






Draft Environmental Impact Statement

Monticello to St. Cloud 345 kV Transmission Line

PUC Docket No. E002, ET2/TL-09-246

January 2010

office of energy security

Monticello to St. Cloud
345 kV Transmission Line
Draft Environmental Impact Statement

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Abstract

Pursuant to the provisions of Minnesota Statutes, Chapter 216E, Great River Energy, and Xcel Energy (the applicants) filed a route permit application with the Minnesota Public Utilities Commission (the commission) on April 8, 2009, for a permit to construct approximately 28 miles of 345 kilovolt (kV) transmission line from Monticello to St. Cloud. The Project is designed to increase generation outlet capability and improve regional reliability, and enhance local community reliability. Also included is the construction of one new substation and the modification of the existing Monticello Substation.

The commission rules regarding route permits require a number of procedural steps, including public notice, information meetings, a draft and final environmental impact statement (EIS), a public-contested case hearing, and finally a decision by the commission (Minn. Rules 7850.3900). The primary purpose of this draft EIS is to summarize the potential impacts of the Project and help the commission make an informed decision on the best route. The Office of Energy Security (OES) Energy Facility Permitting (EFP) is part of the Minnesota Department of Commerce and is tasked with conducting environmental review of applications for transmission line route permits. The intent of the environmental review process is to inform the public, the applicant, and decision-makers about potential impacts and possible mitigations for a proposed Project. The OES is responsible for developing the EIS for this Project.

PUBLIC MEETINGS AND HEARINGS

The Office of Energy Security will be holding public information meetings on the Draft EIS on February 9, 2010, at 2:00 pm and 6:00 pm, in the in Clearwater Town Hall. Comments on the Draft EIS will be accepted until February 19, 2009. Please refer to PUC Docket No. E002, ET2/TL-09-246 in all correspondence. Comments should be sent by e-mail, fax, or U.S. mail to Mr. David Birkholz (contact information below). Comments may also be submitted online at: http://energyfacilities.puc.state.mn.us/publiccomments.html.

A copy of this Draft Environmental Impact Statement can be reviewed at the following libraries:

Saint Cloud Public Library 405 St. Germain Street West Saint Cloud, MN 56301	**Monticello Public Library** 200 West 6th Street Monticello, MN 55362
Elk River Public Library 13020 Orono Parkway Elk River, MN 55330	**Buffalo Library** 18 NW Lake Boulevard Buffalo, MN 55313
Stickney Crossing Library 822 Clearwater Center Clearwater, MN 55320	**Al Ringsmuth Library** 253 North 5th Avenue Waite Park, MN 56387

A public hearing on the project will also be held as a separate proceeding. The Commission has turned the process over to the Office of Administration Hearings to hold the hearing. A combined public hearing and evidentiary hearing will be held on March 8, 2010, at 2:00 p.m. and 7:00 p.m., at the Clearwater Township Hall, Clearwater, Minnesota, and will continue on March 9-12, 2010, as necessary. The hearing will be conducted by Administrative Law Judge (ALJ)

Beverly Jones Heydinger, who will ensure that the record created at the hearing is preserved and transmitted to the Commission. The ALJ will prepare a report that will include proposed findings of fact and conclusions and a recommendation.

Additional sessions may be provided if necessary to hear all interested parties wishing to testify. It is not necessary to attend more than one session to have your input heard and included in the record. All members of the public are welcome to attend any public hearing sessions.

FINAL EIS

After the comment period, the Office of Energy Security Energy Facility Permitting staff will prepare a Final EIS. The Final EIS will include revisions to the draft as well as staff responses to substantive comments on the draft. The Final EIS is scheduled to be completed by March 19, 2010, and included in the compiled record turned over to the PUC by the ALJ.

LIST OF PREPARERS/CONTRIBUTORS

- David E. Birkholz, Project Manager
- HDR Engineering, Inc.
- Supplemental information not contained in the Applications was provided by the Applicant through NRG, Inc.

This document can be made available in alternative formats (voice/TTY) by contacting the Minnesota Relay Service at 711 or 1-800-627-3529.

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Acronym List

Acronym	Meaning
AC	alternating current
ACSS	Aluminum Conductor Steel Supported
ALJ	Administrative Law Judge
ATF	advisory task force
BCC	Birds of Conservation Concern
BMP	Best Management Practice
BWSR	Minnesota Board of Water and Soil Resources
CSAH	County-State Aid Highway
CWA	Clean Water Act of 1979
dB	Decibel
DEIS	Draft Environmental Impact Statement
ECS	Ecological Classification System
EIS	Environmental Impact Statement
EMF	electromagnetic fields
EPA	Environmental Protection Agency
EPRI	Electric Power Research Institute
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
HVTL	high-voltage transmission line
MCBS	Minnesota County Biological Survey
Mn/DOT	Minnesota Department of Transportation
MnDNR	Minnesota Department of Natural Resources
MOU	Memorandum of Understanding
NERC	North American Electric Reliability Corporation
NESC	National Electric Safety Code
NEV	neutral-to-earth voltage
NHIS	Natural Heritage Information System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
NWR	National Wildlife Refuge
OES	Minnesota Office of Energy Security
OSA	Office of the State Archaeologist
PWI	Public Waters Inventory
RIM	Reinvest in Minnesota
ROW	Right-of-way
SF6	sulfur hexafluoride

Acronym	Meaning
SHPO	Minnesota State Historic Preservation Office
SNA	Scientific Natural Area
TH	Trunk Highway
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WCA	Wetland Conversation Act
WMA	Wildlife Management Area
WPA	Waterfowl Protection Area

SUMMARY

The project being analyzed in this Environmental Impact Statement (EIS) is one of four transmission projects proposed as part of the CapX2020 Transmission Initiative. CapX2020 is a joint initiative of 11 transmission-owning utilities in Minnesota, Wisconsin, and the surrounding region.

The proposed project consists of approximately 28 miles of 345 kV transmission line and a 345/115 kV substation, the Quarry Substation. The proposed 345 kV transmission line would be constructed primarily with single-pole self-weathering or galvanized steel structures, ranging in height from 130 to 175 feet, with a span length ranging from 600 to 1,000 feet between poles. The typical right-of-way (ROW) for the 345 kV transmission line would be 150 feet.

Construction of the proposed Quarry 345/115 kV Substation will require a graded, fenced area of 15 acres within a total area of up to 40 acres. Equipment to be installed includes 345 and 115 kV equipment (including a transformer, switches, control panels, and circuit breakers), foundations, and structures. The substation yard will also require access roads.

