	1	1
South Drywood Lake	76-0149-00	• Nutrients	1	0
Stony Run	07020001-531	• Benthic macroinvertebrate bioassessments • E. coli • Fish bioassessments	1	1
Unnamed Creek	07020002-566	• Nutrients	1	1
Connector Segment South S16				
None	-	-	-	-
Connector Segment South S17				
None	-	-	-	-

[1]AUID: Assessment Unit Identification Number (MPCA 2024b)
[2]Includes the entire Route Width which is generally 1,000 feet wide (500 feet on either side of the Application Alignment) and encompasses the ROW.

7.4.6.1.2 Central Segment

Route Option Central 1 crosses three impaired waterbodies: Little Chippewa and Chippewa rivers and an unnamed creek. Route Option Central 2 crosses four impaired waterbodies including the Chippewa River, Judicial ditch 9, and two crossings of the Little Chippewa River. Connector Segment C11 does not cross any impaired waterbodies. No impaired lakes are crossed by the Central Segment. Table 7.4-9 lists the impaired waterbodies crossed by the Central Segment.

Table 7.4-9 Impaired Waterbodies Crossed by the Central Segment

Waterbody Name	AUID[1]	Impairment	No. of Crossings in Route Option[2]	No. of Crossings in ROW
Route Option Central 1				
Chippewa River	07020005-503	• Benthic macroinvertebrate bioassessments • Fecal coliform • Fish bioassessments • Mercury in fish tissue • Nutrients • Turbidity	1	1
Little Chippewa River	07020005-713	• Benthic macroinvertebrate bioassessments • E. coli • Fish bioassessments • Turbidity	1	1
Unnamed Creek	07020005-694	• Benthic macroinvertebrate bioassessments	1	1
Route Option Central 2				
Chippewa River	07020005-504	• Mercury in fish tissue • Turbidity	1	1
Judicial Ditch 9	07020005-585	• Fish bioassessments	1	1
Little Chippewa River	07020005-713	• Benthic macroinvertebrate bioassessments • E. coli • Fish bioassessments • Turbidity	1	1
	07020005-714	• Benthic macroinvertebrate bioassessments • Fish bioassessments	1	1
Connector Segment Central C11				
None	-	-	-	-

[1]AUID: Assessment Unit Identification Number (MPCA 2024b)
[2]Includes the entire Route Width which is generally 1,000 feet wide (500 feet on either side of the Application Alignments) and encompasses the ROW.

7.4.6.1.3 North Segment

Route Option North 1 crosses one impaired river, Little Chippewa River, and no impaired lakes. There are no impaired waterbody crossings under Route Option North 2. Table 7.4-10 lists the impaired waterbodies crossed by the North Segment.

Table 7.4-10 Impaired Waterbodies Crossed by the North Segment

Waterbody Name	AUID[1]	Impairment	No. of Crossings in Route Option[2]	No. of Crossings in ROW
Route Option North 1				
Little Chippewa River	07020005-745	• Dissolved oxygen	1	1
Route Option North 2				
None	-	-	-	-

[1]AUID: Assessment Unit Identification Number (MPCA 2024b)
[2]Includes the entire Route Width which is generally 1,000 feet wide (500 feet on either side of the Application Alignments) and encompasses the ROW.

7.4.6.2 Water Quality Standards

Under the CWA, individual states have the primary responsibility for establishing, reviewing, and revising water quality standards, which consist of the designated uses of a waterbody, the numerical values or narrative water quality criteria necessary to protect those designated uses, and an antidegradation policy (40 CFR §§ 131.10 - 131.12 and 131.4). The purpose of the antidegradation provisions at Minn. R. 7050.0250 and 7050.0335 is to achieve and maintain the highest possible quality in surface waters of the state.

The MPCA is the agency charged with classifying waterbodies in Minnesota. Consistent with the requirements of the CWA, the MPCA has established water quality standards, including the identification of beneficial uses of the state's waters, numeric standards and narrative criteria, and non-degradation protections for high-quality or unique waters. Minnesota advances the CWA's presumption that a waterbody should attain healthy aquatic life and recreation uses and groups the waters of the state into one or more of the following seven designated use classifications per Minn. R. 7050.0140:

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

Section 401 of the CWA grants state agencies the authority to require projects that discharge to jurisdictional waters to require a Water Quality Certification and comply

with state and federal water quality regulations. The MPCA is granted the authority to implement Section 401 regulations.

The impaired streams and lakes crossed by the Route Options are classified in Minn. R. 7050.0470 as all beneficial uses except for Class 7 (Table 7.4-11). These classes include uses for domestic consumption (Class 1), aquatic life and recreation (Class 2), industrial consumption (Class 3), agricultural and wildlife (Class 4), aesthetics and navigation (Class 5), and other uses (Class 6) (Minn. R. 7050.0470). Waters crossed by the Route Options that are not explicitly listed under Minn. R. 7050.0470 are classified as warm water habitat – lakes and streams (Class 2B), industrial consumption (Class 3), agriculture and wildlife - irrigation (Class 4A), agriculture and wildlife – livestock and wildlife (Class 4B), aesthetic enjoyment and navigation (Class 5), and other uses (Class 6) (Minn. R. 7050.0415).

Table 7.4-11 Beneficial Use Classifications for Impaired Waterbodies Within the Route Options

Impaired Waterbodies	Route Option	County	Beneficial Use Classifications[1]
Artichoke Lake[2]	South 2	Big Stone	2B, 3C, 4A, 4B, 5, 6
Chippewa River	Central 1, Central 2	Pope	2Bg, 3C, 4A, 4B, 5, 6
Judicial Ditch 9	Central 2	Pope	2Bg, 3C, 4A, 4B, 5, 6
Little Chippewa River	Central 1, Central 2, North 1	Pope	2Bg, 3C, 4A, 4B, 5, 6
Little Chippewa River	North 1	Pope	2Bg, 3C, 4A, 4B, 5, 6
Minnesota River	South 1, South 2	Big Stone	1C, 2Bdg, 3C, 4A, 4B, 5, 6
Pomme De Terre River	South 1, South 2	Swift	2Bg, 3, 4A, 4B, 5, 6
South Drywood Lake[2]	South 2	Big Stone	2B, 3C, 4A, 4B, 5, 6
Stony Run	South 1, South 2	Big Stone	2Bg, 3C, 4A, 4B, 5, 6

[1]Beneficial Use Classifications: 1C Domestic Consumption (requires heavy treatment); 2Bdg Aquatic Life and Recreation also protected as a source of drinking water - General Warm Water Habitat (lakes and streams); 2Bg Aquatic Life and Recreation - General Warm Water Habitat (lakes and streams); 3 Industrial Consumption; 3C Industrial Consumption(heavy treatment);4A Agriculture and Wildlife (irrigation); 4B Agriculture and Wildlife (livestock and wildlife); 5 Aesthetic Enjoyment and Navigation; 6 Other Uses

[2]Minn. R. 7050.0430 Unlisted Waters states, "all surface waters of the state that are not listed in part 7050.0470 and that are not wetlands as defined in part 7050.0186, subp. 1a, are classified as class 2B, 3C, 4A, 4B, 5, and 6 waters".

Minnesota designates some surface waters as ORVWs because of their exceptional qualities (MPCA 2023). As specified in Minnesota Rules, wild, scenic, and recreational river segments comprise a part of the definition of ORVWs. No ORVWs are located within the Route Options.

Artichoke Lake, crossed by Route Option South 2, is the only waterbody along the Project that is considered a Lake of Biological Significance (MNGC 2024h) with a moderate rating. No Lakes of Biological Significance were identified along any of the other

Route Options or Connector Segments. Lakes of Biological Significance are ranked based on unique plant and animal presence.

7.4.6.3 Impacts and Mitigation

The construction of the Project could result in short-term, minor impacts to water quality. Appropriate erosion and sediment control measures will be implemented to minimize the likelihood of erosion and sedimentation in the construction areas and waters. Although minimized to the maximum extent practicable, increased turbidity and localized, minor sedimentation of the stream bottom could occur from runoff. These impacts are expected to be temporary and to not significantly alter water quality conditions due to the minimal soil disturbance that is expected to occur in any one location during construction of the Project.

Consistent with MDNR's recommendations for Artichoke Lake (**Appendix F**), the Applicants will avoid lakebed disturbance and will span Artichoke Lake if required upon selection of the final route. Additional avoidance and minimization measures related to sediment and erosion control, invasive species management, herbicide use, and vegetation removal are detailed in **Section 6.2** and **Section 6.4**.

The Applicants will apply for a NPDES permit from the MPCA and will develop a SWPPP that will identify BMPs to be implemented during construction to minimize erosion and sedimentation impacts to impaired surface waters. Erosion and sedimentation abatement measures, for example, would be employed to decrease impacts to the hydrology in the vicinity of the Project. No fueling or maintenance of vehicles or application of herbicides would occur within 100 feet of streams, ditches, and waterways to protect against introduction of these materials into surface or groundwater systems. Materials such as fuels, lubricants, paints, and solvents required for construction would be stored away from surface water resources according to appropriate regulatory standards and incidental spills or leaks would be mitigated immediately.

7.4.7 Groundwater

Minnesota is divided into six groundwater provinces which are distinguished by the thickness, lateral extent, permeability, and porosity of the underlying bedrock. Aquifers within these provinces include bedrock and unconsolidated sediments such as clay, sand, and gravel that allow for lateral and vertical water movement within and between the component layers of the aquifer. Three groundwater provinces, including the Western, Arrowhead/shallow bedrock, and Central provinces, are a source of water for the Project Study Area (MDNR 2021a).

The Central groundwater province occurs beneath the central/north central part of Minnesota and is present in Douglas, Pope, Stevens, Swift, and Big Stone counties. The Central province is characterized by buried sand aquifers and relatively extensive superficial sand plains and is underlain by sedimentary bedrock with good aquifer properties.

The Western province includes 42 counties including Big Stone, Stevens, Pope, and Swift counties in the Project Study Area. The Western province is demarcated by fine-grained sediment containing limited extents of surficial and buried sand aquifers.

The Arrowhead/shallow bedrock province includes 30 counties in the northeastern, central, and southwestern parts of the state. The Arrowhead/shallow bedrock province is present in the Project Study Area in Big Stone County and is defined by thin glacial sediment overlying thick carbonate and sandstone bedrock prone to conduits, sinkholes, and caves. There are no known karst features within the Study Area (MDNR 2024t).

The USEPA defines a Sole Source Aquifer (SSA) as an aquifer that supplies at least 50 percent of the drinking water consumed in an area (USEPA 2023). Localities within the range of these aquifers have limited options for drinking water supplies apart from the SSA, and if the SSA is contaminated, it could create a significant hazard to public health (MDH 2023a, USEPA 2022). No SSAs have been identified within the Project Study Area (USEPA 2022).

Under the Safe Drinking Water Act, Minnesota lists Wellhead Protection Areas (WHPAs) where contaminants have the potential to infiltrate and pollute groundwater sources. WHPAs for public and community water-supply wells are delineated based on existing groundwater flow models or by using calculations based on a projected 10-year water demand, the effective porosity of the associated aquifer, and the length of the proposed well screen (MDH 2021). A search for WHPAs in the MDH database indicated that Route Option South 1 and South 2 cross one WHPA identified as Odessa (*see* **Appendix D-1**).

The Minnesota County Well Index maintained by the Minnesota Geological Survey in cooperation with MDH, provides a complete, up-to-date list of well locations in Minnesota (MDH 2023b). The 2022 CWI index indicates 14 wells exist within the Route Widths of the Route Options; none of the identified wells are water supply wells within the ROW. Ten wells are classified as domestic use wells (Minnesota Geological Survey 2022).

7.4.7.1 Impacts and Mitigation

Wells in the area range from 15 feet to 362 feet deep below ground surface. Transmission line structure foundations will generally range from 25 feet to 80 feet in depth. All foundation materials would be non-hazardous materials. The Applicants do not anticipate any impacts to groundwater resources during construction or operation of the Project. The Applicants will conduct soil borings as part of geotechnical analyses and evaluate water levels at structure locations within the identified Odessa WHPA. The Applicants will coordinate with MDH and other relevant agencies to identify potential impacts, avoidance strategies, and/or specific mitigation measures (e.g., spanning/structure placement, foundation installation options) as applicable.

In areas where groundwater seeps into the excavation, or where water is needed to hold the hole during drilling, it may be necessary to dewater the excavation. Depending on site conditions, the water may be de-silted and discharged to an upland area where it is allowed to re-infiltrate or removed from the site via a tank truck. Dewatering will proceed in accordance with applicable regulations and permit requirements. No water supply is required for construction or operation of the Regeneration Station.

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. Based on currently known karst areas, karst is not anticipated to be encountered. 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.

7.4.8 Wetlands

Wetlands are defined as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support [...] a prevalence of vegetation typically adapted for life in saturated soil conditions” (USACE 1987). Most formal wetland definitions emphasize three primary components that define wetlands: the presence of water, hydric soils, and hydrophytic vegetation.

Wetlands are part of the foundation of water resources and are vital to the health of waterways and communities that are downstream. Wetlands detain floodwaters, attenuate water flow, recharge groundwater supplies, remove pollution, and provide fish and wildlife habitat. Wetlands are also economic drivers because of their key role in fishing, hunting, agriculture, and recreation. Freshwater wetlands are dynamically complex natural systems and vary widely due to differences in soils, topography, climate,

hydrology, water chemistry, and vegetation, resulting in a variety of distinguishable classification types such as swamps, marshes, meadows, bogs, and fens.

In addition to rivers, streams, and lakes, wetlands may also be listed on the PWI in Minnesota (Minn. Stat. § 103G.005, subd. 15a). Public waters wetlands include inland shallow fresh marshes, inland deep fresh marshes, and inland open fresh water that are ten or more acres in size in unincorporated areas or 2.5 or more acres in incorporated areas (Minn. Stat. § 103G.005, subd. 15a; USFWS 1971). A Minnesota Public Waters Work Permit is required for any impacts below the OHWL to PWI wetlands on private lands.

Calcareous fens are rare and 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 rare plant communities. According to the MDNR's Identification List of Known Calcareous Fens (MDNR 2021b), there are no known calcareous fens located within the Route Width of the Route Options (MDNR 2021b). The nearest calcareous fen is approximately 0.92 mile south of the Application Alignment of Route Option South 1 and 0.42 mile south of the Application Alignment of Route Option South 2 in Big Stone County. The Applicants met with MDNR on September 24, 2024. During discussions, MDNR noted that calcareous fens within 5 miles of the Project will need additional mitigation as discussed in **Section 7.4.8.4**. The Applicants will coordinate with MDNR to mitigate potential Project-related impacts to calcareous fens in the vicinity of the Project.

The USFWS NWI data (USFWS 2024b) was reviewed to assess the presence of NWI-mapped wetlands along the Route Options (no field surveys or formal delineations have been performed). According to the NWI data (USFWS 2024b), wetlands are present throughout each Route Segment. Many of the NWI-mapped wetlands are associated with riverine and floodplain ecosystems or are in localized depressions. There are several wetland classification systems used in Minnesota, however the two most common are the Cowardin Classification and Circular 39 (MDNR 2024k). The Cowardin Classification was developed by the USFWS in 1979 and describes wetland types by system (e.g., marine, estuarine, lacustrine, palustrine), subsystem (e.g., subtidal/intertidal, limnetic/littoral), class (e.g., emergent, scrub-shrub, forested), and subclass (substrate or vegetation type) (Cowardin et al. 1979). The Circular 39 system was developed by the USFWS in 1956 and categorizes wetlands into eight distinct types, with differences in water depth and variety of vegetation. The Circular 39 system is referenced in a number of Minnesota statutes (MDNR 2024k). Table 7.4-12 below provides the eight Circular 39 wetland types found

in Minnesota and their respective Cowardin Classification codes. No Type 8 wetlands were identified by the NWI for any Route Options.

Table 7.4-12 Cowardin Classification Codes by Circular 39 Wetland Type

Circular 39 Wetland Type	Applicable Cowardin Classification Codes
Type 1: Seasonally Flooded Basins or Floodplains	PEMA, PUS, PFOA
Type 2: Wet Meadows	PEMB, PSSB
Type 3: Shallow Marshes	PEMC, PEMF, PSSH, PUBA, PUBC
Type 4: Deep Marshes	L2ABF, L2EMF, L2EMG, L2US, PABF, PABG, PEMG, PEMH, PUBB, PUBF
Type 5: Open Water Wetlands	L1, L2ABG, L2ABH, L2EMA, L2EMB, L2EMH, L2RS, L2UB, PABH, PUBG, PUBH
Type 6: Shrub Swamps	PSSA, PSSC, PSSF, PSSG, PSS1, PSS5, PSS6B
Type 7: Wooded Swamps	PFO1, PFO5, PFO6B, PFOC, PFOF
Type 8: Bogs[1]	PFO2, PFO4, PFO7B, PSS2, PSS3, PSS4, PSS7B

Source: MDNR 2024k
[1]No Type 8 wetlands were identified from the NWI for any of the Route Options.

7.4.8.1 South Segment

The Circular 39 wetland types found along the South Segment Route based on the NWI geospatial data and classifications, are provided in Table 7.4-13 and discussed in the following sections.