Under the Minnesota Power Plant Siting Act, a route may have a variable width of up to 1.25 miles. In this case, the applicants have requested a route width of 500 feet on each side of a preliminary centerline (1,000-foot total width) for most areas in order to allow for flexibility during final design. The maximum route width of 1.25 miles was requested to accommodate site specific considerations and substation interconnection. The commission can and may limit a new power line to a more specific route in the permit.

The Office of Energy Security (OES) reviewed and updated the information in the utility's route permit application, including house locations, numbers of houses within various distances from the routes, airport locations and potential conflicts, as well as natural resource data such as wetlands, rare species, and other information.

The OES also analyzed each of the alternative route segments proposed during the scoping process that were selected for detailed review in the EIS. These alternative route segments were evaluated at the same level of detail as that for the Applicant Preferred Route and Applicant Alternate routes.

The OES has prepared this Draft EIS (DEIS) for the proposed Project, consistent with the EIS Scoping Decision. A DEIS comment period in concert with a public information meeting will follow the release of this DEIS. After the close of the comment period, the OES staff will prepare a Final EIS (FEIS) based on public comments. The FEIS will include revisions to the draft as well as staff responses to substantive comments on the DEIS.

The commission will hold a formal public hearing regarding the best route for the proposed line (Minn. Stat. 216E.03, subd. 6). The hearing, presided over by a state-appointed administrative law judge, is scheduled to occur on March 8, 2010, at 2:00 p.m. and 7:00 p.m., and will continue on March 9 through 12, 2010, as necessary, to complete the process. Interested persons will have an opportunity at the hearing to ask questions about the proposed Project and provide comments that will become part of the administrative record.

This DEIS covers the required environmental review of the Project and route permit application.

- **Section 1** describes the proposed Project, including location, route description, and right-of-way requirements.
- **Section 2** provides information about the regulatory framework for the Project, including permitting procedures, public scoping and review processes, and hearings before the commission.
- **Section 3** describes the engineering and operation design for the proposed transmission line and associated facilities.
- **Section 4** provides information on the proposed construction and maintenance procedures.
- **Section 5** provides detail on the affected environment, potential impacts and mitigation of those impacts for the four routes and three substations.
- **Section 6** outlines the required permits and approvals for the proposed Project.
- **Section 7** provides the document's references.

Five route alternatives are being analyzed in this EIS; all are located in Sherburne, Wright, and Stearns counties in Minnesota. All of the route alternatives commence at the Monticello substation and terminate at a new Quarry substation west of St Cloud. The Applicant Preferred Route, Route A, Route B, and Route C travel in a northwest direction through Monticello, Silver Creek, Clearwater, Lynden and St. Joseph townships on the south side of the Mississippi River. Route D travels in a in a northwest direction through Monticello, Becker, Clear Lake, Haven, and St. Joseph townships on the north side of the Mississippi River.

Three substation alternatives are analyzed in this EIS. Two of the substation alternatives, the Quarry Substation Site 1 and the Quarry Substation Site 2, are located in St. Joseph Township. The northern half of the third substation alternative, Quarry Substation Site 3, is located St. Joseph Township and the southern half of the site is located in Rockville Township.

The EIS analyzes the human and environmental impacts within each of the route and substation alternatives. It provides information to assist decision-makers in making an informed decision on the ability to construct and operate a transmission line and substation that avoids or minimizes social, economic, and environmental impacts. The potential impacts of the various route options are analyzed for each major human or natural resource issue in Section 5.0.

- Human settlement and socioeconomics
- Land use and property
- Aesthetics
- Parks and trails
- Water resources

- Wildlife, vegetation, and habitat
- Cultural resources
- Transportation
- Noise and air quality
- Electric and magnetic fields and associated potential effects

A summary table describing the potential for impacts on these resources for each of the proposed routes and substation locations can be found in Appendix I of the EIS. A summary of the key issues with each of the five routes is provided below.

Applicant Preferred Route:

The Applicant Preferred Route was proposed as an option to take advantage of the existing right-of-way (ROW) of Interstate 94 (I-94). Three highway ROW occupancy scenarios were considered; maximum ROW occupancy, minimum ROW occupancy, and no ROW occupancy; maximum and minimum occupancy scenarios could have impacts to transportation system operations and maintenance. Examination of this route and potential transmission line alignments indicates that residential displacements would likely be avoided, and this route has the fewest impacts to center pivot irrigation systems of any of the routes. This route also does not require crossings of the Mississippi River. Construction and operation of a transmission line along this route would likely modify the aesthetic setting of the project area, which could be a greater concern in scenic areas, especially along the Great River Road (County Highway 75).

As is true of all the route options, agriculture is the primary land use within the route, and agricultural lands would bear the greatest share of the non-highway ROW land use impact. However, agricultural land within transmission line ROW can generally continue to be used for agricultural purposes, with the exception of pole locations.

Route A:

Route A would also potentially take advantage of the presence of I-94 ROW. Three ROW occupancy scenarios (maximum ROW occupancy, minimum ROW occupancy, and no ROW occupancy) were considered for Route A; maximum and minimum occupancy scenarios could have impacts to transportation system operations and maintenance. Route A would also likely avoid displacement of residences. A greater number of center pivot irrigation systems would be impacted under the Route A option than under the Applicant Preferred Route, but impacts would be limited. Mississippi River crossings would be avoided under Route A. Aesthetic impacts would be similar to the Applicant Preferred Route, including potential impacts to the Great River Road.

Routes B and C:

Routes B and C were proposed as options to occupying I-94 ROW, and do not parallel I-94. As with the other route options, displacement of residences would be avoided. Impacts to center pivot irrigation systems would be similar to those identified for Route A. Routes B and C do not cross the Mississippi River. Aesthetic impacts to the area would likely occur, but impacts to the

Great River Road would be avoided. Both of these routes would follow less existing linear corridor such as highway and existing transmission lines than the Applicant Preferred Route. These routes also have the most residences existing in the corridor which could potentially be impacted by the transmission line construction.

Route D:

Route D could occupy I-94 ROW which could have impacts to transportation system operations and maintenance. However, the occupation of I-94 ROW would be for a significantly shorter distance than under the Applicant Preferred Route and Route A options. Route D also affords the opportunity to be located adjacent to or co-located with an existing 115 kV transmission line, which could limit land use and aesthetic impacts, but could also reduce transmission system redundancy. Residential displacement would likely be avoided under the Route D option. The greatest number of center pivot irrigation systems would likely be affected under Route D. Potential impacts to the Great River Road would be limited to a crossing at the County Highway 75/I-94 interchange. Two Mississippi River crossings would be required under the Route D option, although crossings would likely be in locations adjacent to or co-located with an existing 115 kV transmission line.

1.0 INTRODUCTION

On April 8, 2009, Great River Energy and Xcel Energy (Applicants) submitted a route permit application to the Minnesota Public Utilities Commission (Commission) for a 345 kilovolt (kV) transmission line from an existing Monticello, Minnesota, substation into a new Quarry Substation located west of St. Cloud, Minnesota (Project). The proposed transmission line would be approximately 28 miles long, depending on the final route selection, and include construction of the new Quarry Substation and modification to the existing Monticello Substation. The application presented an Applicant Preferred route, two alternate routes, and two potential Quarry Substation locations (Figure 1-1a). The application was accepted as complete by the Commission on May 13, 2009.

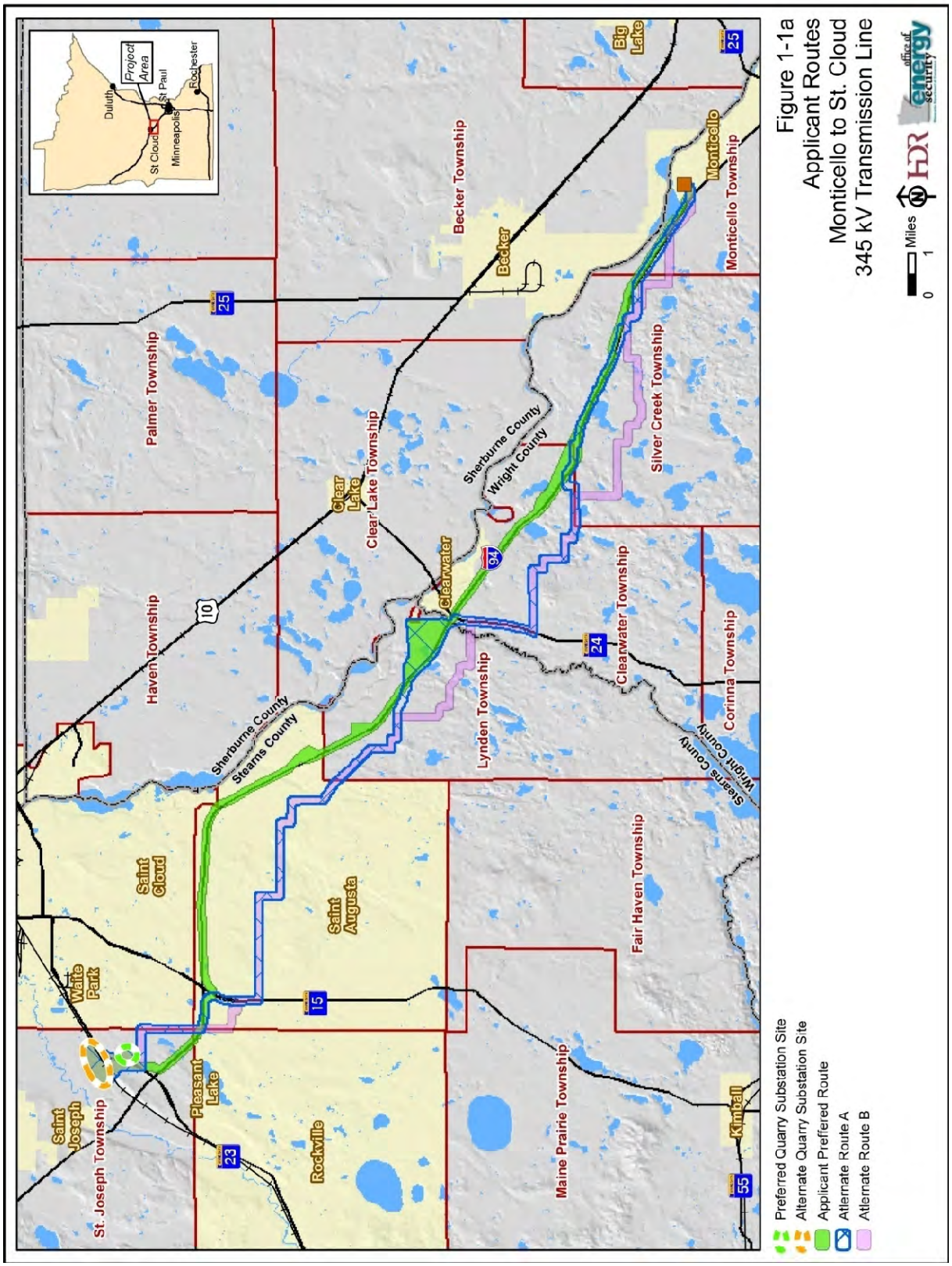
Route permit applications for high voltage transmission lines are subject to environmental review in accordance with Minnesota Rules 7850.1700 to 7850.2700 (full permitting process). Under the full permitting process the Commission has one year from the date the application was accepted as complete to make a decision on the route permit. As part of the decision making process, Office of Energy Security (OES) is required to develop an Environmental Impact Statement (EIS) that provides information about the extent of potential environmental impacts and how the potential impacts may be avoided or minimized.

EIS scoping is the first step in the permitting process after application acceptance. The scoping process has two primary purposes, to ensure that the public has a chance to participate in determining what routes and issues to study in the EIS, and to help focus the EIS on the most important issues surrounding the route permit decision. OES staff collected and reviewed comments on the scope of the EIS by holding two Scoping Meetings and convening an advisory task force (ATF). The ATF consisted of a 15 member committee which included five township officials, six city officials, two county officials, a program manager from the Federal Highway Administration (FHWA) and the Utilities Director form the Minnesota Department of Transportation (Mn/DOT). The ATF assisted in identifying impacts and route alternatives to be evaluated in the EIS prepared by OES Energy Facilities Permitting staff for the proposed Monticello to St. Cloud 345 kV Transmission Line Project. The OES also accepted written comments through July 24, 2009.

The ATF recommended four additional route alternatives and two alternate substation locations. The four ATF recommended routes were identified as Group 3 – Alternates 2 and 3, and Group 4 – Alternates 1 and 2 (Figure 1-1b). The two ATF recommended substation locations are Group 4 Substations 1 and 2. The OES reviewed the ATF routes and made the determination that the ATF recommended routes Group 3 – Alternates 2 and 3 and the ATF recommended substation Group 4 Substation 1 should be carried forward in the EIS for further evaluation, in addition to the Applicant proposed routes and substations. ATF recommended routes Group 4 Alternates 1 and 2, and the ATF recommended Group 4 Substation 2 were eliminated because they did not meet the Project purpose and need.