Table 7.4-13 Wetlands Potentially Present Within the South Segment

Circular 39 Wetland Type	Acreage within Route Option	Acreage within ROW*
Route Option South 1		
Type 1: Seasonally Flooded Basins or Floodplains	318.7	27.9
Type 2: Wet Meadows	17.0	1.4
Type 3: Shallow Marshes	89.6	12.7
Type 4: Deep Marshes	20.6	1.2
Type 5: Open Water Wetlands	52.9	6.7
Type 6: Shrub Swamps	12.6	4.1
Type 7: Wooded Swamps	4.4	0.4
Total	*515.7*	*54.5*
Route Option South 2		
Type 1: Seasonally Flooded Basins or Floodplains	291.7	44.1
Type 2: Wet Meadows	17.9	3.7
Type 3: Shallow Marshes	149.4	23.6
Type 4: Deep Marshes	22.9	4.0
Type 5: Open Water Wetlands	29.2	1.2
Type 6: Shrub Swamps	9.2	0.0
Type 7: Wooded Swamps	1.1	0.5
Unclassified (artificially flooded wetlands)	25.1	0.0
Total	*546.6*	*77.0*

Circular 39 Wetland Type	Acreage within Route Option	Acreage within ROW*
Connector Segment S16		
Type 1: Seasonally Flooded Basins or Floodplains	9.8	1.6
Type 3: Shallow Marshes	8.2	0.7
Type 4: Deep Marshes	1.6	0.1
Unclassified (artificially flooded wetlands)	2.9	0.0
Total	*22.5*	*2.3*
Connector Segment S17		
Type 1: Seasonally Flooded Basins or Floodplains	5.7	0.3

*The Route Option consists of the 1,000-ft Route Width, which encompasses the 150-ft wide ROW.

Route Option South 1

The NWI identified a total of 515.7 acres of wetlands within Route Option South 1, the majority of which consists of Circular 39 wetland Type 1 (seasonally flooded basins or floodplains) comprising wetlands with emergent vegetation (such as grasses and sedges), unconsolidated shores (areas of substrates mostly lacking vegetation and subject to erosion and deposition action), and forested floodplain wetlands that contain water for relatively short periods primarily in the spring or after heavy rains. Type 1 wetlands are found in upland depressions (in the case of seasonally flooded basins) or along rivers and streams (such as floodplain forests). Within the Route Option South 1 ROW, a total of 54.5 acres of wetlands were identified by the NWI, also dominated by Type 1 wetlands and followed by Type 3 wetlands (shallow marshes). Shallow marshes often have waterlogged or flooded soil in the spring with a variety of emergent and submergent vegetation such as grasses, sedges, cattails, arrowhead, pickerelweed, and smartweed. Shallow marshes are found in shallow lake basins or sloughs, or may border deep marshes, lakes, and river backwaters.

Route Option South 2

Route Option South 2 crosses a total of 546.6 acres of NWI wetlands dominated by Type 1 and Type 3 wetlands, followed by Type 5 (open water wetlands) and Type 4 (deep marshes). Open water wetlands include shallow ponds and reservoirs with water less than six feet type and fringed by a border of emergent vegetation. Open water wetlands are found in shallow lake basins or may border large open water basins. Deep marshes are similar to shallow marshes (Type 3 wetlands) but with water depths from six inches to three feet during the spring and summer. Deep marshes are found in shallow lake basins, potholes, limestone sinks and sloughs, or may border open water in lakes and river backwaters. Due to the deepwater habitats, vegetation composition in Type 4 wetlands also varies from Type 3. Route Option South 2 also crosses several wetlands that are not classified by the Circular 39 system due to their water regime designation, which is for

artificially flooded wetlands (25.1 acres in total). These wetlands primarily consist of freshwater ponds that are artificially flooded and likely resemble Circular 39 Type 5 wetlands. Within the ROW, 77.0 acres are crossed consisting primarily of Type 1 and Type 3 wetlands.

Connector Segment S16

Connector Segment S16 encompasses a total of 22.5 acres wetlands identified from the NWI including Type 1, Type 3, and Type 4 wetlands. It also crosses one unclassified wetland (2.9 acres) that likely resembles a Type 5 wetland (open water wetland). Within the ROW of Connector Segment S16, 2.3 acres of NWI wetlands are crossed consisting mainly of Type 1 wetlands, followed by Type 3 and Type 4 wetlands. The unclassified wetland is avoided.

Connector Segment S17

Connector Segment S17 crosses 5.7 acres of NWI wetlands classified as Type 1 wetlands. Within the ROW for Connector Segment S17, only 0.3 acre of wetlands are crossed.

7.4.8.2 Central Segment

The Circular 39 wetland types found along the Central Segment Route Options and Connector Segment, based on the NWI geospatial data and classifications, are provided in Table 7.4-14 and discussed in the following sections.

Table 7.4-14 Wetlands Potentially Present Within the Central Segment

Circular 39 Wetland Type	Acreage within Route Option	Acreage within ROW*
Route Option Central 1		
Type 1: Seasonally Flooded Basins or Floodplains	83.9	4.7
Type 2: Wet Meadows	1.5	5.9
Type 3: Shallow Marshes	53.1	0.2
Type 4: Deep Marshes	1.3	1.2
Type 5: Open Water Wetlands	10.5	0.3
Type 6: Shrub Swamps	7.9	1.2
Type 7: Wooded Swamps	6.0	4.7
Total	*164.1*	*13.5*
Route Option Central 2		
Type 1: Seasonally Flooded Basins or Floodplains	117.1	8.0
Type 2: Wet Meadows	3.8	0.5
Type 3: Shallow Marshes	76.6	7.4
Type 4: Deep Marshes	5.5	0.0
Type 5: Open Water Wetlands	4.8	0.0
Type 6: Shrub Swamps	4.3	0.6
Type 7: Wooded Swamps	8.6	1.3

Circular 39 Wetland Type	Acreage within Route Option	Acreage within ROW*
Unclassified (artificially flooded wetlands)	2.5	0.0
Total	*223.2*	*17.8*
Connector Segment C11		
Type 1: Seasonally Flooded Basins or Floodplains	1.4	0.4
Type 3: Shallow Marshes	4.2	0.3
Type 5: Open Water Wetlands	1.2	0.0
Total	*6.8*	*0.7*

*The Route Option consists of the 1,000-ft Route Width, which encompasses the 150-ft wide ROW.

Route Option Central 1

Route Option Central 1 encompasses a total of 164.1 acres of NWI wetlands comprising 83.9 acres of Type 1, 53.1 acres of Type 3, and lesser portions of all other types (except Type 8 which was not identified in the NWI geospatial data for any Route Segment). Within the Route Option Central 1 ROW, only 13.5 acres of wetlands are crossed and are dominated by Type 1, Type 2 (wet meadows), and Type 7 (wooded swamps) wetlands. Wet meadows are characterized by low-growing grass, sedge, or rush vegetation communities with broad-leaved plants. They can also include calcareous fens and are found along borders of streams, lakes and marshes, in small depressions, and in extensive flats on glacial lake beds. Wooded swamps have soil that is waterlogged within a few inches of the surface during the growing season or inundated up to a foot of water. They are forested with species such as tamarack, white cedar, arborvitae, black spruce, balsam, red maple, and black ash, and are found in shallow ancient lake basins, old riverine oxbows, flat terrains, or along sluggish streams.

The Route Option Central 1 ROW crosses 13.5 acres of NWI wetlands dominated by Type 2, Type 1, and Type 7 wetlands.

Route Option Central 2

Route Option Central 2 crosses a total of 223.2 acres of NWI wetlands dominated by Type 1 and Type 3 wetlands, followed distantly by all wetland types (except Type 8) and unclassified wetlands. The number of wetlands crossed by the Route Option Central 2 ROW is reduced to 17.8 acres primarily consisting of Type 1 and Type 3 wetlands.

Connector Segment C11

Connector Segment C11 crosses a total of 6.8 acres of wetlands identified on the NWI consisting of Type 1, Type 3, and Type 5 wetlands. Within the ROW associated with Connector Segment C11, only 0.4 acre of Type 1 and 0.3 acre of Type 3 wetlands are crossed.

7.4.8.3 North Segment

The Circular 39 wetland types found along the North Segment Route Options based on the NWI geospatial data and classifications are provided in Table 7.4-15 and discussed in the following sections.

Table 7.4-15 Wetlands Potentially Present Within the North Segment

Circular 39 Wetland Type	Acreage within Route Option	Acreage within ROW
Route Option North 1		
Type 1: Seasonally Flooded Basins or Floodplains	146.3	20.7
Type 3: Shallow Marshes	76.0	12.4
Type 4: Deep Marshes	10.7	1.7
Type 5: Open Water Wetlands	49.0	4.5
Type 6: Shrub Swamps	6.3	1.6
Type 7: Wooded Swamps	3.3	0.7
Unclassified (artificially flooded wetlands)	4.4	0.0
Total	*296.1*	*41.5*
Route Option North 2		
Type 1: Seasonally Flooded Basins or Floodplains	117.9	12.0
Type 2: Wet Meadows	9.6	0.4
Type 3: Shallow Marshes	221.5	36.5
Type 4: Deep Marshes	44.6	6.0
Type 5: Open Water Wetlands	28.5	0.8
Type 6: Shrub Swamps	29.2	5.5
Type 7: Wooded Swamps	8.7	1.1
Total	*460.0*	*62.2*

*The Route Option consists of the 1,000-ft Route Width, which encompasses the 150-ft wide ROW.

Route Option North 1

Approximately 296.1 acres of wetlands were identified from the NWI as potentially crossed by Route Option North 1. The majority of wetlands crossed consist of Type 1 wetlands, followed by Type 3 and Type 5 wetlands. Approximately 41.5 acres of wetlands are crossed by the Route Option North 1 ROW, half of which consist of Type 1 wetlands followed by Type 3 and Type 5 wetlands.

Route Option North 2

Route Option North 2 crosses 460.0 acres of wetlands according to the NWI geospatial files. Type 3 wetlands comprise the greatest portion of wetland types (221.5 acres), following by Type 1 wetlands at 117.9 acres and Type 4 wetlands at 44.6 acres. Within the Route Option North 2 ROW, approximately 62.2 acres of wetlands would be crossed primarily consisting of Type 3 and Type 1 wetlands.

7.4.8.4 Impacts and Mitigation

The potential effects of construction and operation upon wetlands will be minimized by implementation of BMPs and the Applicants' compliance with relevant permits and authorizations. Appropriate erosion and sediment control measures will be implemented to minimize the likelihood of erosion and sedimentation in the construction areas and nearby waters. The Applicants will apply for an NPDES permit from the MPCA and will develop a SWPPP that will identify BMPs to be implemented during construction to minimize erosion and sedimentation impacts to wetlands.

Impacts to wetlands, streams, and surface waterbodies will be avoided or minimized to the extent practicable. During final design, the Applicants will design the transmission facilities to span wetlands to the extent practical. Many wetlands may be located abutting or adjacent to streams, creeks, or rivers, which are often in topographically lower areas and may be more easily avoided by locating structures at higher elevations, spanning wetland areas.

No calcareous fens are crossed by the proposed Route Options. The Applicants met with MDNR staff to discuss calcareous fens (see also **Sections 8.1.2** and **8.1.2.3**). MDNR is interested in calcareous fens located within five miles of the proposed Route Options and potential impacts to water levels within such locations. MDNR is interested in geologic, ground water level data, confining layers noted in the geologic data, boring records within one and a half mile of a fen, foundation information, and construction plans related to the Project near the calcareous fen locations.

Calcareous fens near the Project may be affected by construction activities that impact surface waters or groundwater including soil borings as part of geotechnical analyses that will evaluate water levels at proposed structure locations. The Applicants will coordinate with MDNR prior to soil boring activities within 5.0 miles of a calcareous fen. The Applicants will provide requested data (e.g., water depth, soil boring log) to MDNR and will coordinate with MDNR to identify potential impacts, avoidance strategies, and/or specific mitigation measures as applicable based on the results of the soil borings. Additionally, as described in **Section 7.4.5.4**, the Project will have minor, mostly short-term, effects on surface water resources. The Applicants will design the Project to avoid or minimize impacts to surface water resources to the extent feasible, including minimizing potential stormwater impacts. Potential impacts and proposed mitigation measures to groundwater resources are described in **Section 7.4.7.1**. The Applicants will coordinate with MDNR to mitigate potential Project-related impacts to calcareous fens in the vicinity of the Project.

Temporary impacts are anticipated to be mitigated by returning disturbed areas to preconstruction elevations, stabilizing soils with erosion control measures, and revegetating disturbed areas with appropriate species for long-term soil stability and decreased erosion potential. The Applicants will maintain 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 the AIMP and VMP. Unavoidable permanent wetland impacts due to the installation of structure foundations or permanent changes in wetland functionality will be mitigated for as determined through consultation with the USACE, MDNR, and other state and federal agencies as appropriate.

The Applicants will obtain all appropriate permits and approvals from the USACE, MDNR, local government unit(s), and watershed districts (if necessary) for any actions proposed to occur in wetlands.

7.4.9 Soil resources

Soil characteristics along the Route Options were assessed using the USDA - NRCS Soil Survey Geographic (SSURGO) database (USDA, 2024). Soils within the ROW of the Route Options are generally loamy, silty clay loam, sandy loam or clay loam, are typically used for agricultural purposes, and range from very poorly drained to well-drained.

The USDA-NRCS SSURGO Database identifies farmland soils based on three categories, which are subject to protection under the Farmland Protection Policy Act. 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, fiber, and oilseed crops, and is also available for these uses (the land could be cropland, pasture, woodland, or other lands) (NRCS, 7 CFR Part 657). Urbanized land and open water cannot be designated as prime farmland. Prime farmland typically contains few or no rocks, is permeable to water and air, is not excessively erodible or saturated with water for long periods and is not subject to frequent or prolonged flooding during the growing season.

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. Farmlands of statewide importance have the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high

quality or high yields of specific crops when treated and managed according to acceptable farming methods.

Soil characteristics crossed by the ROWs of each Route Option are presented in Table 7.4-16, Table 7.4-17, and Table 7.4-18. ROW was chosen as the impact parameter due to permanent construction impacts only anticipated within the respective ROWs.

7.4.9.1 South Segment

Table 7.4-16 provides a summary of soil characteristics along the Route Options in the South Segment.

Table 7.4-16 Summary of Soil Characteristics in the South Segment[1]

	Route Option South 1 (acres)	Route Option South 2 (acres)	Connector Segment S16 (acres)	Connector Segment S17 (acres)	Segment Alternative S18 (acres)
All areas are prime farmland	2,828.9	2,137.5	0	59.3	221.6
Farmland of Statewide Importance	233.3	218.8	5.0	5.0	37.9
Prime Farmland if Drained	2,320.9	1,838.7	74.4	21.4	54.0
Prime Farmland if protected from Flooding	58.1	0	0	0	0
Not Prime Farmland	501.9	448.8	3.2	0	0

Note: Soils may have more than one characteristic.
[1] Calculations represent the Route Option, including the approximately 1,000 foot Route Width. The 150-foot ROW is encompassed within the Route Width.

7.4.9.2 Central Segment

Table 7.4-17 provides a summary of soil characteristics along the Route Options in the Central Segment.

Table 7.4-17 Summary of Soil Characteristics in the Central Segment[1]

	Route Option Central 1 (acres)	Route Option Central 2 (acres)	Connector Segment C11 (acres)
All areas are prime farmland	2,684.3	3,514.7	172.5
Farmland of Statewide Importance	343.2	446.1	0
Prime Farmland if Drained	1,074.2	2,641.1	31.5
Prime Farmland if protected from Flooding	0	0	0
Not Prime Farmland	120.3	113.6	0

Note: Soils may have more than one characteristic.
[1]Calculations represent the Route Option, including the approximately 1,000 foot Route Width. The 150-foot ROW is encompassed within the Route Width.

7.4.9.3 North Segment

Table 7.4-18 provides a summary of soil characteristics along Route Options in the North Segment.

Table 7.4-18 Summary of Soil Characteristics in the North Segment[1]

	Route Option North 1 (acres)	Route Option North 2 (acres)	Segment Alternative N9 (acres)	Segment Alternative N10 (acres)	Segment Alternative N11 (acres)
All areas are prime farmland	1,433.0	778.2	276.6	129.1	18.5
Farmland of Statewide Importance	379.3	1,216.6	14.4	60.8	154.2
Prime Farmland if Drained	525.9	573.6	67.1	40.9	37.2
Prime Farmland if protected from Flooding	0	0	0	0	0
Not Prime Farmland	262.1	430.4	28.2	43.1	58.0

Note: Soils may have more than one characteristic.

[1] Calculations represent the Route Option, including the approximately 1,000 foot Route Width. The 150-foot ROW is encompassed within the Route Width.

7.4.9.4 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 the AIMP (**Appendix K**) and VMP (**Appendix J**).

Some Project components will traverse prime farmland, prime farmland if drained, and/or farmland of statewide importance, as noted in Table 7.4-16, Table 7.4-17, and Table 7.4-18. Permanent impacts include the areas that will be taken

out of production at the structure locations or at the Regeneration Station. 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 ROW, 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.

7.4.10 Vegetation resources

As discussed in **Section 7.1**, Route Options within the Project Study Area lie within both the Prairie Parkland Province and the Eastern Broadleaf Forest Province as defined by the ECS of Minnesota (MDNR 2024a; MDNR 2024d). More specifically, portions of all Route Options lie within the Minnesota River Prairie Subsection. Before European Settlement, vegetative communities throughout the region were mainly tallgrass prairie with islands of wet prairie. Portions of the Big Stone Moraine supported dry and dry-mesic prairie. Along streams and within floodplains of the Minnesota River valley, pre-settlement forests were dominated by silver maple *(Acer saccharinum*), elm species *(Ulmus* spp.), cottonwood (*Populus deltoides*), and willow species (*Salix* spp.). There were also dry gravel prairies on kames. Vegetation in these areas is now dominated by agriculture; tallgrass prairie remnants are rare and isolated (MDNR 2023c).

Portions of Route Options North 1 and North 2 lie within the Hardwood Hills Subsection. The Hardwood Hills Subsection historically consisted of irregular topography and presence of numerous lakes and wetlands which provided a partial barrier to fire, resulting in woodland or forest rather than prairie vegetation. A mosaic of tallgrass prairie, aspen-oak land, and oak openings or savanna was present along the prairie boundary to the west (MDNR 2024f). Mixed forests of oaks (*Quercus* spp.), sugar maple, American basswood (*Tilia americana*), and other hardwoods were present in fire protected sites farther east. Tallgrass prairie grew on more level terrain within the subsection. Today, agriculture is the dominant land use. While many wetlands have been drained, prairie potholes remain and provide habitat for waterfowl and shorebirds. Important areas of forest and prairie exist throughout the subsection, but they are small and fragmented (MDNR 2024f; MDNR 2006).

Agricultural areas found within the Project Study Area include active corn and soybean row crop fields interspersed with wind breaks, woodlots, fence rows, and grassland swales associated with drainage ditches. Suitable habitat for a variety of at-risk plant and animal species may be present in these areas.

7.4.10.1 Impacts and Mitigation

The acreage of each land cover type crossed by the Route Options is provided in **Section 7.2.1**. Impacts to vegetation along the Route Options will primarily be associated with impacts to agricultural areas; *see* **Section 7.3.1.1** for a discussion of impacts and mitigation measures that would be used in cropland and pasturelands.

Impacts to vegetation associated with recreational areas crossed by the Route Options are discussed in **Section 7.2.10**.

Other potential impacts to vegetation will occur where clearing of trees and other vegetation is necessary for Project construction, maintenance, and safe operation of the transmission line and associated ROW. Permanent removal of vegetation will occur in areas where new structures are proposed and in the location of the new Regeneration Station.

As routing for the Project is further refined, the Applicants will avoid, when feasible, large forested areas and other sensitive native vegetation resources to the extent practicable and will work with agencies to develop the appropriate BMPs and mitigation measures to minimize potential impacts to vegetation resources from the Project facilities.

Permanent vegetation impacts associated with the Project are not likely to have long-term effects on plant communities in the vicinity of the Project. The communities potentially impacted by construction of the Project are well-represented in the general vicinity of the Project, and throughout the transmission line ROW. Areas where MDNR NPCs and Rare Natural Communities are found will be considered by the Applicants in order to avoid direct impacts from permanent structure foundations and temporary impacts from construction. The Applicants have consulted with MDNR regarding the location of structure foundations relative to identified MBS sites, NPCs, and other areas of significance to MDNR, such as the Minnesota River crossing. The Applicants will continue to work with the MDNR to refine the Route Options and reduce impacts to MBS Sites and NPCs.

Once the Project is constructed, Project operations and maintenance activities will likely continue to affect vegetation resources, but at a lower level of intensity than during construction. These activities will likely include periodic vegetation management along the proposed transmission corridors and access areas, as well as periodic access for maintenance and repair of the facilities in the surrounding vegetation.

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. §§ 18.75-18.91, 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 Route Options 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 the Applicants' VMP (**Appendix J**).

7.4.11 Wildlife Resources

The Route Options are inhabited by a variety of wildlife species and provide a range of habitats. Wildlife species that inhabit the Project Study Area are typical of those found in rangelands, deciduous forest patches, wetlands, grasslands, and habitat transition zones frequently associated with agricultural, rural, exurban, and suburban areas. Homesteads, farmsteads, wind rows, pastures, and waterbodies may provide ideal habitat for a variety of wildlife species adapted to areas dominated by agriculture and human settlement. Wildlife species common to the Project Study Area are shown in Table 7.4-19.

Table 7.4-19 Wildlife Species Common to the Project Study Area

Common Name	Scientific Name
Mammals	
White-tailed deer	*Odocoileus virginianus*
Coyote	*Canis latrans*
Red fox	*Vulpes vulpes*
Eastern cottontail	*Sylvilagus floridanus*
Striped skunk	*Mephitis mephitis*
Northern raccoon	*Procyon lotor*
Muskrat	*Ondatra zibethicus*
Gray Squirrel	*Sciurus carolinensis*
Deer Mouse	*Peromyscus maniculatus*
Virginia opossum	*Didelphis virginiana*
Chipmunk	*Tamias striatus*
Masked shrew	*Sorex cinereus*
Short-tailed shrew	*Blarina brevicauda*
Star-nosed mole	*Condylura cristata*
Little brown myotis	*Myotis lucifugus*
Red bat	*Lasiurus borealis*

Common Name	Scientific Name
Hoary bat	*Aeorestes cinereus*
Gray fox	*Urocyon cinereoargenteus*
Birds	
Wild turkey	*Meleagris gallopavo*
Canada goose	*Branta canadensisalden*
Eastern bluebird	*Sialia sialis*
Barred owl	*Strix varia*
Ring-necked pheasant	*Phasianus colchicus*
Red-tailed hawk	*Buteo jamaicensis*
Broad-winged hawk	*Buteo platypterus*
American robin	*Turdus migratorius*
Brown-headed cowbird	*Molothrus ater*
Mallard	*Anas platyrhynchos*
American crow	*Corvus brachyrhynchos*
Red-winged blackbird	*Agelaius phoeniceus*
House wren	*Troglodytes aedon*
Fish	
Largemouth bass	*Micropterus salmoides*
Brown bullhead	*Lepomis macrochirus*
Bluegill	*Ameiurus nebulosus*
Black crappie	*Pomoxis nigromaculatus*
Yellow perch	*Perca flavescens*
Fathead minnow	*Pimephales promelas*
Rock bass	*Ambloplites rupestris*
Pumpkinseed	*Lepomis gibbosus*
Johnny darter	*Etheostoma nigrum*
Reptiles and Amphibians	
American toad	*Anaxyrus americanus*
Northern leopard frog	*Lithobates pipiens*
Tiger salamander	*Ambystoma tigrinum*
Common gartersnake	*Thamnophis sirtalis*
Plains gartersnake	*Thamnophis radix*
Smooth greensnake	*Opheodrys vernalis*
Prairie skink	*Plestiodon septentrionalis*
Painted turtle	*Chrysemys picta*
Snapping turtle	*Chelydra serpentina*

Sources: MDNR 2017a, 2024l, 2024m; Audubon 2024; Herrick 1892

7.4.11.1 Impacts and Mitigation

Project construction activities are expected to have effects on terrestrial resources ranging from permanent conversion of habitats to non-vegetated land cover, to temporary effects resulting from disturbance around permanent Project components. Potential

temporary impacts to wildlife 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 either route. Less mobile wildlife species, such as some small mammals, amphibians, reptiles, and nesting birds may be susceptible to mortality from vehicles and other equipment moving within the ROW.

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 and in the location of the new Regeneration Station.

In addition to temporary and permanent impacts, construction activities can affect wildlife and their habitats in several ways. Displaced individuals can suffer direct or indirect mortality or decreased breeding success. Direct mortality can occur by destruction of occupied burrows, nests, roost sites, and dens during vegetation clearing, excavation, and grading, or by collision with vehicles on roads to and from the Project. Indirect mortality occurs when displaced individuals are killed elsewhere by predators, vehicles, competitors, lack of resources, or exposure. Inconspicuous burrowing and nocturnal species and species with limited mobility are particularly susceptible to displacement and mortality (e.g., amphibians and snakes).

Once the Project is operational, there is potential for avian and transmission line interactions in the form of collisions and electrocution risks to perching birds. Waterfowl are more susceptible to transmission line collisions, especially if the transmission line is placed between agricultural fields that serve as feeding areas, wetlands or open water, WMAs, WPAs, IBAs and Wildlife Refuges, 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 in certain locations where the risk of collision is high.

7.4.12 Rare and Unique Natural Resources

Rare and unique resources include plant and animal species listed at the federal or state level as endangered or threatened. Federally-listed endangered and threatened species are protected under the Endangered Species Act of 1973 (ESA), administered by

the USFWS. State-listed endangered and threatened species are protected under Minn. Stat. § 84.0895, administered by the MDNR. Additionally, rare and unique resources include plant and animal species listed as proposed or candidate listings at the federal level, and as special concern at the state level. These species are not legally protected by federal or state laws; however, USFWS and/or MDNR are typically notified of potential impacts to these species.

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.

Data on federal and state-protected species were reviewed for the Project using the USFWS Information for Planning and Consultation (IPaC) online tool and the MDNR Natural Heritage Inventory System (NHIS) database (License Agreement #2022-034), which is MDNR's Minnesota 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 Route Options. Any review of NHIS data is preliminary until the MDNR conducts a formal consultation and review of state-listed species data, which follows submission of an official Natural Heritage Review request on the MDNR Minnesota Conservation Explorer website. The Applicants submitted a formal MDNR Minnesota Conservation Explorer (MCE) NHIS database request of the Project Study Area and associated Segments to the MDNR on June 3, 2024, and received the results from MDNR on August 22, 2024. The Natural Heritage Review results are described in **Section 7.4.12.2**. As discussed in **Section 4.4**, the Applicants hosted a fourth round of public open houses in June 2024 which resulted in slight modifications to Route Options. The Applicants submitted a supplemental NHIS database request for the modified Route Options to MDNR on September 24, 2024.

7.4.12.1 Federally Protected Species

Federally threatened and endangered species are protected under Section 7 of the ESA.The USFWS IPaC online tool was originally queried on October 13, 2023, for a list of federally threatened and endangered species, proposed species, candidate species, and designated critical habitat that may be present within the Route Options (USFWS 2024c) (**Appendix F**). On October 13, 2023, USFWS provided a record of the no effect determination on the northern long-eared bat for the Project based on information

gathered using the USFWS IPaC. The no effect determination did not apply to critical habitat for the Poweshiek Skipperling (*Oarisma Poweshiek*).

Additional queries to the USFWS IPaC system were made on May 29, 2024 based on the revised Route Options and on August 28, 2024, after an August 8, 2024 Federal Register posting by USFWS announcing the proposed listing of two butterfly species potentially present in the Project Area (USFWS 2024c). In both instances, the Route Width was used for the IPaC query and there was no critical habitat identified within the Route Width. More information regarding consultation with USFWS is provided in **Section 8.1.1.4**.

The August 28, 2024 IPaC query identified the following species with potential to occur within the Route Options: northern long-eared bat (*Myotis septentrionalis;* endangered), tricolored bat (*Perimyotis subflavus;* proposed endangered), rufa red knot (*Calidris canutus rufa*; threatened), Dakota skipper (*Hesperia dacotae*; threatened), Western regal fritillary (*Argynnis idalia occidentalis*; proposed threatened) and monarch butterfly (*Danaus plexippus;* candidate). The IPaC query also identified bald eagles and several migratory birds as potentially present in the Route Options. A summary of federally listed species with the potential to occur within the Route Options is presented below and in Table 7.4-20.

Table 7.4-20 Federally Threatened and Endangered Species Potentially Present Along Route Options

Common Name	Scientific Name	Federal Status[1]	Habitat[2]
Birds			
Rufa red knot	*Calidris canutus rufa*	THR	Forages in freshwater wetland and lake edge habitats. This species does not nest in Minnesota.
Mammals			
Northern long-eared bat	*Myotis septentrionalis*	END	Roost in living and dead trees greater than 3 inches in diameter; hibernates in caves and mines.
Tricolored bat	*Perimyotis subflavus*	Proposed END	Roost in live or recently dead deciduous and pine trees; hibernates in caves and mines.
Butterflies			
Dakota skipper	*Hesperia dacotae*	THR	Remnant native prairie habitats.
Western regal fritillary	*Argynnis idalia occidentalis*	Proposed THR	Remnant native prairie habitats
Monarch butterfly	*Danaus plexippus*	CAN	Native-dominated forbs with high milkweed presence.

[1]END = Endangered; THR = Threatened; CAN = Candidate
[2]Habitat information obtained from the MDNR Rare Species Guide (MDNR 2024n).

7.4.12.1.1 Northern Long-Eared Bat

The federally endangered northern long-eared bat roosts in living and dead trees greater than three inches in diameter that have loose or peeling bark, cavities, or crevices during the active season (MDNR 2024o). During winter, they hibernate in caves and mines. There are no records of northern long-eared bats within the counties that the Project intersects (MDNR 2024o), but these records are not exhaustive and potentially suitable summer roosting and foraging habitat may be present within the Route Options.

7.4.12.1.2 Tri-Colored Bat

The tri-colored bat is proposed for listing as endangered under the ESA. This species roosts in caves and abandoned mines during the winter and forested habitats during the rest of the year. Within forested habitats, they roost primarily among leaves of live or recently dead deciduous hardwood trees as well as pine trees and human structures (USFWS 2024d). There are no mapped MDNR records of tri-colored bats within the counties that the Project intersects (MDNR 2024p). However, suitable forested roosting habitat for tri-colored bats may be present within the Route Options.

7.4.12.1.3 Rufa Red Knot

The rufa red knot requires upland tundra habitat for nesting, with low, sparse, herbaceous vegetation, located near freshwater wetland or lake-edge foraging habitats with suitably timed insect hatch to provide abundant prey when chicks are present (USFWS 2023). The rufa red knot is a rare, low-density migrant annually recorded somewhere within the state of Minnesota, most frequently in Duluth or along the larger inland lakeshores in the northern half of the state (e.g. Upper Red Lake, Leech Lake, Mille Lacs, and Lake of the Woods). Within the southern third of Minnesota, rufa red knots occasionally occur at sewage treatment plants and wetland habitats in the prairie region (USFWS 2014). Rufa red knots are unlikely to occur within the Route Options due to its habitat and nesting requirements.

7.4.12.1.4 Dakota Skipper

Dakota skippers inhabit remnants of tallgrass prairie and mixed-grass prairie in the north-central United States where they rely on diverse native grassland plant communities (USFWS 2021). They were recently reintroduced at Glacial Lake State Park, which is approximately seven miles east of the Route Options Central 1 and 2 (MDNR 2024q). The Route Options may intersect native prairie habitat, which could potentially provide suitable habitat for the Dakota skipper (MDNR 2017b).

7.4.12.1.5 Western Regal Fritillary

Western regal fritillary was proposed for listing as a federally-threatened species in August 2024 by the USFWS. This butterfly species is associated with native prairie habitats (MDNR 2024r). Suitable habitat for the western regal fritillary may be present within the Route Options.

7.4.12.1.6 Monarch Butterfly

The monarch butterfly is a federal candidate species and not yet protected under the ESA. They 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. Suitable habitat for monarch butterflies may be present within the Route Options.

7.4.12.1.7 Bald and Golden Eagles

In Minnesota, bald eagles typically inhabit and nest in forested areas near large lakes, reservoirs, and rivers (USFWS 2024e). 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 (USFWS 2024f). Suitable habitat for bald and golden eagles may be present within the Route Options (MDNR 2024i).

7.4.12.1.8 Migratory Birds

The state of Minnesota is in the Central Flyway of North America (the Central Flyway). The Central Flyway is a bird migration route that encompasses the Great Plains of the United States 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 Route Options in agricultural and riparian habitats. The IPaC query identified 28 USFWS Birds of Conservation Concern (BCC) as potentially present along the Route Options (**Appendix F**). 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) and the Migratory Bird Treaty Act of 1918 (16 USC 703- 712) afford protection to BCC.

7.4.12.2 State Protected Species

State-listed endangered and threatened species are protected under Minn. Stat. § 84.0895, administered by the MDNR. The Applicants submitted a formal MDNR MCE NHIS database request for the Project Study Area and associated Segments to the MDNR

on June 3, 2024, and received the results from MDNR on August 22, 2024. On September 24, 2024, the Applicants submitted a supplemental request from MDNR for the areas along the Route Options that were modified since the June 2024 submittal. The August 22, 2024 results of the MDNR NHIS database query identified 37 species with state designations potentially present within the Route Options. These species, and their state status and habitat, are identified in Table 7.4-21.

Table 7.4-21 State Threatened and Endangered Species Potentially Present Along Route Options

Common Name	Scientific Name	State Status[1]	Habitat[2]
Vascular Plants			
Ball Cactus	Coryphantha vivipara	END	In crevices of granite outcrops and in thin soil over granite bedrock.
Eared False Foxglove	Agalinis auriculata	END	Wet to mesic prairie environments. Primarily observed along railroad right of ways.
Hairy Waterclover	Marsilea vestita	END	Rooted in thin layers of sediment that accumulate over time on Sioux quartzite outcrops in prairie environments. Directly associated with ephemeral rainwater pools that receive direct sunlight.
Prairie Quillwort	Isoetes melanopoda	END	Rooted in thin layers of sediment that accumulate over time on Sioux quartzite outcrops in prairie environments. Can be submerged or emergent in ephemeral pools during early stages of development.
Wolf's Spikerush	Eleocharis wolfii	END	Rooted in thin layers of sediment on the margins of rainwater pools that accumulate on bedrock outcrops in prairie or savanna environments.
Hair-like Beak Rush	Rhynchospora capillacea	THR	Groundwater-maintained wetlands with a high pH, high levels of dissolved minerals, and low levels of dissolved oxygen (calcareous or spring fens). Grows on the margins of fen pools and marl flats where competition is minimal.
Larger Water Starwort	Callitriche heterophylla	THR	In southwest Minnesota, it occurs primarily in shallow rainwater pools on Sioux quartzite outcrops. In northeast Minnesota, it occurs primarily in the shallow margins of protected lakes and bays.
Short-pointed Umbrella Sedge	Cyperus acuminatus	THR	At the margins of shallow rock pools or prairie ponds. Roots in thin layers of organic sediment in sparsely vegetated areas.
Stream Parsnip	Berula erecta	THR	Roots in the margins of spring-fed streams and pools that have stable temperatures year-round. Typically found in full sun no more than a few meters away from the groundwater source.