Table 1-1. Proposed Transmission Lines Routes and Substations

Routes	Substations
Permit Applicant Preferred and Alternate Routes	
Applicant Preferred Route Alternate Route A Applicant Route B	Quarry Substation Site 1 Quarry Substation Site 2
Additional Routes from Public Scoping	
ATF Group 3 Alternate Route 1 ATF Group 3 Alternate Route 2 ATF Group 3 Alternate Route 3 ATF Group 3 Alternate Route 4	ATF Group 4 Substation 1 ATF Group 4 Substation 2
Routes Carried Forward in the EIS	
Applicant Preferred Route Alternate Route A Applicant Route B ATF Group 3 Alternate Route 2 ATF Group 3 Alternate Route 3	Quarry Substation 1 Quarry Substation 2 ATF Group 4 Substation 1


Project Area
Duluth
St Cloud
Minneapolis
St Paul
Rochester
Figure 1-1a
Applicant Routes
Monticello to St. Cloud
345 kV Transmission Line
0 1 Miles
HDR
energy
office of security
Preferred Quarry Substation Site
Alternate Quarry Substation Site
Applicant Preffered Route
Alternate Route A
Alternate Route B
Saint Joseph Township
Saint Joseph
Waite Park
Saint Cloud
Saint Augusta
Pleasant Lake
Rockville
Maine Prairie Township
Fair Haven Township
Kimball
Haven Township
Palmer Township
Becker Township
Becker
Big Lake
Monticello
Monticello Township
Silver Creek Township
Clear Lake
Clear Lake Township
Clearwater
Clearwater Township
Lynden Township
Corinna Township
Sherburne County
Stearns County
Wright County
25
10
94
24
15
23
55

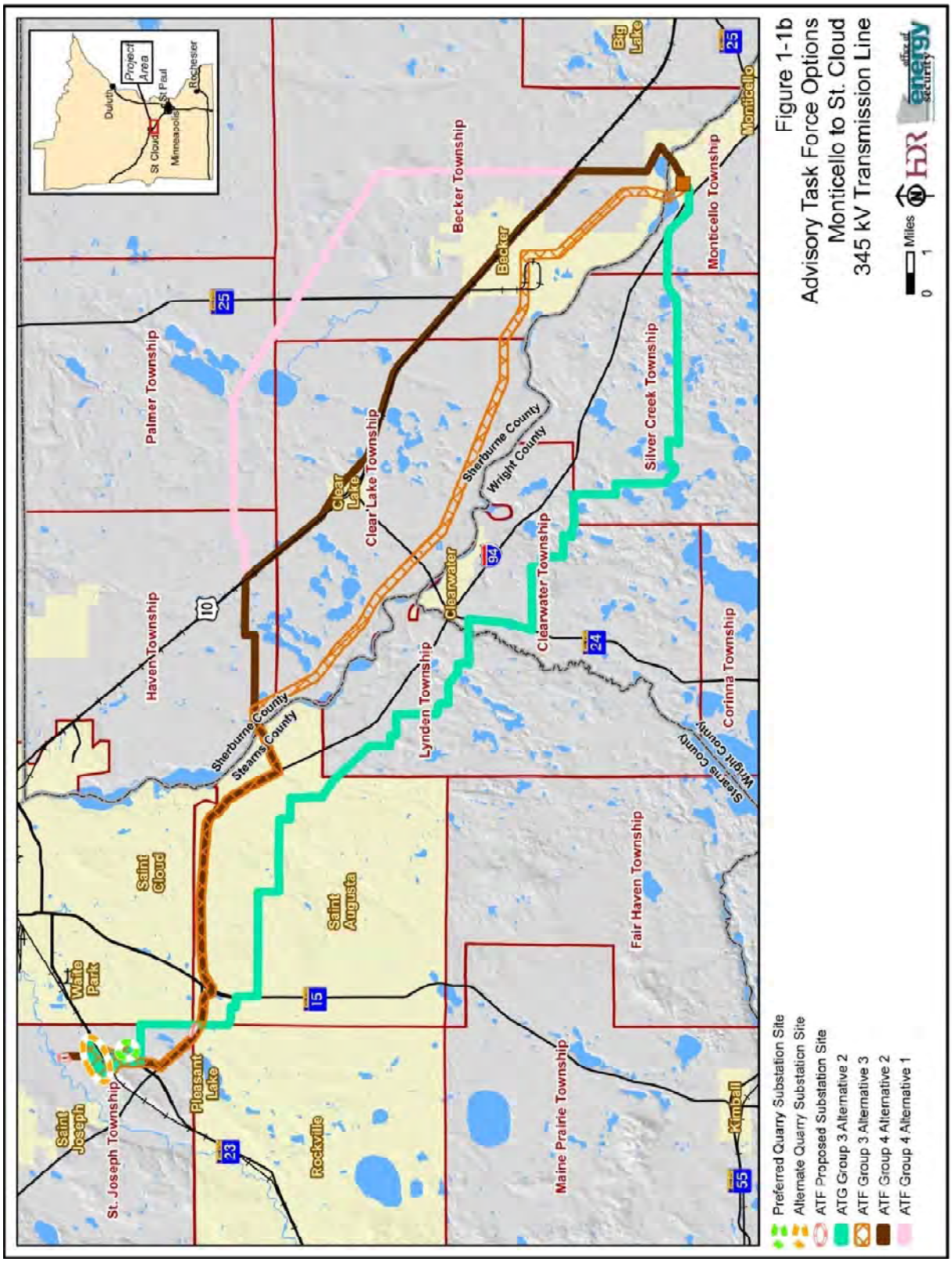


Figure 1-1b
Advisory Task Force Options
Monticello to St. Cloud
345 kV Transmission Line

A Scoping Decision Document was developed using comments submitted during the public notice period, comments documented through the public information meetings and issues raised through the ATF meetings. Further detail regarding the selection of the route alternatives and substation locations selected for inclusion in the EIS can be found in the Scoping Decision Document located in Appendix A. The OES has prepared this Draft EIS (DEIS) for the proposed Project, consistent with the EIS Scoping Decision which was signed by the Director of The Department of Commerce Office of Energy Security on October 9, 2009.