Common Name	Scientific Name	State Status[1]	Habitat[2]
Waterhyssop	Bacopa rotundifolia	THR	Small rainwater pools on bedrock outcrops and occasionally along the margins of shallow prairie ponds in the Mississippi River Valley and other river valleys throughout Minnesota.
Cutleaf Ironplant	Xanthisma spinulosum var. spinulosum	SPC	Dry prairie habitats at south- and west-facing high points (knolls, slopes, ridges). Typically found in excessively well-drained sandy or gravel soils.
Dwarf Spikerush	Eleocharis coloradoensis	SPC	Seasonal muddy or silty lake shores in the prairie region of western Minnesota.
Few-flowered Spikerush	Eleocharis quinqueflora	SPC	Primarily occurs in sparsely vegetated wet habitats in mineral-rich soils. Can occur in wet openings or well-trampled animal trails in northern Minnesota.
Hill's Thistle	Cirsium pumilum var. hillii	SPC	Occurs in well-drained soils that produce drought-like conditions during periods of low rainfall, including southern dry prairies and savannas.
Missouri Milk-vetch	Astragalus missouriensis var. missouriensis	SPC	Primarily found in dry prairies on glacial till with dry sand-gravel soils. Typically found on upper parts of south- and west-facing slopes in areas where the soil is exposed or eroded.
Mudwort	Limosella aquatica	SPC	Wetland/semi-aquatic species that grows on the margins of shallow rainwater pools in lowland prairies and rock outcrops. Can tolerate both wet and dry conditions.
Oregon cliff fern	Woodsia oregana ssp. cathcartiana	SPC	Occurs in crevices of bedrock outcrops that are typically dry and shaded/partially shaded. Soil in the rock crevices is minimal and consists of wind-blown particles, coarse rock fragments, and remnant organic material.
Prairie Mimosa	Desmanthus illinoensis	SPC	Rarely found on mesic prairies, typically occurring on lakeshores located in what was historically the prairie region of Minnesota.
Sea Naiad	Najas marina	SPC	Limited to alkaline lakes located in shallow basins in calcareous glacial deposits with a mean total alkalinity of 246 ppm.
Slender Milk-vetch	Astragalus flexuosus var. flexuosus	SPC	Frequently found in dry to mesic prairies, most commonly in hill prairies. Midheight and shortgrass species are prominent in dry prairies, while tallgrasses dominate mesic prairies.
Small White Lady's-slipper	Cypripedium candidum	SPC	Occurs primarily in undisturbed deep-soil mesic prairies, but is also found in wet prairies, certain sedge meadows, and calcareous fens.
Spiral Ditchgrass	Ruppia cirrhosa	SPC	Submerged aquatic plant occurring in alkaline or "hardwater" lakes with a mean total alkalinity of 239 ppm and a mean pH of 8.7.

Common Name	Scientific Name	State Status[1]	Habitat[2]
Three-stamened Waterwort	Elatine triandra	SPC	Occurs in shallow waters with sandy substrates in northern Minnesota. Occurs in small rock pools that dry out in early June in southwestern Minnesota. Once dry, the plant persists for a short time until the substrate it rooted in desiccates.
Tumble Grass	Schedonnardus paniculatus	SPC	Occurs in southwestern Minnesota bedrock outcrops where wind-blown soil accumulates. May also colonize dry, disturbed soils.
Birds			
Loggerhead shrikes	Lanius ludovicianus	END	Grasslands that contain short grass and scattered perching sites such as hedgerows, shrubs, or small trees. They can be found in native prairie, pastures, shelterbelts, old fields or orchards, cemeteries, grassy roadsides, and farmyards.
Henslow's sparrow	Centronyx henslowii	END	Uncultivated and unmowed grasslands and old fields with standing, dead vegetation, and a substantial litter layer.
Burrowing owl	Athene cunicularia	END	Open, grazed pastures or native prairies populated by burrowing mammals.
American white pelican	Pelecanus erythrorhynchos	SPC	Large, shallow bodies of water that are rich in fish, in both treeless and forested areas.
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.
Short-eared owl	Asio flammeus	SPC	Open habitats such as native prairie, pasture, grasslands, marshes, and peatlands.
Mammals			
Richardson's ground squirrel	Spermophilus richardsonii	SPC	Open habit with dry well-drained soils for burrowing.
Big brown bat	Eptesicus fuscus	SPC	Winter roosts are located in caves and mines, though this species also regularly hibernates in buildings, cellars, and tunnels. Warm season roosts can consist of human structures such as buildings and bridges; trees that are hollow, have crevices, loose bark, or cavities are also used.
Amphibians			
Great Plains toad	Anaxyrus cognatus	SPC	Historically occurred in remnant prairies and open grasslands in Western Minnesota. Recently has been primarily observed in agricultural areas and in tiny remnant prairies and grasslands.
Butterfly			
Dakota skipper	Hesperia dacotae	END[3]	Remnant native prairie habitats.

Common Name	Scientific Name	State Status[1]	Habitat[2]
Mussels			
Elktoe	Alasmidonta marginata	THR	Medium to large rivers with sand and gravel substrates in areas with moderate to fast velocities.
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 in areas with sand, fine gravel, and/or mud.

[1]END = Endangered; THR = Threatened; SPC = Special Concern
[2]Habitat information obtained from the MDNR Rare Species Guide (MDNR, 2024n).
[3]The Dakota skipper is also federally listed as threatened (*see* **Section 7.4.12.1.4**)

7.4.12.3 Natural Resources Sites

Several lands that are preserved or managed for wildlife and associated habitat are present within the Project Study Area, including: MBS sites of biodiversity significance, MDNR Rare Natural Communities, MDNR Native Plant Communities (NPC), and conservation easements such as the CREP and RIM.

WMAs, WPAs, and National Wildlife Refuges crossed by the Route Options are detailed in **Section 7.2.10**. National Wildlife Refuges adjacent to the Route Options are also described in **Section 7.2.10**.

Lakes of Biological Significance are described in **Section 7.4.5**. Calcareous Fens are described in **Section 7.4.8**.

The Project does not cross any rusty patched bumble bee High Potential Zones, Lakes State Forest Management Bat Habitat Conservation Plan features, or MDNR Old Growth Stands.

7.4.12.3.1 Minnesota Biological Survey Sites

MBS Sites of Biodiversity Significance are areas with varying levels of native biodiversity that may contain high quality native plant communities, rare plants, rare animals, and/or animal aggregations. A biodiversity significance rank is assigned on the basis of the number of rare species, the quality of the native plant communities, size of the site, and context within the landscape. There are four biodiversity significance ranks: "outstanding", "high", "moderate", and "below". "Outstanding" sites contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most ecologically intact or functional landscapes. "High" sites contain good quality occurrences and "moderate" sites contain at least one occurrence and have high potential for recovery. Areas ranked as "Below" were found to

be disturbed and are retained in the layer as negative data. These areas do not meet the minimum biodiversity threshold for statewide significance but may have conservation value at the local level as habitat for native plants and animals, corridors for animal movements, buffers surrounding higher quality natural areas, or as areas with high potential for restoration of native habitat. Table 7.4-22 describes the MBS Sites crossed by the Route Options.

Table 7.4-22 Minnesota Biological Survey Sites Located Within 330 Feet of the Route Options

MBS Site Name	Biodiversity Significance Rank[1]
Akron 21	Below
AKRON WPA	Below
ARTICHOKE WPA	Below
Barsness WPA	Moderate
Ben Wade 24	Below
FAIRFIELD 15	Below
Forada WMA	Below
HAMANN WPA	High
HILLMAN WPA	High
HWY 12 PARK PRAIRIE	Below
Jorgenson WPA	Moderate
Lake Mary 15	Below
Lake Mary 20	Below
Lake Mary Woods	Moderate
Leven 3	Moderate
Leven 20/30	Below
Leven 31	Below
Little Chippewa River	Moderate
MAKI WPA	Moderate
MENZEL WPA	Below
MIDDLE STONY RUN SOUTH	Moderate
MOYER 9	Moderate
New Prairie 27	Below
New Prairie 35	Below
ODESSA 16	Moderate
ODESSA 21	Moderate
ODESSA 22 SE	Below
ODESSA 22	High
ODESSA 28	Moderate
Odessa 29	Moderate
ORTONVILLE 13	Below
ORTONVILLE 14	Below
Ortonville 21	Moderate
ORTONVILLE 22	High

MBS Site Name	Biodiversity Significance Rank[1]
Reno 31	Moderate
Reno 36	Moderate
SHIBLE 9	Moderate
SHIBLE 16	Below
Starbuck WPA	Moderate
STONY RUN	Moderate
Swift Co. WPA	Moderate
TARA 31	Moderate
Walden 3	Moderate
Walden 29	Below
Walden WPA	Below
White Bear Lake 17	Below

The Route Width of Route Option South 1 crosses a total of 34.2 acres of MBS Sites with a High biodiversity significance ranking (4.3 acres in ROW); 86.9 acres of MBS Sites with a Moderate biodiversity significance ranking (10.5 acres in ROW); 83.8 acres of MBS Sites ranked as Below (10.5 acres in ROW).

The Route Width of Route Option South 2 crosses a total of 136.8 acres of MBS Sites with a High biodiversity significance ranking (17.8 acres in ROW); 67.9 acres of MBS Sites with a Moderate biodiversity significance ranking (10.2 acres in ROW); 77.2 acres of MBS Sites ranked as Below (5.8 acres in ROW).

The Route Width of Connector Segment S16 only crosses a total of 30.5 acres of MBS Sites ranked as Below (4.9 acres in ROW).

The Route Width of Route Option Central 2 crosses a total of 48.1 acres of MBS Sites with a Moderate biodiversity significance ranking (2.4 acres in ROW); 13.9 acres of MBS Sites ranked as Below (2.0 acres in ROW).

The Route Width of Route Option North 1 crosses a total of 6.6 acres of MBS Sites with a Moderate biodiversity significance ranking (0.04 acre in ROW); 8.1 acres of MBS Sites ranked as Below (0.1 acre in ROW).

The Route Width of Route Option North 2 crosses a total of 36.6 acres of MBS Sites with a Moderate biodiversity significance ranking (7.2 acres in ROW); 46.6 acres of MBS Sites ranked as Below (7.5 acres in ROW).

The Route Width of Segment Alternative N9 only crosses 6.0 acres of MBS Sites ranked as Below (0.1 acre in ROW).

The Route Width of Segment Alternative N10 only crosses 25.1 acres of MBS Sites ranked as Below (2.5 acres in ROW).

The Route Widths of Connector Segment S17, Segment Alternative S18, Route Option Central 1, Connector Segment C11, and Segment Alternative N11 do not cross any MBS sites. None of the Route Widths of Route Options, Segment Alternatives, or Connector Segments cross MBS Sites with an Outstanding biodiversity significance ranking.

7.4.12.3.2 MDNR Native Plant Communities

A NPC is a group of native plants that interact with each other and with their environment in ways not greatly altered by modern human activity or by introduced organisms. These groups of native plant species form recognizable units, such as oak savannas, pine forests, or marshes, that tend to repeat over space and time. Data is provided in **Appendix C** on acreage of NPCs by Route Option.

Within the South Segment, Route Option South 1 crosses a total of 61.3 acres of MDNR NPCs and Route Option South 2 crosses a total of 89.2 acres of MDNR NPCs. Connector Segment S16, Connector Segment S17, and Segment Alternative S18 do not cross any MDNR NPCs.

Route Option Central 2 is the only Project component to cross any MDNR NPCs and crosses a total of 2.7 acres.

Within the North Segment, Route Option North 1 crosses a total 6.6 acres of MDNR NPCs and Route Option North 2 crosses a total of 35.5 acres of MDNR NPCs. Segment Alternative N9, N10, and N11 do not cross any MDNR NPCs.

During consultation with MDNR, no concerns were raised on native prairies near the Project.

7.4.12.3.3 Minnesota Prairie Conservation Plan

The Minnesota Prairie Conservation Plan is a 25 year strategy for accelerating prairie conservation in the state, identifies Core Areas, Corridors, and Corridor Complexes as areas to focus conservation efforts. Site designations include Core Areas, Corridors, and Corridor Complexes. Three Minnesota Prairie Conservation Plan sites were identified within 330 feet of the Route Width: Core Area Lac qui Parle, Corridor Alexandria Moraine, and Corridor Complex McIver WPA.

7.4.12.3.4 Important Bird Areas

Important Bird Areas (IBAs) are natural resource sites identified by the National Audubon Society, which the Applicants have corresponded with. IBAs provide essential habitat for one or more breeding, wintering, and/or migrating bird species. The IBA program is designed to be proactive, voluntary, participatory, science-based and works to

identify, monitor, and conserve the most essential habitats for birds (Walickzky et al., 2019). One IBA is located within one mile of the Route Options: Lac qui Parle – Big Stone IBA.

7.4.12.3.5 Conservation Easements

The Project Study Area crosses BWSR RIM Conservation Easements. RIM Conservation Easements are parcels of land acquired by the state of Minnesota and in cooperation with county Soil & Water Conservation Districts to "improve water quality by reducing soil erosion, and phosphorus and nitrogen loading, and improving wildlife habitat and flood attenuation on private lands" (BWSR 2019).

In their October 18, 2024, correspondence, Minnesota BWSR identified nine RIM easements within the Route Width of the Route Options totaling 95.2 acres. Of the 95.2 acres, approximately 3.8 acres fall within the ROW of Route Option South 1 and 0.1 acre fall within the ROW of Route Option South 2.[17] (*see* **Appendix D-4)**.

The proposed Route Options cross USFWS owned and managed lands (e.g., fee title, grassland easement, and wetland easement lands). Refer to **Appendix D-1, Appendix D-2,** and **Appendix D-3** for the locations of USFWS fee title lands, USFWS wetland and grassland easements, including WPAs, relative to the Route Width.

7.4.12.4 Impacts and Mitigation

The Applicants have planned routes and structure design to span waterways, basins, and wetlands wherever feasible at natural resource sites, and impacts will be minimized to the maximum extent practicable. In addition, the Applicants will access or obtain available USFWS and MDNR rare species databases prior to construction activities to determine locations where the routes and structures are near or adjacent to known locations of listed species. The Applicants will avoid impacts to federal- and state-listed species to the maximum extent practicable. If this is not feasible, a qualified surveyor will conduct an assessment to identify potential locations where federal- and/or state-listed species may occur. The Applicants will work with USFWS and MDNR to develop avoidance plans and species-specific mitigation measures, if applicable. Additional consultation with USFWS may be required for the Endangered Species Act listed species and critical habitat that may occur in the Project Area other than the northern long-eared bat (*see* **Section 7.4.12.1** and **Appendix F**).

Tree removal may be required near natural resource sites, such as where Route Option South 1 and South 2 cross the Minnesota River. Additionally, Route Option

[17] Addends may not sum due to rounding.

South 2 would likely require tree clearing within and adjacent to a MBS site at the river crossing. Permanent tree removal and continued maintenance of the Project ROW within forested areas may permanently change these areas to grassland habitat and therefore contribute to habitat fragmentation as forested areas are intersected. In MDNR's early coordination comment letter dated July 12, 2024 (*see* **Appendix F**), the MDNR recommended the Applicants avoid excess accumulation of mulch and wood chips greater than one inch in thickness throughout native vegetation areas and wetlands during route clearing. The Applicants will incorporate this MDNR recommendation wherever feasible and work with the MDNR to refine route and reduce impacts to natural resource sites.

The MDNR also recommended the Applicants implement a VMP for the Project to manage invasive species and provide pollinator habitat where feasible. The Applicants' draft VMP is provided in **Appendix J**.

The MDNR also recommended the Applicants identify areas of avian collision concerns and incorporate bird flight diverters along transmission lines. The Applicants will work with the MDNR to identify concern areas and where feasible, incorporate adequate spacing of conductors and grounding devices in accordance with APLIC standards to reduce the risk of electrocution to raptors.

As described in **Section 7.4.12.3.3**, MDNR identified potential impacts to native prairie remnants consistent with the Minnesota Prairie Conservation Plan. The Applicants will avoid all native prairie remnants to the extent practicable as recommended by MDNR and supported by the Minnesota Prairie Conservation Plan. If any native prairie remnants are crossed by the Project in the final design, the Applicants will coordinate with MDNR to develop a native prairie protection plan.

There are MBS sites and NPCs located within the Route Options and are associated with water basins, various NPCs, and waterways such as the Minnesota River. There are no MBS Sites of Biodiversity Significance ranked Outstanding within 330 feet of the Route Width, and only the Route Width of Route Options South 1 and South 2 cross four sites ranked as High (Hamann WPA, Hillman WPA, Odessa 22, and Ortonville 22). Where possible, the Applicants designed routes to avoid impacts to MBS Sites and NPCs. For sensitive areas that will be crossed, the Applicants will conduct rare species surveys and commit to spanning wetlands, water features, and natural resources to the maximum extent practicable.

Mitigation methods during construction may include seasonal restrictions, fencing of rare features, and vegetation restoration as applicable. Vegetation removed during construction outside of the Project ROW will be allowed to revegetate naturally and in

accordance with the final VMP. The Applicants will continue to work with the MDNR to refine the Route Options and reduce impacts to MBS Sites and NPCs.

There are nine RIM easements within the Route Width of the Route Options totaling 95.2 acres. Of the 95.2 acres, approximately 3.8 acres fall within the ROW of Route Option South 1 and 0.1 acre fall within the ROW of Route Option South 2.[18]

(*see also* **Appendix D-4**). Depending on the route selected, the Applicants will limit construction workspaces near Minnesota BWSR conservation easements to avoid direct impacts. The Applicants will continue to coordinate with Minnesota BWSR to reduce impacts (e.g., spanning, structure placement) or avoid impacts to CREP and RIM lands.