Once the DEIS is published, a comment period along with public information meetings will be held. After the close of the comment period, the OES staff will prepare a Final EIS (FEIS) based on public comments. The FEIS will include revisions to the draft as well as staff responses to comments on the DEIS.

A public hearing will also be held as a separate proceeding. The hearing will be conducted by an Administrative Law Judge (ALJ), who will ensure that the record created at the hearing is preserved and transmitted to the Commission. The ALJ will prepare a report that will include proposed findings of fact and conclusions, and a recommendation. A combined public hearing and evidentiary hearing will be held on March 8, 2010, at 2:00 p.m. and 7:00 p.m., at the Clearwater Township Hall, Clearwater, Minnesota, and will continue on March 9-12, 2010, as necessary.

After the FEIS is published and the ALJ issues the findings of fact, conclusion of law, and order with recommendations, the Commission makes a route permit decision. The date for the commission's decision will not be scheduled until the FEIS and ALJ report are issued.

1.1 PROJECT DESCRIPTION

The proposed Monticello to St. Cloud 345 kV Transmission Line Project would be approximately 28 miles long, extending between the existing Monticello Substation in Monticello, Minnesota and a new substation to be located west of St. Cloud, Minnesota in unincorporated Stearns County in St. Joseph and Rockville Townships. For the purpose of this document the proposed routes and substations would be defined by the nomenclature presented in Table 1-2 and as shown in Figure 1-1c.

Table 1-2. Proposed Transmission Lines Routes and Substations Titles

Transmission Line Routes Carried Forward in the EIS	
Titles prior to EIS	**Titles in EIS**
Applicant Preferred Route	Applicant Preferred Route
Alternate Route A	Route A
Applicant Route B	Route B
ATF Group 3 Alternate 2	Route C
ATF Group 3 Alternate 3	Route D
Substations Carried Forward in the EIS	
Titles prior to EIS	**Titles in EIS**
Quarry Substation 1	Quarry Substation Site 1
Quarry Substation 2	Quarry Substation Site 2
ATF Group 4 Substation 1	Quarry Substation Site 3 and the 115 kV route Interconnect.

The proposed structures would primarily include single-pole, double circuit capable, self-weathering or galvanized steel structures that would range in height between 130 and 175 feet. The span length between structures would typically range in length between 600 and 1,000 feet depending on site-specific considerations. Although the proposed line would be built using double circuit capable poles, only one circuit would be installed for this Project. The second position would be available for a future additional circuit. The ROW for the proposed 345 kV electrical transmission line would generally be 150 feet in width.

The Project also includes the construction of the Quarry Substation, modifications to the existing Monticello Substation, and the interconnection of the existing St. Cloud to Sauk River 115 kV transmission line into the new Quarry Substation. The specific Project facilities are as follows and include:

- Monticello Substation – Modifications would be made at the existing Monticello Substation to accommodate the proposed 345 kV transmission line. Equipment to be installed consists of 345 kV equipment which would include switches, control panels, circuit breakers, foundations and structures.