The Applicants have consulted with USFWS regarding potential Project impacts on USFWS owned and managed lands (e.g., fee title, grassland easement, and wetland easement lands). The proposed Route Options have been routed to avoid, where feasible, USFWS owned and managed lands (*see* Table 3.2-1). The Applicants will continue to work with the USFWS to refine the Route Options and reduce impacts to USFWS owned and managed lands and acquire applicable permits (e.g., USFWS ROW permit and/or Special Use permits) depending on the route selected.

7.5 Archeological and Historic Resources

A cultural resource desktop literature review was conducted between December 2023 and August 2024 using inventory files from the SHPO and OSA online portals. The research identified previously recorded precontact archaeological sites, architecture/historical properties, and unrecorded historic cemeteries within the Route Options as discussed in **Section 7.5.1**. In August 2024, the data collected from the desktop literature review were further analyzed by the Applicants based on the ROW for the Route Options. A stand-alone cultural resource literature review report was not completed at the time of filing this Application.

The three Segments are within the Prairie Lakes Archaeological Region (Region 2) and the Central Lakes Deciduous Region (Region 4), which cover the areas of southwestern and central Minnesota. All Route Options cross the Prairie Lakes Archaeological Region, which includes Big Stone, Stevens, and Swift counties, and portions of Douglas and Pope Counties. Route Options North 1 and North 2 also cross the Central Lakes Deciduous Region, which includes portions of Douglas and Pope counties (Gibbon et. al 2002).

[18] Addends may not sum due to rounding.

Archaeologically, all periods of cultural occupation are found within the Prairie Lakes Archaeological Region. Early period (ca. 9500-6000 BC) archaeological sites consist of the remains of fluted (Clovis, Folson) and Plano (Browns Valley, Agate Basin, Hell Gap) project points. Archaeological resources dating between 6000-3000 BC are relatively limited, possibly due to the depth of burial in colluvium or alluvium, and many may be underwater due to the increased land masses during the last glaciation. Inhabitants during this time hunted bison across the landscape, especially around riverine and lake environments. Many of these earlier period archaeological sites that have been identified are found on islands and peninsulas along the lakes. A similar settlement pattern was reached in the Woodland period (ca. 3000 BC – A.D. 1650). Agricultural village sites of this time are found predominantly on intermediate terraces of the Minnesota and Blue Earth rivers. Contact period sites are primarily associated with the Yankton Dakota and Sisseton Dakota (Dakota), and French, English, and American wintering posts. Dakota villages were predominantly located along areas of the Minnesota River. Wintering posts were concentrated along the upper areas of the Minnesota River between 1750-1800 but became established along surrounding interior forested locations during the early 1800s (Gibbon et. al 2002).

The Central Lakes Deciduous Region has a rich archaeological history as well. Early period archaeological sites consist of a concentration of fluted points found on Howard Lake and Plano points found throughout the region. Archaic period sites are found along the edges of lakes and major rivers and include the Petaga Point site at Lake Mille Lac- Rum River juncture and the Pine City sites along the Snake River. By A.D. 500, subsistence strategies changes and larger settlements developed in addition to the harvesting of wild rice. Larger village sites became concentrated on lakeshores or near stream inlets/outlets in relation to wild rice beds. Contact period sites are primarily associated with the French fur trade posts of the late 1600s and post-construction sites after the establishment of Fort Snelling in 1821 (Gibbon et. al 2002).

7.5.1 Previously Recorded Cultural Resources

An analysis of previously recorded cultural resources located along the Route Options, Segment Alternatives, and Connector Segments is presented below. The unrecorded historic cemetery locations can often only be ascertained to the section or quarter section of the Public Land Survey System (PLSS) level, and therefore may compose an area larger than the actual resource. The OSA portal provides an approximate location of the unrecorded historic cemeteries based on the PLSS research presented in An Investigation of Unrecorded Historical Cemeteries in Minnesota (Vameer and Terrel

2011). Table 7.5-1 provides a summary of previously recorded cultural resources and unrecorded historic cemeteries between the Route Options.

Table 7.5-1 Known Cultural Resources Within the Route Options

Route Option	Archaeological Resources Within Route Width / ROW	Architectural Resources Within Route Width / ROW	Unrecorded Historic Cemeteries Within Route Width / ROW
Route Option South 1	3/2	7/6	1/1
Route Option South 2	2/1	14/6	1/1
Segment Alternative S18	0/0	0/0	0/0
Connector Segment S16	0/0	0/0	0/0
Connector Segment S17	0/0	0/0	0/0
Route Option Central 1	0/0	5/5	0/0
Route Option Central 2	1/0	3/2	0/0
Segment Connector C11	0/0	0/0	0/0
Route Option North 1	1/1	4/4	2/2
Route Option North 2	1/1	4/4	1/1
Segment Alternative N9	0/0	3/3	0/0
Segment Alternative N10	4/4	0/0	0/0
Segment Alternative N11	0/0	4/0	0/0

7.5.1.1 South Segment Previously Recorded Cultural Resources

The known archaeological, historic structures, and unrecorded cemeteries within the Route Option and ROW for the South Segment are described below.

7.5.1.1.1 Route Option South 1

Within Route Option South 1 there are three archaeological sites, seven architectural sites, and one unrecorded historic cemetery that overlap the Route Option (Table 7.5-2). Of all the previously recorded cultural resources within Route Option South 1, two archaeological sites, six architectural sites and one unrecorded historic cemetery overlap the ROW. The archaeological sites are unevaluated for NRHP eligibility, one architectural site is unevaluated for NRHP eligibility, one architectural is eligible for inclusion in the NRHP (XX-RRD-CSP012) and four architectural sites are not eligible for inclusion in the NRHP. The unrecorded historic cemetery has not been evaluated for NRHP eligibility.

Table 7.5-2 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Route Option South 1

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Archaeological Resources				
21SW0013	Roadside Park	Precontact: Archaic Period Artifact Scatter	Unevaluated	Yes
21BS0008	Ortonville 2	Precontact Burial Mound	Unevaluated	Yes
21BS0009	Ortonville I	Precontact Burial Mound	Unevaluated	No
Architectural Resources				
XX-ROD-00168	Trunk Highway 59	Highway	Not Eligible	Yes
XX-ROD-00111	Trunk Highway 12	Highway	Not Eligible	No
XX-RRD-CSP010	Chicago Milwaukee and St. Paul Railway Company/Chicago Milwaukee St. Paul and Pacific Railroad Company: Hastings and Dakota Division Main Line	Railroad	Eligible	Yes
XX-ROD-00151	Trunk Highway 7	Highway	Not Eligible	Yes
XX-RRDCSP-012	Hastings and Dakota Railway Company: Main Line Extension	Railroad	Unevaluated	Yes
XX-ROD-00020	Trunk Highway/U.S. Highway 75 (formerly Trunk Highway 6)	Highway	Not Eligible	Yes
XX-RRD-CSP039	Fargo and Southern Railway Company/Chicago Milwaukee and St. Paul Railway Company/Chicago Milwaukee St. Paul and Pacific Railroad Company	Railroad	Not Eligible	Yes
Unrecorded Historic Cemeteries				
19406	Unknown	Unrecorded Cemetery	N/A	Yes

7.5.1.1.2 Route Option South 2

Within Route Option South 2 there are two archaeological sites, 14 architectural sites, and one unrecorded historic cemetery that overlap the Route Option (Table 7.5-3). Of all the previously recorded cultural resources within Route Option South 2, one archaeological site, six architectural sites and one unrecorded historic cemetery overlap the ROW. The archaeological sites are unevaluated for NRHP eligibility, one architectural site is unevaluated for NRHP eligibility, one architectural is eligible for inclusion in the NRHP (XX-RRD-CSP010) and 12 architectural sites are not eligible for inclusion in the NRHP. The unrecorded historic cemetery has not been evaluated for NRHP eligibility.

Table 7.5-3 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Route Option South 2

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Archaeological Resources				
21SW0049	Minnesota Farms	Precontact Artifact Scatter	Unevaluated	No
21BSf	A. Rodengen	Precontact Artifact Scatter	Unevaluated	Yes
Architectural Resources				
BS-ODS-00002	Immanuel Lutheran Church	Building	Not Eligible	No
SW-HEG-00001	Drywood Lutheran Church	Building	Not Eligible	No
SW-HEG-00002	James McGuire Farmstead	Building	Not Eligible	Yes
SW-HEG-00003	St Agnes Church	Building	Not Eligible	No
SW-FAI-00002	Fairfield Store	Building	Not Eligible	No
SW-FAI-00010	Bridge 89463	Bridge	Not Eligible	No
SW-FAI-00013	Bridge 76518	Bridge	Not Eligible	No
SW-FAI-00003	Fairfield Town Hall	Building	Not Eligible	No
XX-ROD-00168	Trunk Highway 59	Highway	Not Eligible	Yes
XX-ROD-00111	Trunk Highway 12	Highway	Not Eligible	No
XX-RRD-CSP010	Chicago Milwaukee and St. Paul Railway Company/Chicago Milwaukee St. Paul and Pacific Railroad Company: Hastings and Dakota Division Main Line	Railroad	Eligible	Yes
XX-ROD-00151	Trunk Highway 7	Highway	Not Eligible	Yes
XX-RRDCSP-012	Hastings and Dakota Railway Company: Main Line Extension	Railroad	Unevaluated	Yes
XX-ROD-00020	Trunk Highway/U.S. Highway 75 (formerly Trunk Highway 6)	Highway	Not Eligible	Yes
Unrecorded Historic Cemeteries				
19406	Unknown	Unrecorded Cemetery	N/A	Yes

Route Option South 2 includes Segment Alternative S18, which is provided as an alternative to Subsegment S14. Within Segment Alternative S18, there are no archaeological resources, architectural resources, or unrecorded historic cemeteries that overlap the Route Option or the ROW.

7.5.1.1.3 Connector Segment S16

There are no known archaeological or architectural resources, or unrecorded historic cemeteries, within the Route Option or ROW of Segment Connector S16.

7.5.1.1.4 Connector Segment S17

There are no known archaeological or architectural resources, or unrecorded historic cemeteries, within the Route Option or ROW of Segment Connector S17.

7.5.1.2 Central 1 Route Option Previously Recorded Cultural Resources

The known archaeological, historic structures, and unrecorded cemeteries within the Route Option and ROW for the Central Segment are described below.

7.5.1.2.1 Route Option Central 1

Within Route Option Central 1 there are five architectural sites that overlap the Route Option (Table 7.5-4). There are no previously recorded archaeological sites or unrecorded historic cemeteries within Route Option Central 1. All five architectural sites overlap with the ROW for Route Option Central 1. One architectural site is eligible for inclusion in the NRHP (SE-XXX-00002) and four architectural sites are not eligible for inclusion in the NRHP.

Table 7.5-4 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Route Option Central 1

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Architectural Resources				
XX-ROD-00171	Trunk Highway 28	Highway	Not Eligible	Yes
PO-NPR-00009	Culvert 97586	Culvert	Not Eligible	Yes
SE-XXX-00001	Former Truck Highway 10 (Trunk Highway 12)	Highway	Not Eligible	Yes
SE-XXX-00002	Bypass, former Trunk Highway 10 (Trunk Highway 12)	Highway	Eligible	Yes
XX-ROD-00053	Trunk Highway 9	Highway	Not Eligible	Yes

7.5.1.2.2 Route Option Central 2

Within Route Option Central 2, there is one archaeological site, and three previously recorded architectural sites that overlap the Route Option (Table 7.5-5). There are no unrecorded historic cemeteries within the Route Option Central 2. Of these, two architectural sites overlap the Central 2 ROW. The archaeological site is unevaluated for

NRHP eligibility, one architectural site is unevaluated for NRHP eligibility and two architectural sites are not eligible for inclusion in the NRHP.

Table 7.5-5 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Route Option Central 2

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Archaeological Resources				
21PO0070	Hovendick Site, Wadsworth Trail	Multicomponent, Precontact Habitation, Postcontact Trail	Unevaluated	No
Architectural Resources				
XX-ROD-00171	Trunk Highway 28	Highway	Not Eligible	Yes
XX-ROD-00053	Trunk Highway 9	Highway	Not Eligible	Yes
SW-TAR-00001	Tara Township Hall	Building	Unevaluated	No

7.5.1.2.3 Connector Segment C11

There are no known archaeological or architectural resources, or unrecorded historic cemeteries, within the Route Option or ROW of Segment Connector C11.

7.5.1.3 North Segment Previously Recorded Cultural Resources

The known archaeological, historic structures, and unrecorded cemeteries within the Route Option and ROW for the North Segment are described below.

7.5.1.3.1 Route Option North 1

Within Route Option North 1, there are one archaeological site, four architectural sites, and two unrecorded historic cemeteries that overlap the Route Option (Table 7.5-6). Of all the previously recorded cultural resources within Route Option North 1, one archaeological site, four architectural sites and two unrecorded historic cemeteries overlap the ROW for Route Option North 1. The archaeological site is unevaluated for inclusion in the NRHP, two of the architectural sites within the ROW for Route Option North 1 are unevaluated for NRHP eligibility and the other two architectural sites within the ROW for Route Option North 1 are not eligible for inclusion in the NRHP. The unrecorded historic cemeteries have not been evaluated for NRHP eligibility.

Table 7.5-6 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Route Option North 1

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Archaeological Resources				
21DLf	Alexandria	Habitation	Unevaluated	Yes
Architectural Resources				
DL-LAK-00001	Lake Mary Town Hall	Building	Unevaluated	Yes
XX-RRD-SOO002	Minneapolis & Pacific Railway Company/Minneapolis, St. Paul & Sault Ste. Marie Railroad: Mainline	Railroad	Unevaluated	Yes
XX-ROD-00043	Trunk Highway 55	Highway	Not Eligible	Yes
XX-ROD-00100	Trunk Highway 114	Highway	Not Eligible	Yes
Unrecorded Historic Cemeteries				
20368	Johnny Thoen Farm Burial Site	Unrecorded Cemetery	N/A	Yes
20365	Sunset Memorial Cemetery	Unrecorded Cemetery	N/A	Yes

Route Option North 1 includes Segment Alternative N9, which is provided as an alternative to Subsegment N2. It also includes Segment Alternative N10, which is provided as an alternative to Subsegment N4. Within Segment Alternative N9, no archaeological resources or unrecorded historic cemeteries overlap the Route Option or the ROW. Within the Alternative N9 ROW, there are three architectural resources (Table 7.5-7). One of the architectural resources is unevaluated for NRHP eligibility and two are not eligible for inclusion in the NRHP within the Alternative N9 ROW. In comparison, the same three architectural resources that overlap Route Option North 1 Alternative N9 also overlap Route Option North 1 Subsegment N2.

Table 7.5-7 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Segment Alternative N9

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Architectural Resources				
XX-RRD-SOO002	Minneapolis & Pacific Railway Company/Minneapolis, St. Paul & Sault Ste. Marie Railroad: Mainline	Railroad	Unevaluated	Yes
XX-ROD-00043	Trunk Highway 55	Highway	Not Eligible	Yes
XX-ROD-00100	Trunk Highway 114	Highway	Not Eligible	Yes

Within Segment Alternative N10, no architectural resources or unrecorded historic cemeteries overlap the Route Option or the ROW. Within the Alternative N10 ROW, there are four archaeological resources (Table 7.5-8). All four archeological

resources are unevaluated for NRHP eligibility. In comparison, there are no archaeological resources that overlap Route Option North 1 Subsegment N4; however, there is one previously recorded architectural resource (DL-LAK-00001) that overlaps Subsegment N4.

Table 7.5-8 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Segment Alternative N10

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Archaeological Resources				
21DL0119	Major's Creek Crossing	Precontact: Woodland Period Artifact Scatter	Unevaluated	Yes
21DL0120	Lake Andrew I	Precontact Isolated Find	Unevaluated	Yes
21DL0121	Lake Andrew II	Precontact: Woodland Period Artifact Scatter	Unevaluated	Yes
21DL0123	Mud Lake Overlook	Precontact Artifact Scatter	Unevaluated	Yes

7.5.1.3.2 Route Option North 2

Within Route Option North 2, there is one archaeological site, four architectural sites, and one unrecorded historic cemetery (Table 7.5-9). All of the previously recorded cultural resources overlap with the ROW of Route Option North 2. The archaeological site is unevaluated for NRHP eligibility, one architectural site is unevaluated for NRHP eligibility, and three architectural sites are not eligible for inclusion in the NRHP. The unrecorded historic cemetery has not been evaluated for NRHP eligibility.

Table 7.5-9 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Route Option North 2

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Archaeological Resources				
21DLf	Alexandria	Habitation	Unevaluated	Yes
Architectural Resources				
XX-ROD-00100	Trunk Highway 114	Highway	Not Eligible	Yes
XX-RRD-SOO002	Minneapolis & Pacific Railway Company/Minneapolis, St. Paul & Sault Ste. Marie Railroad: Mainline	Railroad	Unevaluated	Yes
XX-ROD-00043	Trunk Highway 55	Highway	Not Eligible	Yes
XX-ROD-00060	Trunk Highway 29	Highway	Not Eligible	Yes
Unrecorded Historic Cemeteries				
20365	Sunset Memorial Cemetery	Unrecorded Cemetery	N/A	Yes

Route Option North 2 includes Segment Alternative N11, which is provided as an alternative to Subsegment N7. Within Segment Alternative N11, no archaeological resources or unrecorded historic cemeteries overlap the Route Option or the ROW. Within the Alternative N11 Route Option, there are four architectural resources (Table 7.5-10). Two of the architectural resources are unevaluated for NRHP eligibility and two are not eligible for inclusion in the NRHP. In comparison, there are no previously recorded archaeological resources, architectural resources, or unrecorded historic cemeteries within Route Option North 2 Subsegment N7.

Table 7.5-10 Archaeological, Architectural, and Unrecorded Historic Cemeteries Within Segment Alternative N11

Site / Inventory Number or Cemetery ID	Name	Resource Type	NRHP Status	Within ROW
Architectural Resources				
XX-ROD-00180	Trunk Highway 27	Highway	Not Eligible	No
XX-ROD-00185	US Trunk Highway 52	Highway	Not Eligible	No
DL-HUD-00005	Bridge 21815	Bridge	Unevaluated	No
DL-HUD-00006	Bridge 21816	Bridge	Unevaluated	No

7.5.1.4 Impacts and Mitigation

Cultural resources within the Route Options may be subject to direct and/or indirect impacts. Direct impacts could result from ground disturbance associated with the construction and maintenance of the Project, including transmission structures, access roads, and pulling/tensioning areas. Indirect effects could result from activities that occur near, but not physically affecting cultural resources. Indirect visual impacts, for example, may occur to some types of NRHP-eligible cultural resources when modern structures (e.g., transmission structures) are introduced into the viewsheds of these resources. The Route Options have generally been sited to avoid direct impacts to documented NRHP-eligible or unevaluated cultural resources and unrecorded historic cemeteries. However, eight unevaluated archaeological sites, two NRHP-eligible (one railroad and one highway) and three unevaluated architectural properties, and three unrecorded cemeteries are within the proposed ROWs of the Project.

The Project has the potential to affect undocumented cultural resources within the existing ROW. Effects to resources include permanent damage to sites from earth disturbing work, including excavating of temporary work surfaces and drilling of structure foundations. The Applicants will consult with the SHPO and Tribal Historic Preservation Offices (THPOs) before construction to assess the potential to affect

currently undocumented resources and if necessary, conduct cultural resources surveys to minimize or avoid adverse impacts to significant cultural resources.

During Project construction, previously undocumented cultural resources including lithic materials, artifact scatters, habitation sites, Native American mounds and earthworks, other archaeological resources, Tribal resources, and human remains could be discovered. Therefore, to avoid impacts to unknown cultural resources, the Applicants will develop an Unanticipated Discovery Plan. The Unanticipated Discovery Plan will set guidelines that will be used if archaeological resources or human remains are discovered during Project construction including an immediate stop work order and a roped buffer placed around the unanticipated discovery to prevent construction crews from further work. The plan will describe protocols and mitigation measures for unanticipated discoveries and will provide relevant contact information for law enforcement, qualified SHPO officials, THPO officials, environmental inspectors, archaeologists, and county sheriffs.

7.6 Unavoidable Impacts

Environmental information required for a Route Permit Application pursuant to Minn. R. 7850.1900, subp. 3(G) includes a description of the human and natural environmental effects that cannot be avoided if the Project is approved by the Commission. The Applicants have developed the Project to avoid impacts to environmental resources whenever possible. In some cases, impacts to environmental resources cannot be entirely avoided, but could be minimized by implementation of mitigation measures. A detailed discussion of the environmental impacts of the Project, as well as the mitigation measures that would be used to minimize impacts is presented in **Sections 7.1** through **7.5** of this Application. Environmental impacts that would be minimized by the use of mitigation measures, but not entirely avoided, are provided below. Most of these unavoidable impacts would occur during construction of the Project and would resolve with the completion of construction.

Unavoidable impacts related to the Project that would last only as long as the construction period include:

- Conversion of land use and land cover (i.e., agricultural land and forest).
- Construction-related noise.
- Visual impacts from construction activities.
- Construction-related traffic.

- Disturbance to hunters, anglers, wildlife observers, and other users of recreational areas.
- Loss of agricultural production.
- Emissions of criteria pollutants and GHGs from construction equipment.
- Wetland impacts (to be confirmed after wetland delineation).
- Soil compaction and erosion.
- Vegetation clearing.
- Wildlife displacement and habitat loss.

Unavoidable impacts related to the Project that would last as long as the life of the Project would include the following:

- Conversion of land use and land cover (i.e., agricultural land).
- Visual impacts.
- Interference with AM radio signals.
- Emissions of criteria pollutants and GHGs during operation and maintenance activities.
- Potential loss of prime farmland at structure locations.
- Potential wetland impacts (to be confirmed after wetland delineation).
- Potential impacts to rare and unique resources such as MBS sites of biodiversity significance, MDNR Rare Natural Communities, MDNR NPCs, WMAs, WPAs, Lakes of Biological Significance, calcareous fens, and conservation easements such as the CREP and RIM. Removal of tall growing vegetation, including trees, during maintenance.
- Conversion of forested areas in maintained ROW.
- Injury or death of birds that collide with or are electrocuted by conductors.
- Potential displacement of residences or other buildings that cannot be avoided in a portion of Route Option South 1 (i.e., Subsegment S2) depending on the final alignment.

The Project will require only minimal commitments of resources that are irreversible and irretrievable. Irreversible commitments of resources are those that result from the use or destruction of a specific resource that cannot be replaced within a

reasonable timeframe. Irretrievable resource commitments are those that result from the loss in value of a resource that cannot be restored after the action. For the Project, those commitments that do exist are primarily related to construction. Construction resources will include aggregate resources, concrete, steel, and hydrocarbon fuel. During construction, vehicles necessary for these activities will need to travel to and from the construction area, consuming hydrocarbon fuels. Live trees cleared during construction also will be irretrievable. Other resources will be used in structure construction, structure placement, and other construction activities.

7.7 Cumulative Effects

A cumulative effect is the effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions, regardless of the agency or party undertaking such other actions (Council on Environmental Quality 1997). Cumulative effects can result from individually minor but collectively significant actions taking place over time, including transmission line development and other land and water development activities. Minn. R. 4410.0200, subp. 11a, defines cumulative potential effects, in part, as the "effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects…regardless of what person undertakes the other projects or what jurisdictions have authority over the project."

The cumulative effects analysis considered the potential effects of other actions as described in relevant public documents. The scope of the cumulative effects analysis from included consideration of local government units and depends in part on the availability of comprehensive land use plans and information about other projects. For this assessment, other projects were identified from information publicly available from city offices of Ortonville, Hancock, Glenwood, and Alexandria, county offices of Big Stone, Swift, Stevens, Pope, and Douglas counties in Minnesota; MnDOT; MISO; MPUC; FERC; and regional newspapers, including West Central Tribune, Alexandria Echo Press, and Stevens County Times.

7.7.1 Geographic Scope

The geographic scope of this analysis for this application consisted of the counties crossed by the Project: Big Stone, Swift, Stevens, Pope, and Douglas counties in Minnesota. Other projects' effects, when combined with those of this Project, could result in a cumulative effect. Projects located outside of the geographic scope were not evaluated

because their potential to contribute to a cumulative effect diminishes with increasing distance from the Project, thus are outside the environmentally relevant area.

7.7.2 Reasonably Foreseeable Future Actions

In general, "reasonably foreseeable" future projects are proposed projects or developments that have applied for a permit from a local, state, or federal authority, or planned projects that have been publicly announced, such as in comprehensive plans. Other foreseeable future actions may also be identified by agencies or based on known trends, such as population changes. Projects must also have sufficiently detailed information available to contribute to the understanding of cumulative potential effects to be considered in the analysis.

Reasonably foreseeable future actions within the geographic scope of the Project are listed in Table 7.7-1 and described below.

Table 7.7-1 Reasonably Foreseeable Future Actions

Plans, Programs, or Project	County[1]	Description	Type
I-94 Overlay & Bridge Improvement Project ***Construction***	Douglas	The MnDOT's I-94 Overlay & Bridge Improvement project in Douglas County, Minnesota, will resurface 12.75 miles of westbound I-94 from Alexandria to the Douglas/Todd County line near Osakis. It includes guardrail upgrades and rehabilitating seven bridges, with four being fully replaced (eastbound and westbound bridges over the CP Railway and County Road 23). New edge drains will also be installed. The project will occur in two phases: April-November 2024 and April-August 2025.	Road and Bridge Construction
Local Highway (Hwy) 29-Alexandria ***In feasibility study phase***	Douglas	The MnDOT's Hwy 29-Alexandria Project in Douglas County, Minnesota, aims to improve the corridor with updated intersections, access management, and pedestrian accessibility. Currently in the feasibility study phase, it seeks to develop a vision for future enhancements to better serve local and regional traffic, including cars, bikes, and pedestrians. This study will guide subsequent construction efforts anticipated in the near future (2025 assumption).	Road Construction

Plans, Programs, or Project	County[1]	Description	Type
Hwy-104 Glenwood to Hwy-9 ***Construction anticipated Summer 2025***	Pope	The MnDOT's Hwy-104 Glenwood to Hwy-9 Project in Pope County, Minnesota, involves resurfacing Hwy-104 from 6th Ave SE in Glenwood to the west junction of Hwy-9 using mill and overlay techniques. Construction is scheduled for summer 2025.	Road Construction
CSAH 13 between US12 and CSAH 22 ***Construction anticipated 2027***	Swift	Roadway resurfacing using mill and overlay techniques for 7.0 miles of CSAH 13 between US 12 and CSAH 22 is scheduled for 2027.	Road Construction
CSAH 8 between US 59 and CSAH 1 ***Construction anticipated 2028***	Stevens	A roadway resurfacing project using bit, mill, and overlay is planned for 2028 along CSAH 8 between US 59 and CSAH 1.	Road Construction
Alexandria to Big Oaks 345 kV Transmission Project ***In permitting***	Douglas, Todd, Stearns, Sherburne, and Wright	Construction of an approximately 108-mile long, 345 kV transmission line on existing double-circuit capable structures. Extends 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. Associated facilities include expansion of three existing substations and construction of one new substation.	Transmission Line
Appleton-Benson 115 kV Transmission Line ***In permitting***	Swift	Construction of approximately 28 miles of 115 kV transmission line and associated facilities from the MRES Appleton substation to Great River Energy Benson substation. Construction anticipated in 2028-2030.	Transmission Line

[1]A plan, program, or project located in a county that overlaps with this Project. This does not include all counties the plan, program, or project is within.

Sources: Minnesota Department of Transportation (MnDOT) 2024d, MnDOT 2024e MnDOT 2024f, MnDOT 2024g, Swift County 2023, Stevens County 2024, and Minnesota Department of Commerce 2024.

7.7.3 Resource Effects

The surrounding environment already includes various modifications such as residential homes, urban areas, transmission lines, highways, county roads, railroads, substations, and other industrial and commercial structures. By paralleling existing infrastructure as much as possible, the Project minimizes the potential for cumulative effects by minimizing the creation of new transmission corridors, habitat fragmentation, and the overall potential for resource effects. Table 7.7-2 summarizes the length of each Route Option that parallels existing linear infrastructure.

Table 7.7-2 Existing Linear Infrastructure Parallelling each Route Option

	Route Options					
	South 1	South 2	Central 1	Central 2	North 1	North 2
Parallelling Existing Transmission (miles)	3.2	8.6	1.5	0.8	0.0	1.3
Parallelling Existing Roads and Railroads (miles)	13.9	20.4	20.9	20.1	5.0	**4.1**
Following Property Lines (miles)	20.5	8.0	11.5	15.0	11.0	**17.5**
Total Linear Feature Sharing (miles)	**37.6**	**37.0**	**33.9**	**35.9**	**16.0**	**22.9**
Total Linear Feature Sharing (percent)	**89.7**	**95.3**	**98.5**	**93.1**	**88.0**	**91.0**

The projects listed in Table 7.7-1 would be anticipated to affect similar resources. During construction, the MnDOT road projects, the Alexandria to Big Oaks transmission line project, the Appleton-Benson transmission line project, and the proposed Project would all have the following impacts:

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

The Project and the other projects listed in Table 7.7-1 would follow federal, state, and local regulations and minimize environmental impacts to the extent practical. The impacts during construction of any of the individual projects would not be significant. The Project would minimize impacts to these resources during construction as described in the sections above and is not anticipated to have cumulative impacts on human or natural resources within the geographic scope.

During operation, the MnDOT road projects would not be expected to contribute ongoing impacts. The Alexandria to Big Oaks transmission line, Appleton-Benson transmission line project, and the proposed Project would have the following impacts during operation:

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

The Project would minimize impacts to these resources during operation as described in the sections above and is not anticipated to have cumulative impacts on human or natural resources within the geographic scope.

8.0 AGENCY, TRIBAL, LOCAL GOVERNMENT, AND PUBLIC OUTREACH

This section describes outreach efforts conducted by the Applicants and discusses pre-application involvement by Tribal, federal, state, and local agencies, and the Applicants' public information outreach efforts.

Throughout the outreach processes, the Applicants provided opportunities for stakeholders, including potentially affected landowners, to participate in the routing process. This engagement provided the Applicants with valuable insight into landowner, public agency, and Tribal preferences regarding development of Project facilities, including the development of route alternatives analyzed for the Project.

8.1 Agency and Tribal Involvement Pre-Application

The Applicants initiated an outreach campaign to federal, state, and local public agencies and Tribal contacts through Project notification letters. In these letters, the Applicants introduced the Project, requested input and comments on potentially-affected resources, and provided notice of open houses. As needed, the Applicants either met with, or continued corresponding with, stakeholders who responded to the outreach letters and associated Project information. Correspondence of outreach efforts are included in **Appendix F** and are summarized below.

The Project introduction letters included a Project overview map showing preliminary routing corridors and requested input and comment on public and natural resources that may be potentially affected by the Project. In the letter, the Applicants provided preliminary Project details and a potential timeline for major Project milestones. The Applicants also requested input from federal and state agencies with respect to the resources under their jurisdiction as well as the identification of federal and state permits and/or approvals that may be potentially required for the Project.

8.1.1 Federal Agencies

The Applicants sent initial outreach letters in November 2023 to the federal agencies listed in Table 8.1-1 below. As needed, the Applicants have completed follow up correspondence with the FAA, USDA, and USFWS regarding the Project. See **Appendix F** for records of key correspondence with applicable agencies.

Table 8.1-1 Federal Agency Outreach

Agency	Date of Initial Outreach Letter and Correspondence
Federal Aviation Administration	November 10, 2023; December 18, 2023; December 21, 2023
Federal Highway Administration	November 10, 2023
U.S. Army Corps of Engineers	November 10, 2023; September 12, 2024
U.S. Bureau of Indian Affairs	November 10, 2023
U.S. Department of Agriculture – Farm Service Agency	November 10, 2023; June 11, 2024; June 12, 2024; June 14, 2024
U.S. Fish and Wildlife Service	October 13, 2023; October 26, 2023; November 10, 2023; January 23, 2024 (meeting); February 13, 2024; April 23, 2024; April 26, 2024; April 29, 2024; May 23, 2024; May 29, 2024; June 4, 2024; June 27, 2024 (meeting); June 27, 2024; June 28, 2024; July 31, 2024; August 20, 2024; August 21, 2024; August 22, 2024; August 27, 2024; August 27, 2024; August 28, 2024
U.S. Environmental Protection Agency	November 10, 2023

8.1.1.1 Federal Aviation Administration

The FAA responded to the Project notification on December 18, 2023, and noted seven airports in the vicinity of the Project: Alexandria (AXN), Glenwood (GHW), Starbuck (D12), Benson (BBB), Appleton (AQP), Ortonville (VVV), and Morris (MOX). The FAA also directed the Applicants to the FAA Obstruction Evaluation/Airport Airspace Analysis webpage for FAA notification criteria. The Applicants will continue to consult with FAA as needed for the Project.

8.1.1.2 U.S. Army Corps of Engineers

The Applicants initiated discussions with USACE on September 13, 2024 regarding potential USACE permitting requirements. The Applicants will continue to consult with USACE in the future as more information is known about the route for the Project.

8.1.1.3 U.S. Department of Agriculture

Subsequent to the initial outreach, the Applicants followed up with USDA FSA on June 11, 2024, to determine if the Project overlapped with CRP contract parcels. On June 12, 2024, FSA confirmed they were reviewing the Project and noted that they may be able to provide a list of CRP payment recipients for the counties impacted by the Project. The specific information on the location of the CRP contract parcels could not be released without consent from the contract holder(s). On June 14, 2024, FSA provided the number of CRP contract parcels per county crossed by the Project. The Applicants will continue to consult with USDA as needed for the Project.

8.1.1.4 U.S. Fish and Wildlife Service

On October 13, 2023, USFWS provided a record of the no effect determination on the northern long-eared bat for the Project based on information gathered using the USFWS IPaC. The Applicants initiated consultation with USFWS on October 26, 2023. Along with the initial Project letter, the Applicants provided a copy of the IPaC report for the Project Study Area to USFWS in November 2023. On January 23, 2024, the Applicants met with USFWS representatives from the Morris Wetland Management District Office, Fergus Falls Wetland Management District Office and Big Stone National Wildlife Refuge to review the Project. USFWS representatives identified the Hillman WPA as high importance and preferred the line to be routed south. USFWS also identified the area south of the Morris Wetland Management District Office location and preferred the line to be farther south and east. In a follow-up email on February 13, 2024, USFWS provided the Applicants with a ROW process document and applicable policies that would be relevant to the Project.

On April 23, 2024, the Applicants inquired about USFWS grassland easements and required environmental reviews to inform routing efforts. USFWS responded on April 26, 2024, with additional information regarding USFWS concerns about flying waterfowl in the vicinity of the Project. On April 29, 2024, USFWS provided additional information regarding potential National Environmental Policy Act (NEPA) reviews.