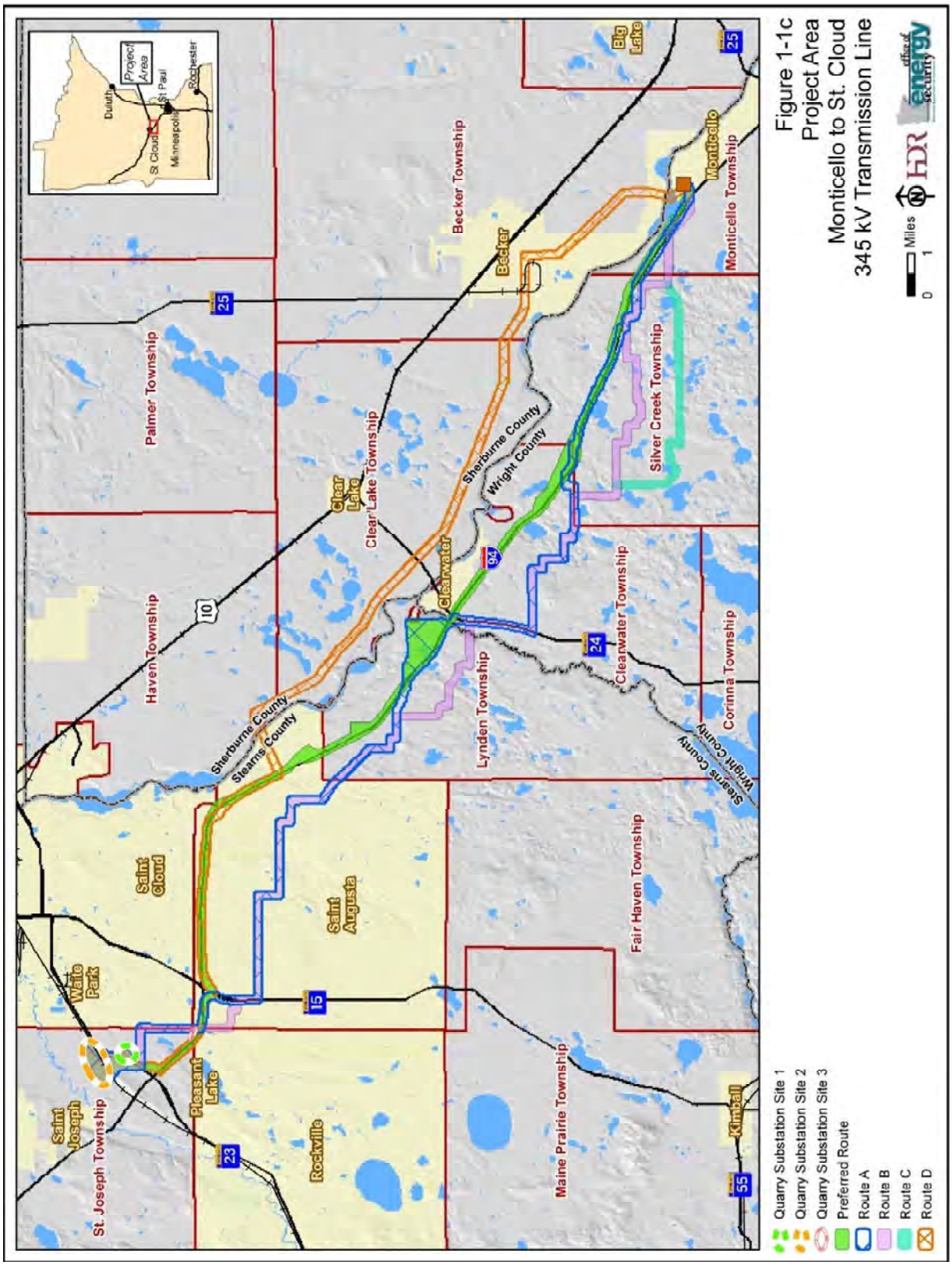


Figure 1-1c
Project Area
Monticello to St. Cloud
345 kV Transmission Line
Miles
0 1
Project Area
Duluth
St Paul
Rochester
Minneapolis
St Cloud
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
Preferred Route
Route A
Route B
Route C
Route D
Becker Township
Becker
Monticello
Monticello Township
Big Lake
Palmer Township
Clear Lake
Clear Lake Township
Sherburne County
Wright County
Silver Creek Township
Haven Township
Clearwater
Clearwater Township
Lynden Township
Corinna Township
Stearns County
Wright County
Saint Cloud
Saint Augusta
Fair Haven Township
Waite Park
Saint Joseph
St. Joseph Township
Pleasant Lake
Rockville
Maine Prairie Township
Kimball
25
10
94
24
15
23
55

- Monticello to St. Cloud 345 kV transmission line – The proposed line would be constructed primarily on single-pole, double circuit capable, self-weathering or galvanized steel structures. At this time, only one set of davit arms would be installed on the structures allowing current installation of a single circuit. The line would connect the existing Monticello Substation and the proposed Quarry Substation.
- Quarry Substation – The proposed Quarry Substation would be located west of the city of St. Cloud, Minnesota. The proposed 345/115 kV substation would be up to 15 acres in size to allow for the interconnection of the proposed 345 kV transmission line, an existing 115 kV transmission line, and future high voltage transmission lines.
- The existing St. Cloud to Sauk River 115 kV transmission line, located within the Proposed Quarry Substation Siting Areas and extending in an east-west to south-north direction, would be interconnected into the proposed Quarry Substation. The existing line enters the Proposed Quarry Substation Siting Areas from the east, extends west, and then diverges directly north. The existing 115 kV line may need to be extended to interconnect with the substation depending on substation site selection.
- Quarry Substation Site 3 - The proposed Quarry Substation Site 3 would cover approximately 13 total acres in the southeast corner of T124 R29 S36 and the northeast corner of T124 R29 S1 in Stearns County. The area is bounded to the north by County–State Aid Highway (CSAH) 6, to the east by the eastern boundary of T124 R29 S1 and to the south and west by I-94.

To make the Quarry Substation Site 3 a viable option, approximately an additional 3.5 miles of transmission line would need to be constructed. The additional transmission line would interconnect with the existing St. Cloud to Sauk River 115 kV transmission line described above. Figure 1-2 identifies the interconnect route.

1.2 PURPOSE OF THE TRANSMISSION LINE

The purpose of the Project is to address three needs: local community reliability; regional reliability and generation outlet support. The demand for electric power in the St. Cloud area has exceeded the capability of the area's electrical system to reliably provide power during contingencies. The Project would provide sufficient additional capacity to meet the St. Cloud area's needs until approximately 2035 to 2040. The proposed 345 kV transmission line would also help improve the reliability of the bulk electric system serving Minnesota and portions of neighboring states. Finally, the Project provides a necessary 345 kV connection to the Twin Cities that would help facilitate additional generation development, including renewable generation, in eastern North Dakota and western Minnesota.

1.3 PROJECT LOCATION

The proposed Project is located between the city of Monticello in Wright County and St. Joseph Township in Stearns County, Minnesota.

Project routes may be located in the following cities: Clearwater, Monticello, St. Augusta, St. Cloud, Rockville, Waite Park, Becker, Clear Lake and Haven. The potentially affected townships are listed in Table 1-3 through Table 1-10 below.