The USFWS IPaC online tool was originally queried on May 29, 2024, for a list of federally threatened and endangered species, proposed species, candidate species, and designated critical habitat that may be present along the Route Options. An additional query to the USFWS IPaC system was made on August 28, 2024, after an August 8, 2024 Federal Register posting by USFWS announcing the proposed listing of two butterfly species potentially present in the Project Area. On May 23, 2024, the Applicants provided USFWS with shapefiles representing refined routes for the Project that would be shared during the fourth round of open houses and requested another meeting to discuss USFWS comments. The Applicants followed up with USFWS on June 4, 2024, and USFWS responded asking for clarification on the route options. The Applicants met again with USFWS on June 27, 2024. This meeting with the USFWS included the same local Service Staff from the first meeting but also included realty staff from their Midwest Regional Office in Bloomington, Minnesota. The Applicants discussed the USFWS ROW permitting process, potential NEPA requirements if the Project ROW were to be on a USFWS easement, and areas of concern for USFWS along the proposed Route Options. USFWS followed up with the Applicants after the meeting on June 27, 2024, and provided the Applicants with a copy of the "Application for Transportation, Utility Systems,

Telecommunications and Facilities on Federal Lands and Property" document. On June 28, 2024, USFWS sent the Applicants eagle and trumpeter swan nest locations on the Waldon WPA.

On July 31, 2024, USFWS provided feedback to the Applicants on routing for the Project and the proposed Route Options.

On August 20, 2024, the Applicants sent updated route shapefiles to USFWS for their review.

Between August 22 and 27, 2024, the Applicants coordinated with USFWS regarding potential permits for acquiring land rights for the ROW.

The Applicants will continue to consult with USFWS as needed for the Project.

8.1.2 State Agencies

The Applicants sent initial outreach letters to the state agencies as listed in Table 8.1-2 below. As needed, the Applicants have completed follow-up correspondence regarding the Project. See **Appendix F** for records of key correspondence with applicable state agencies.

Table 8.1-2 State Agency Outreach

Agency	Date of Initial Outreach Letter and Correspondence
Minnesota Association of Soil and Water Conservation Districts	November 10, 2023
Minnesota Association of Watershed Districts	November 10, 2023
Minnesota Board of Water and Soil Resources	November 10, 2023; December 7, 2023; December 11, 2023; June 11, 2024; June 12, 2024; June 25, 2024; October 2, 2024; October 18, 2024
Minnesota Department of Agriculture	November 10, 2023; September 4, 2024; September 11, 2024; September 20, 2024; September 25, 2024; October 11, 2024; October 14, 2024
Minnesota Department of Health	November 10, 2023
Minnesota Department of Natural Resources	October 17, 2023; November 10, 2023; January 26, 2024 (meeting); March 21, 2024; June 3, 2024; July 12, 2024; July 23, 2024; July 30, 2024 (meeting); July 31, 2024; August 20, 2024; August 22, 2024; September 13, 2024; September 24, 2024 (meeting); September 24, 2024
Minnesota Department of Transportation	October 27, 2023; November 10, 2023; November 13, 2023; November 22, 2023 (meeting); November 27, 2023; November 29, 2023; December 15, 2023 (meeting); December 15, 2023; February 29, 2024 (meeting); April 8, 2024 (meeting); June 3, 2024 (meeting); June 6, 2024; August 23, 2024; September 23, 2024
Minnesota Indian Affairs Council (MIAC)	April 21, 2023; November 10, 2023; December 4, 2023; June 19, 2024
Minnesota Public Utilities Commission	August 22, 2023 (meeting)

Agency	Date of Initial Outreach Letter and Correspondence
Minnesota Pollution Control Agency	October 26, 2023; November 10, 2023; December 4, 2023
Minnesota State Historic Preservation Office	November 10, 2023; December 28, 2023

8.1.2.1 Minnesota Board of Soil and Water Resources

On December 7, 2023, the Applicants sent a second Project notification email to BWSR which included a request for BWSR comments, specifically related to RIM and/or CREP easements within the Project Study Area. On December 11, 2023, the Minnesota BWSR responded with a copy of their Easement Alteration Policy and provided more details on BWSR easement restrictions and potential for crossings.

On June 11, 2024, the Applicants provided Project shapefiles to the Minnesota BWSR and requested BWSR comments. On June 12, 2024, BWSR responded that they are reviewing the shapefiles and noted that if it is determined that any permanent impacts will occur to RIM easements (tree removal, permanent structures, or access roads), BWSR will need to go through their easement alteration process to release those areas from the easement and be compensated for the affected acres. On June 24, 2024, the Minnesota BWSR informed the Applicants of one RIM easement that overlaps with the Project's ROW. The overlap would be approximately 3.75 acres of RIM easement 76-02-22-03 in Swift County recorded on March 1, 2024. There are no other RIM easements within the Project's ROW, however, Minnesota BWSR noted that additional easements were within the Route Width but located outside of the ROW.

On October 2, 2024, the Applicants provided Minnesota BWSR with updated Project shapefiles and requested their review of RIM easements within the Route Options. On October 18, 2024, Minnesota BWSR provided the Applicants with nine RIM easements that overlap with the Route Width of the Route Options.

8.1.2.2 Minnesota Department of Agriculture

In addition to the general Project description and outreach letter, the Applicants sent a copy of the draft AIMP to the MDA on September 11, 2024. On September 25, 2024, MDA confirmed that its review of the draft AIMP was complete and did not provide any comments. The Applicants revised the AIMP and sent a revised version to MDA on September 25, 2024. On October 14, 2024, MDA completed its review and noted it was "well done" and that MDA would submit formal comments once the Application has been submitted.

8.1.2.3 Minnesota Department of Natural Resources

Through the course of developing routes for the Project, the Applicants used MDNR's MCE and received a conservation planning report on October 17, 2023. On January 26, 2024, MDNR had a call with the Applicants to review the preliminary route alternatives for the Project and to discuss natural resource concerns, schedule, and Route Permit Application details in general. MDNR discussed preferences related to river crossings, areas of biodiversity, and threatened and endangered species.

On March 21, 2024, MDNR formally submitted comments as part of early coordination for the Project. MDNR identified avoidance areas, public watercourses, calcareous fens, rare features, and next steps (*see* **Appendix F** for MDNR comments).

On June 6, 2024, the Applicants submitted a formal NHIS request through MDNR's MCE and received the results from MDNR on August 22, 2024. The Natural Heritage Review results are described in **Section 7.4.12.3**. The Applicants submitted a supplemental NHIS database request for the modified Route Options to MDNR on September 24, 2024.

On July 12, 2024, MDNR provided the Applicants with early coordination comments on the Project. On July 23, 2024, the Applicants provided MDNR with an update on the Project and requested a meeting to continue consultation with MDNR. On July 30, 2024, the Project team met with regional environmental assessment ecologists from the MDNR to discuss their early coordination letter and their comments on the routes. On July 31, 2024, MDNR sent the Applicants a summary of the July 30, 2024, meeting which included a discussion of state-listed threatened and endangered species, rare natural communities, calcareous fens, and utility crossing license and access agreements.

On August 20, 2024, the Applicants sent shapefiles of the updated Route Options to the regional ecologists for their review. MDNR said they will forward the shapefiles to the other divisions and staff within the MDNR that will review the project routing. MDNR responded with comments on the updated Route Options on September 13, 2024. The Applicants met with MDNR again on September 24, 2024 to discuss the MDNRs comments on the updated Route Options.

The Applicants will continue to coordinate with MDNR as the routing process moves forward.

8.1.2.4 Minnesota Department of Transportation

The Applicants have had ongoing discussions about the Project with MnDOT about Project details and addressing any initial questions or concerns from MnDOT.

On October 27, 2023, MnDOT informed the Applicants of the Early Notification Memo (ENM) process and requested Project shapefiles. On November 22, 2023, MnDOT had a call with the Applicants (**Appendix F**). MnDOT requested the Applicants submit an ENM to allow for MnDOT to conduct their 30-day review. MnDOT also provided feedback on existing infrastructure that MnDOT would prefer to be avoided or would prefer the proposed transmission line would be parallel to, with MnDOT making note that there are scenic byways within the Project Study Area. MnDOT provided links to applicable policy and guidance documents after the meeting. On November 29, 2023, MnDOT provided the Utility ENM and Supplemental Checklist for the Applicants to provide once the routes were further defined.

On December 15, 2023, MnDOT had another call with the Applicants (**Appendix F**). MnDOT discussed the scenic byways near the proposed Project and the timing and contents of the ENM. MnDOT followed up via email with Capital Highway Investment Plan and State Transportation Improvement Plan information.

On April 8, 2024, MnDOT had another call with the Applicants (**Appendix F**). MnDOT discussed general transmission line routing considerations, including that scenic byway crossings be perpendicular with the span centered on the road to avoid visual impacts. MnDOT preferred for the Project to not enter the ROW of US Highway 12.

On June 3, 2024, MnDOT had another call with the Applicants (**Appendix F**). MnDOT reviewed the ENM process, general transmission line routing considerations, and existing infrastructure MnDOT would prefer to be avoided or would prefer the proposed transmission line would be parallel to. On June 6, 2024, MnDOT clarified that structures and foundations are allowed within the ROW of US Highway 75. However, per MnDOT standard practices, they would be required to be pushed as far back to the road ROW line as possible.

On August 23, 2024, the Applicants submitted the ENM request to MnDOT along with other supporting documents and the shapefiles for the two proposed route options. On September 23-24, 2024, MnDOT provided initial and supplemental comments on the ENM (*see* **Appendix F** for the complete supplemental comment dated September 23, 2024). MnDOT provided general transmission line routing considerations regarding structure placement, avoidance of MnDOT trunk highways, minimization measures near environmentally sensitive areas, and permit access for transmission line service or maintenance that minimizes interference to highway traffic. MnDOT also provided comments and recommendations on various resources including:

- Federal and State-listed protected species: consultations with USFWS, MDNR, species-specific field survey data, herbicide use, native vegetation establishment.
- Avian protection: tree clearing/trimming, clearing timeframe, nest surveys.
- Contaminated materials management: identify potential to encounter contaminated materials, environmental due diligence documents, sampling plan, regulatory file review recommendation at two locations.
- Roadside vegetation management: develop a vegetation management/pesticide/revegetation plan, field survey for noxious weeds, transportation of soil or plant parts from the site, ground disturbance and restoration, tree removal and valuation of impact).
- Wetlands coordination: aquatic resource delineation, restoration of temporary impacts and avoid/minimize/mitigate permanent impacts.
- Water permits with applicable Federal agencies.
- Floodplains: avoid placement of structures or fill in a floodplain.
- Cultural Resources: cultural resource desktop literature review/data, specific information at three areas the proposed Project crosses MnDOT ROW with resources, provide summary of cultural field surveys and coordination with SHPO and other agencies and parties, Post Review Discovery Plan, notification in the event of an unanticipated discovery.
- Environmental Assessment Unit/Environmental Review: comply with applicable laws and regulations, orders/decrees of bodies and tribunals with lawful jurisdiction over the work, such local ordinances as are applicable to the work, provide copies of environmental permits and inspection reports.
- Soil Erosion and Sediment Control/Stormwater: submit a copy of Construction SWPPP/erosion and sediment control details prior to filing Notice of Intent for coverage, soil compaction requirements, erosion control blanket requirements.
- Environmental Modelling and Testing (Noise): if potential to impact noise mitigation infrastructure, notify proper MnDOT staff.

- District Permitting Staff: coordinate with applicable staff for all downstream MnDOT utility permits, work with District 4 permits office.
- District Planning Staff: permanent access would not be allowed, but may allow temporary access after District review of proposed entry point.
- Blowing Snow Control/Snow Fences: one location identified where a living and/or structural snow fence is in the vicinity of the proposed Project, if impacts to snow fence must work with MnDOT to find a solution.

MnDOT included general comments and no specific guidance (in bold) in the following topics: Regulated Waste and Storage Tanks, FHWA National Scenic Byway Program, Design Support/Safety and Operations Management, Railroad, and Airport Influence Area.

The Applicants will continue to coordinate with MnDOT as the routing process moves forward.

8.1.2.5 Minnesota Indian Affairs Council

The Applicants sent an initial Project notification letter to the MIAC on April 29, 2023, and a follow-up Project notification letter on November 10, 2023. MIAC responded by letter on December 4, 2023, and requested to remain a consulting party and would conduct a formal review when the routes were further defined. The Applicants sent a follow-up letter to MIAC on June 19, 2024. The Applicants will continue to coordinate with MIAC as the routing process moves forward.

8.1.2.6 Minnesota State Historic Preservation Office

The Minnesota SHPO responded to the initial Project notification letter on December 28, 2023, and recommended the Applicants complete a background literature review to identify currently inventoried historic/architectural properties, including those currently designated in the National or State Register of Historic Places and recorded archaeological sites within the route corridor area. The Minnesota SHPO also recommended that a Phase IA archaeological assessment be completed and, if as a result of this assessment, a Phase I reconnaissance archaeological survey is recommended, then the Phase I survey should be conducted. The Minnesota SHPO had additional suggestions related to impact considerations and reporting (*see* **Appendix F**).

8.1.3 Tribal Governments

On April 21, 2023, the Applicants sent initial outreach letters to all federally recognized Tribes in Minnesota and Tribes that may have ancestral interest in the Minnesota counties crossed by the Project. A second follow-up letter was sent to Tribal

contacts on June 19, 2024. A follow up phone call was made to each of the Tribes on July 2, 2024, to make sure they got the letter and ask if they had any additional questions. A list of the Tribes that were notified is included in Table 8.1-3 and an example of the letter is included in **Appendix F**.

Table 8.1-3 Tribal Government Outreach

Tribal Government	Date of Initial Outreach Letter and Correspondence
Apache Tribe of Oklahoma	April 21, 2023; June 19, 2024
Bad River Band of the Lake Superior Tribe of Chippewa Indians of the Bad River Reservation, Wisconsin	April 21, 2023; June 19, 2024
Bois Forte Band of Chippewa	April 21, 2023; June 19, 2024
Cheyenne and Arapaho Tribes, Oklahoma	April 21, 2023; June 19, 2024
Flandreau Santee Sioux Tribe of South Dakota	April 21, 2023; June 19, 2024
Fond du Lac Band of the Minnesota Chippewa Tribe	April 21, 2023; June 19, 2024
Fort Belknap Indian Community of the Fort Belknap Reservation of Montana	April 21, 2023; June 19, 2024
Grand Portage Band of the Minnesota Chippewa Tribe	April 21, 2023; June 19, 2024
Iowa Tribe of Kansas and Nebraska	April 21, 2023; June 19, 2024
Keweenaw Bay Indian Community, Michigan	April 21, 2023; June 19, 2024
Lac du Flambeau Band of Lake Superior Chippewa Indians of the Lac du Flambeau Reservation of Wisconsin	April 21, 2023; June 19, 2024
Lac Vieux Desert Band of Lake Superior Chippewa Indians	April 21, 2023; June 19, 2024
Leech Lake Band of Ojibwe	April 21, 2023; June 19, 2024; June 24, 2024
Lower Sioux Indian Community in the State of Minnesota	April 21, 2023; June 19, 2024
Menominee Indian Tribe of Wisconsin	April 21, 2023; June 19, 2024
Mille Lacs Band of Ojibwe	April 21, 2023; April 24-27, 2023; February 5, 2024; June 19, 2024
Prairie Island Indian Community in the State of Minnesota	April 21, 2023; June 19, 2024
Red Cliff Band of Lake Superior Chippewa Indians of Wisconsin	April 21, 2023; June 19, 2024
Red Lake Band of Chippewa Indians	April 21, 2023; June 19, 2024
Santee Sioux Nation, Nebraska	April 21, 2023; June 19, 2024

Tribal Government	Date of Initial Outreach Letter and Correspondence
Shakopee Mdewakanton Sioux Community, Minnesota	April 21, 2023; June 19, 2024; July 2, 2024
Sisseton Wahpeton Oyate of the Lake Traverse Reservation	April 21, 2023; June 27, 2023 (meeting); February 16, 2024 (meeting); June 19, 2024
Sokaogon Chippewa Community, Wisconsin	April 21, 2023; June 19, 2024
Spirit Lake Tribe, North Dakota	April 21, 2023; June 19, 2024
Upper Sioux Community, Minnesota	April 21, 2023; June 19, 2024
White Earth Band of the Minnesota Chippewa Tribe	April 21, 2023; June 19, 2024

On April 21, 2023, a representative from the Mille Lacs Band of Ojibwe contacted the Applicants to note that the only interest the Mille Lacs Band of Ojibwe have for the Project is for the protection of their Usual and Accustomed Places for Cultural Resources protection and requested more information about the Project facilities. Between April 24 and April 27, 2023, the Applicants provided the coordinates and maps showing the location of the Alexandria Substation, at the request of the Mille Lacs Band of Ojibwe. On February 5, 2024, the Mille Lacs Band of Ojibwe recommended the Applicants coordinate with other THPOs in the Project Study Area and to plan for a tribal monitor to be present on-site during construction.

On April 21, 2023, a representative from the Shakopee Mdewakanton Sioux Community contacted the Applicants and requested to stay informed of the Project.

On June 27, 2023, the Applicants met with the Sisseton Wahpeton Oyate THPO to discuss the Project, potential impacts, and future SHPO reviews. The Sisseton Wahpeton Oyate THPO requested to be consulted as the Applicants continue developing the Project. The Applicants agreed to coordinate future cultural resource surveys with the Sisseton Wahpeton Oyate. The Applicants met with the Sisseton Wahpeton Oyate THPO on February 16, 2024, to discuss updates to the Project. On June 19, 2024, the Applicants emailed the shapefiles of the proposed Route Options to multiple Tribes.