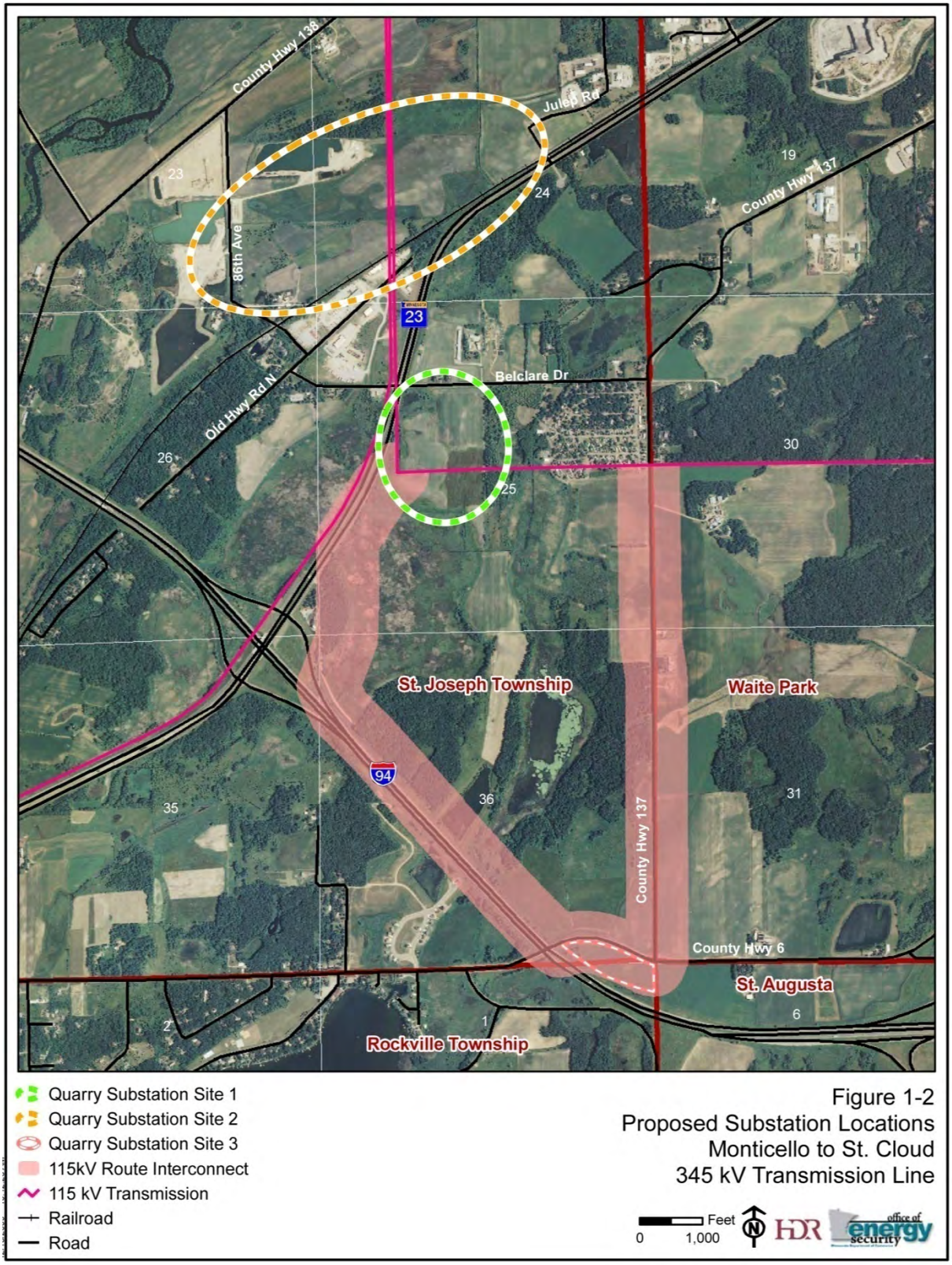

County Hwy 138
Julep Rd
19
County Hwy 137
23
24
86th Ave
23
Belclare Dr
Old Hwy Rd N
26
30
25
St. Joseph Township
Waite Park
94
36
31
35
County Hwy 137
County Hwy 6
St. Augusta
6
2
1
Rockville Township
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
115kV Route Interconnect
115 kV Transmission
Railroad
Road
Figure 1-2
Proposed Substation Locations
Monticello to St. Cloud
345 kV Transmission Line
Feet
0
1,000
N
HDR
office of energy security

Table 1-3. Applicant Preferred Route Parcel Description

Township	Township & Range	Sections
Monticello/Silver Creek	T122, R25	30-33
Silver Creek/Clearwater	T122, R26	7, 16-18, 20-23, 25-27
Clearwater/Lynden	T122, R27	1-3, 11-12
Lynden/St. Augusta	T123, R27	7, 18-20, 27-29, 33-34
St. Augusta/Rockville	T123, R28	1-6, 12
Rockville/St. Joseph	R123, R29	1
St. Joseph	R124, R29	23-26, 35-36

Table 1-4. Route A Parcel Description

Townships	Township & Range	Sections
Monticello/Silver Creek	T122, R25	30-33
Silver Creek/Clearwater	T122, R26	16-23, 25-27
Clearwater/Lynden	T122, R27	3, 10-15, 24
Lynden/St. Augusta	T123, R27	19, 27-28, 30, 33-34
St. Augusta/Rockville	T123, R28	6-15, 24
Rockville/St. Joseph	T123, R29	1
Waite Park	T124, R28	30-31
St. Joseph	T124, R29	23-26, 36

Table 1-5. Route B Parcel Description

Townships	Township & Range	Sections
Monticello/Silver Creek	T122, R25	31-33
Silver Creek/Clearwater	T122, R26	18-21, 25-30, 36
Clearwater/Lynden	T122, R27	3-5, 10-15, 24
Lynden/St. Augusta	T123, R27	19, 29-30, 32-33
St. Augusta/Rockville	T123, R28	6-15, 24
Rockville/St. Joseph	T123, R29	1
Waite Park	T124, R28	30-31
St. Joseph	T124, R29	23-26, 36

Table 1-6. Route C Parcel Description

Townships	Township & Range	Sections
Monticello/Silver Creek	T122, R25	31-33
Silver Creek/Clearwater	T122, R26	18-20, 29-36
Clearwater/Lynden	T122, R27	3-5, 10-15, 24
Lynden/St. Augusta	T123, R27	19, 29-30, 32-33
St. Augusta/Rockville	T123, R28	6-15, 24
Rockville/St. Joseph	T123, R29	1
Waite Park	T124, R28	30-31
St. Joseph	T124, R29	23-26, 36

Table 1-7. Route D Parcel Description

Townships	Township & Range	Sections
	T33, R28	6-8, 17-18, 20
	T33, R29	1-2
	T34, R28	31
	T34, R29	38-30, 32-36
	T34, R30	4-5, 8-10, 14-15, 23-25
	T35, R30	31-32
	T122, R25	32-33
	T123, R27	7-8, 18
St. Augusta	T123, R28	1-6, 12
Rockville	T123, R29	1
St. Joseph	T124, R29	23-26, 35-36

Table 1-8. Quarry Substation Site 1 Parcel Description

Townships	Township & Range	Sections
St. Joseph	T124, R29	25

Table 1-9. Quarry Substation Site 2 Parcel Description

Townships	Township & Range	Sections
St. Joseph	T124, R29	23-26

Table 1-10. Quarry Substation Site 3 Parcel Description

Townships	Township & Range	Sections
Rockville	T123, R29	1
St. Joseph	T124, R29	36

1.4 ROUTE DESCRIPTION

The following section provides a brief description of each of the five proposed route locations and the three proposed substation locations. This section also describes the route widths and right of way options evaluated in the EIS.

1.4.1 Applicant Preferred Route

The Applicant Preferred Route, identified on Figure 1-3, is approximately 28 miles in length and is located on the South Side of the Mississippi River. After exiting the Monticello Substation the Applicant Preferred Route would run in a northwesterly direction for approximately 12 miles through Monticello, Silver Creek, Clearwater and Lynden townships in Wright County. The route veers slightly north for approximately four miles and enters into the St Cloud city limits. The route then turns straight west for approximately four miles and then turns north. The route would terminate one of the Quarry Substation Sites. For a detailed description of this route, please see Appendix B.

1.4.2 Route A

Route A, identified on Figure 1-4, is approximately 32 miles in length and is located on the South Side of the Mississippi River. After exiting the Monticello Substation this route would also travel in a northwesterly direction taking several turns, through Monticello, Silver Creek, Clearwater and Lynden townships in Wright County, for approximately 26 miles. The route enters into the St Cloud city limits and travels in a slightly north west direction taking several turns for approximately four miles. This route would terminate at one of the Quarry Substation Sites. For a detailed description of this route please see Appendix B.

1.4.3 Route B

Route B, identified on Figure 1-5 is approximately 35 miles in length and is located on the South Side of the Mississippi River. After exiting the Monticello Substation this route would also travel in a northwesterly direction taking several turns (in some areas paralleling Route A), through Monticello, Silver Creek, Clearwater and Lynden townships in Wright County, for approximately 28 miles. The route enters into the St Cloud city limits and travels in a slightly north west direction taking several turns for approximately four miles. This route would terminate at either of the Substation Sites. For a detailed description of this route please see Appendix B.