On June 24, 2024, the Leech Lake Band of Ojibwe THPO confirmed that they did not have any recorded historic properties within the Project Study Area. They requested that "Should any human remains or suspected human remains be encountered, all work shall cease and the following personnel should be notified immediately: County Sheriff's Office, Office of the State Archaeologist, and the Leech Lake Band of Ojibwe along with other interested parties."

On July 2, 2024, the Shakopee Mdewakanton Sioux Community, Minnesota confirmed that they "will be leaving direct consultation to those Tribes closer to the project area."

The Applicants will continue to coordinate with the Tribes who have expressed an interest in participating in the Project as it moves forward.

8.1.4 Local Government Units

The Applicants also corresponded with several LGUs about the Project leading up to the filing of this Application. On November 10, 2023, the Applicants sent an initial outreach letter to the LGUs describing the Project and requesting comments (*see* Table 8.1-4 and **Appendix F**). Pursuant to Minn. Stat. § 216E.03, on June 21, 2024, the Applicants also sent LGUs a 90-day notice letter to inform them of the Project and the opportunity to arrange for a pre-application consultation meeting with the Applicants. Details regarding in-person or virtual meetings requested by the LGUs are described below.

Table 8.1-4 Local Government Outreach

Local Government Unit	Date of Initial Outreach Letter and Correspondence
Minnesota Counties	
Big Stone County	June 20, 2023 (meeting); November 10, 2023; November 21, 2023 (meeting); April 16, 2024 (meeting); May 7, 2024 (meeting)
Douglas County	April 7, 2023 (meeting); October 17, 2023 (meeting); November 10, 2023; April 9, 2024 (meeting); June 5, 2024 (meeting)
Grant County	April 7, 2023 (meeting); December 19, 2023 (meeting)
Lac qui Parle County	May 16, 2023 (meeting); October 17, 2023 (meeting); November 10, 2023
Pope County	June 13, 2023 (meeting); August 8, 2023 (meeting); October 10, 2023 (meeting); November 10, 2023; April 9, 2024 (meeting); May 14, 2024 (meeting)
Stevens County	June 20, 2023 (meeting); November 10, 2023; November 21, 2023 (meeting); March 19, 2024 (meeting); June 18, 2024 (meeting)
Swift County	July 5, 2023 (meeting); November 10, 2023; March 19, 2024 (meeting); May 21, 2024 (meeting)
Minnesota Cities and Townships	
Ben Wade Township	November 10, 2023
Benson Township	November 10, 2023
Blue Mounds Township	November 10, 2023
Big Stone Township	March 26, 2024 (meeting)
Clontarf Township	November 10, 2023
City of Alexandria	November 10, 2023
City of Clontarf	November 10, 2023
City of Danvers	November 10, 2023

Local Government Unit	Date of Initial Outreach Letter and Correspondence
City of Forada	November 10, 2023
City of Glenwood	November 10, 2023
City of Hancock	November 10, 2023
City of Holloway	November 10, 2023
City of Lowry	November 10, 2023
City of Odessa	November 10, 2023
City of Ortonville	November 10, 2023
City of Starbuck	November 10, 2023
Damen Township	November 10, 2023
Fairfield Township	November 10, 2023; December 11, 2023
Framnas Township	November 10, 2023
Hegbert Township	November 10, 2023
Hodges Township	November 10, 2023
Hoff Township	November 10, 2023
Holmes City Township	November 10, 2023
Horton Township	November 10, 2023
Hudson Township	November 10, 2023
La Grand Township	November 10, 2023
Lake Mary Township	November 10, 2023; November 14, 2023 (meeting); February 20, 2024 (meeting); July 17, 2024 (meeting)
Langhei Township	November 10, 2023
Leven Township	November 10, 2023
Marysland Township	November 10, 2023
Minnewaska Township	November 10, 2023
Moe Township	November 10, 2023
Moore Township	November 10, 2023
Morris Township	November 10, 2023
Moyer Township	November 10, 2023
New Prairie Township	November 10, 2023
Nora Township	November 10, 2023
Reno Township	November 10, 2023
Shible Township	November 10, 2023
Six Mile Grove Township	November 10, 2023
Swan Lake Township	November 10, 2023
Tara Township	November 10, 2023
Walden Township	November 10, 2023
White Bear Lake Township	November 10, 2023

Local Government Unit	Date of Initial Outreach Letter and Correspondence
Other LGUs	
Big Stone Area Growth	November 10, 2023
Big Stone City Development Corporation	November 10, 2023
Big Stone Soil and Water Conservation District	November 10, 2023
Bois De Sioux Watershed District	November 10, 2023
Douglas County Soil and Water Conservation District	November 10, 2023
Lac qui Parle County Soil and Water Conservation District	November 10, 2023
Ortonville EDA	November 10, 2023
Pope County Soil and Water Conservation District	November 10, 2023; November 16, 2023
Stevens County Soil and Water Conservation District	November 10, 2023
Swift County Soil and Water Conservation District	November 10, 2023
Upper Minnesota River Watershed District	November 10, 2023
Yellow Bank Watershed District	November 10, 2023

8.2 Public Outreach

Public outreach for the Project consisted of digital engagement, informational mailings, and open house meetings, as described below. In addition to outreach to landowners and communities, the Applicants also met with other environmental and civic organizations to discuss the Project.

8.2.1 Website and Digital Engagement

The Applicants established a Project website, www.bigstonesouthtoalexandria.com, to provide key Project information for the public. The website contains a description of the Project scope and schedule, explanation of the Project need, static and interactive maps, a Project library that includes frequently asked questions, and open house meeting documents. To facilitate public involvement, the website contains a comment form and

comment map, telephone number, an informational email address, and a page with past and upcoming events, including the open houses, and public input meetings and hearings. The forementioned channels will continue to be accessible to the public and stakeholders to use for asking questions, requesting information, and requesting meetings. The website will continue to be updated through Project construction and restoration. The website had approximately 3,900 total users and 12,000 views from April 24, 2023, through July 8, 2024.

The Applicants established a Project email address connect@bigstonesouthtoalexandria.com and a hotline (800) 598-5587 as a way for the public to contact the Project team. The email and hotline were included on all outreach and materials and are monitored closely to timely respond to any correspondence, as needed.

Website and digital engagement materials are provided in **Appendix G**.

8.2.2 Mailings and Notifications

The Applicants sent four mailers, in postcard form, providing notification of each of the open houses to landowners, Tribal leaders, government agencies, and stakeholders informing them about the Project and engagement opportunities. The mailer included information about the Project and in-person open houses, a map image (Study area, Project corridors, Route corridors, and Proposed Route Options) for each round, ways to provide feedback, and how to contact the Applicants. Using parcel information obtained from counties, the Applicants sent over 85,000 mailers for the four rounds of open houses.

Additionally, emails were sent to approximately 365 stakeholders and landowners on the Applicants' email distribution list to invite them to the third and fourth rounds of in-person and virtual engagement opportunities.

In an effort to notify landowners in the vicinity of the Project about the MPUC's CN public hearings, the Applicants sent postcards to 22,091 landowners and stakeholders, including Tribal leaders, government agencies, and others informing them about the upcoming MPUC hearings.

The Applicants also ran multiple newspaper advertisements to promote the open houses. A total of seventy advertisements of various sizes and durations were run in local newspapers for the four rounds of open houses. The Applicants also received media coverage for the Project and open houses including two live interviews with KDIO radio out of Ortonville, MN.

The Applicants established a social media campaign to engage with the communities near the Project Study Area and promote upcoming engagement

opportunities. The Applicants posted on Facebook and ran Facebook paid ads that promoted the four rounds of open houses with a total reach of approximately 53,425 users. The Facebook post or ads for each open house ran a few weeks prior to each open house targeting zip codes in the Project study area.

Mailings and notifications are provided in **Appendix G**. A list of landowners along and adjacent to the Route Options is provided in **Appendix N**.

8.2.3 Open House Meetings

In early 2023, the Applicants developed a public engagement strategy that consisted of four rounds of open houses:

- Round 1: Study Area.
- Round 2: Project Corridors.
- Round 3: Route Corridors.
- Round 4: Proposed Route Options.

Materials available at each open house included a Project overview handout, tabletop maps, map exhibit boards, comment forms, and an interactive GIS mapping station. Additionally, materials from the in-person open houses were uploaded to the Project website. Information packets were available to those who were not able to attend the open houses or requested them. During and after the open house meetings, comments were collected and considered in refining Project routing. More information regarding open house meetings is provided in **Section 4.4**.

In April 2023, three in-person open house meetings were held for the Project. A total of approximately 144 people attended. In October 2023, five in-person open house meetings were held for the Project. A total of approximately 104 people attended. In February 2024, five in-person open house meetings were held for the Project. A total of approximately 301 people attended. In June 2024, four in-person open house meetings were held for the Project. A total of approximately 246 people attended.

Open house materials are provided in **Appendix G**.

8.2.4 Summary of Comments

Over the duration of public outreach leading up to this filing, approximately 317 comments were received via the Project hotline, website, email, in-person, text message, written and verbal.

During Round 1, comments received included:

- Routing questions.

- Requests to be added to the Project mailing list.

During Round 2, common comment topics included:

- Preferences where the line would be placed on specific properties.
- Concern for overall number of existing transmission structures.
- Agricultural concerns including accommodating equipment size, center pivot irrigation, drip irrigation, drain tile, and crop dusting.
- Concerns for wildlife habitat.
- General questions about next steps and timeline.

During Round 3, a few landowners expressed skepticism about the Project development or assumed the Applicants already had a route selected. The Applicants reassured landowners that no Route Options had been selected and that stakeholder input is a crucial part in routing efforts. Comment topics included:

- Preferences where the line will be placed on specific properties.
- Relationships between the Project and wind developers.
- Agricultural concerns including accommodating equipment size, center pivot irrigation, drip irrigation, drain tile, and crop dusting.
- Concerns and questions about stray voltage and electric and magnetic fields.
- General questions about the easement and ROW process.

During Round 4, landowners were eager to see the Route Options and discuss the routing process in detail. Attendees were able to print a map of their property from one of six GIS stations available and visit with land agents and project staff to discuss potential preferences or concerns. Comment topics included:

- Preferences where the line will be placed on specific properties.
- Agricultural concerns include accommodating equipment size, center pivot irrigation, drip irrigation, drain tile, and crop dusting.
- The MPUC permitting process.
- General questions about the easement and ROW process.

A comment summary from these open houses is provided in **Appendix G**.

8.3 Route Modifications Incorporated Through Agency, Tribal, and Public Involvement

The Applicants worked with the public and agencies to inform the routing process. In addition to public and agency outreach, the Applicants created a Project website to provide key Project information for the public including a map of the proposed routes and information on how to submit comments on route modification requests and/or to attend the public open house meetings held.

There were numerous route modifications presented around the time of the fourth round of open houses in late June 2024. After consideration and review by the Applicants, the following route modifications were made:

- Where the Route Option runs adjacent to the Big Stone National Wildlife Refuge, the 1,000-foot Route Width was shifted so there was no overlap with the Big Stone National Wildlife Refuge.
- A second Route Option (South 2) was added in the South Segment at the Minnesota/South Dakota border to follow an existing transmission line corridor.
- An area along the South Segment paralleling near U.S. Highway 12 was shifted south of the highway away from a USFWS-protected wetland complex.
- An area along the Central Segment paralleling three WPAs was shifted to avoid easement overhang of the WPAs.
- In the Central Segment, high densities of center pivot irrigation and in close proximity to known nesting trumpeter swans and bald eagles resulted in route modifications to reduce the number of potential impacts.
- USFWS indicated a new land acquisition in the North Segment was recently purchased and the route was shifted to avoid the new WPA.

These route modifications are reflected in the proposed Route Options described throughout this Application.

9.0 APPLICATION OF RULE CRITERIA

The Applicants have designed and routed the Project in accordance with Minn. Stat. § 216E.02, subd. 1, by minimizing adverse human and environmental impacts and ensuring continuing electric power system reliability and integrity. The Applicants have considered the standards and criteria in Minn. Stat. § 216E.03, subd. 7; and Minn. R. 7850.4000, and are proposing a Project that is consistent with the state's goals to conserve resources, minimize environmental impacts and impacts to human settlement, minimize land use conflicts, and ensure the state's electric energy security through efficient, cost-effective transmission infrastructure.

For all the reasons set forth in this Application and as supported by the Appendices hereto, the Applicants respectfully request that the Commission issue a Route Permit authorizing construction of the Big Stone South to Alexandria Transmission Project proposed to be located in Minnesota.

10.0 GLOSSARY OF TERMS/ACRONYMS

ACRONYMS	
AADT	Annual Average Daily Traffic
AGL	Above ground level
AIMP	Agricultural Impact Mitigation Plan
AM	Amplitude Modulation
AMAs	Aquatic Management Areas
APLIC	Avian Power Line Interaction Committee
Applicants	Otter Tail Power Company and Western Minnesota Municipal Power Agency
Application	Route Permit Application for the Big Stone South to Alexandria Transmission Project
Application Alignment	The centerline of the proposed transmission line.
ARMER	Allied Radio Matrix for Emergency Response
ATV	All-terrain vehicle
AUID	Assessment Unit Identification Number
BCC	Birds of Conservation Concern
BMPs	Best Management Practices
BNSF	Burlington Northern Santa Fe
BWSR	Minnesota Board of Water and Soil Resources
CAA	Clean Air Act
CAN	Candidate
Central Flyway	Central Flyway of North America
CH4	Methane
CN	Certificate of Need
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
Commission or MPUC	Minnesota Public Utilities Commission
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CWA	Clean Water Act
Dakota	The Yankton Dakota and Sisseton Dakota.
dBA	Decibel – A weighted
DHS	United States Department of Homeland Security
DTV	Digital television
ECS	Ecological Classification System

ACRONYMS	
EERA	Department of Commerce, Energy Environmental Review and Analysis
EIS	Environmental Impact Statement
ELF	Extremely Low Frequency
EMF	Electromagnetic Fields
EMI	Electromagnetic interference
EMS	Emergency medical services
END	Endangered
ENM	Early Notification Memo
ESA	Endangered Species Act
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FM	Frequency Modulation
FSA	Farm Service Agency
GHG	Greenhouse gas
GPS	Global Positioning System
GRP	Grassland Reserve Program
GWP	Global Warming Potential
HIFLD	Homeland Infrastructure Foundation Level Database
HUC	Hydrologic Unit Code
HVTL	High Voltage Transmission Line
I-94	Interstate 94
IBA	Important Bird Area
IPaC	Information for Planning and Consultation
kHz	Kilohertz
kV	Kilovolt
kV/m	Kilovolts Per Meter
LGUs	Local Government Units
LFEO	Lake and Flood Elevations Online
LRTP	Long-Range Transmission Project
mA	MilliAmperes
MBS	Minnesota Biological Survey
MCE	Minnesota Conservation Explorer
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MDR	Minnesota Department of Revenue

ACRONYMS	
mG	Milligauss
MHz	Megahertz
MIAC	Minnesota Indian Affairs Council
Minn. R.	Minnesota Rules
Minn. Stat. §	Minnesota Statutes Section
MISO	Midcontinent Independent System Operator
MNDEED	Minnesota Department of Employment and Economic Development
MnDOT	Minnesota Department of Transportation
MNGC	Minnesota Geospatial Commons
MPCA	Minnesota Pollution Control Agency
MRES	Missouri River Energy Services
MW	Megawatt
MWI	Minnesota Well Index
N2O	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NACs	Noise Area Classifications
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NHIS	Natural Heritage Inventory System
NOx	Nitrogen Oxides
NPC	Native Plant Communities
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRT	National Recreational Trail
NWI	National Wetlands Inventory
OHGW	Overhead ground wire
OHWL	Ordinary high water level
OPGW	Optical ground wire
ORVW	Outstanding Resource Value Waters
OSA	Minnesota Office of the State Archaeologist
Otter Tail	Otter Tail Power Company
PHMSA	Pipeline and Hazardous Materials Safety Administration
PLSS	Public Land Survey System
PM2.5	Fine particulate matter equal to or less than 2.5 microns in diameter.
PM10	Particulate matter equal to or less than 10 microns in diameter.

ACRONYMS	
Project	The Big Stone South to Alexandria Transmission Project
Project Study Area	The approximately 58 miles by 46 miles area of land used to establish boundaries and limits for the information-gathering process and develop the Route Options.
PWI	Public Water Inventory
RIM	Reinvest in Minnesota
ROW	Right-of-Way
RTK	Real-Time Kinematic
SCAQMD	South Coast Air Quality Management District
SD	School District
SDPUC	South Dakota Public Utilities Commission
SHPO	Minnesota State Historic Preservation Office
SNAs	Scientific and Natural Areas
SO2	Sulfur Dioxide
SOO	SOO Line
SPC	Special Concern
SSA	Sole Source Aquifer
SSURGO	Soil Survey Geographic
Subp.	Subparagraph
SWPPP	Stormwater Pollution Prevention Plan
TCSBs	Temporary Clear Span Bridges
THPO	Tribal Historic Preservation Office
THR	Threatened
TP	Twisted pair
TR 7	Township Road 7
UHF	Ultra high frequency
USACE	United States Army Corps of Engineers
USC	United States Code
USCB	United States Census Bureau
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VHF	Very high frequency
VMP	Vegetation Management Plan
VOC	Volatile Organic Compound
WAPA	Western Area Power Administration
Western Minnesota	Western Minnesota Municipal Power Agency

ACRONYMS	
WHO	World Health Organization
WHPAs	Wellhead Protection Areas
WMAs	Wildlife Management Areas
Working Group	Interagency Working Group
WPAs	USFWS Waterfowl Production Areas

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