1.4.4 Route C

Route C, identified on Figure 1-6, is approximately 30 miles in length and is located on the South Side of the Mississippi River. After exiting the Monticello Substation this route parallels Route B for approximately one mile. The route travels west for approximately 4 miles and then turns north for about 2.5 miles. The route then parallels Route B in a northwesterly direction taking several turns and jogs (in some areas paralleling Route A), through Monticello, Silver Creek, Clearwater and Lynden townships in Wright County, for approximately 18.5 miles. The route enters into the St Cloud city limits and travels in a slightly north west direction taking several turns for approximately 4 miles. This route would terminate at either of the Substation Sites. For a detailed description of this route please see Appendix B.

1.4.5 Route D

Route D is approximately 30 miles in length and is located on the north side of the Mississippi River (Figure 1-7). After exiting the Monticello Substation this route would travel north for approximately one mile crossing the Mississippi River. The route would travel in a northwesterly direction for approximately 20 miles crossing Becker, Clear Lake and Haven townships in Sherburne County. The route would then travel in a southwesterly direction crossing back over the river for one mile where it enters the St Cloud City Limits. The route then turns in a northwest direction for two miles and heads straight west for another three miles. The route then travels in a northwest direction for approximately two miles, and then turns north for approximately one mile. This route would terminate at either of the Substation Sites. For a detailed description of this route please see Appendix B.

1.4.6 Quarry Substation Site 1

The Quarry Substation Site 1 is located along the east side of State Highway 23 approximately 0.5 miles northeast of the I-94 and Highway 23 interchange (Figure 1-2). Up to 40 acres would be acquired for the proposed Quarry Substation, including buffer.

1.4.7 Quarry Substation Site 2

The Quarry Substation Site 2 is located along the north side of State Highway 23 approximately one mile northwest of the I-94 and Highway 23 interchange (see Figure 1-2). The approximate acres acquired for Quarry Substation site 2 would be 15.

1.4.8 Quarry Substation Site 3

Quarry Substation Site 3 covers approximately 15 total acres in the southeast corner of T124 R29 S36 and the northeast corner of T124 R29 S1 in Stearns County (see Figure 1-2). The area is bounded to the north by CSAH 6, to the east by the eastern boundary of T124 R29 S1 and to the south and west by I-94. As mentioned previously, Quarry Substation Site 3 would require construction of a new 115kV transmission line to connect to the existing St. Cloud to Sauk River 115kV line. The proposed new connecting transmission line route is referred to as the 115 kV Interconnect route.

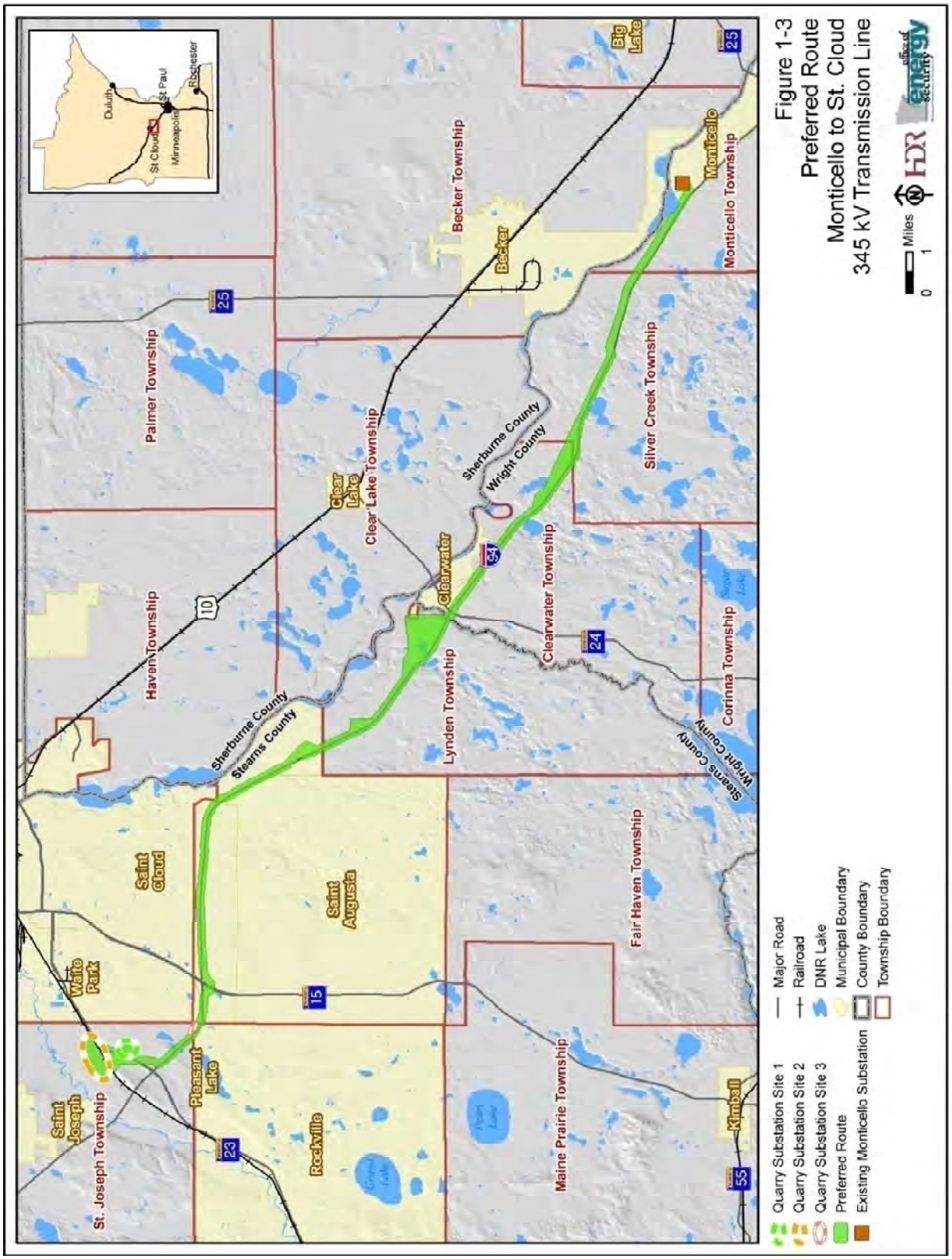
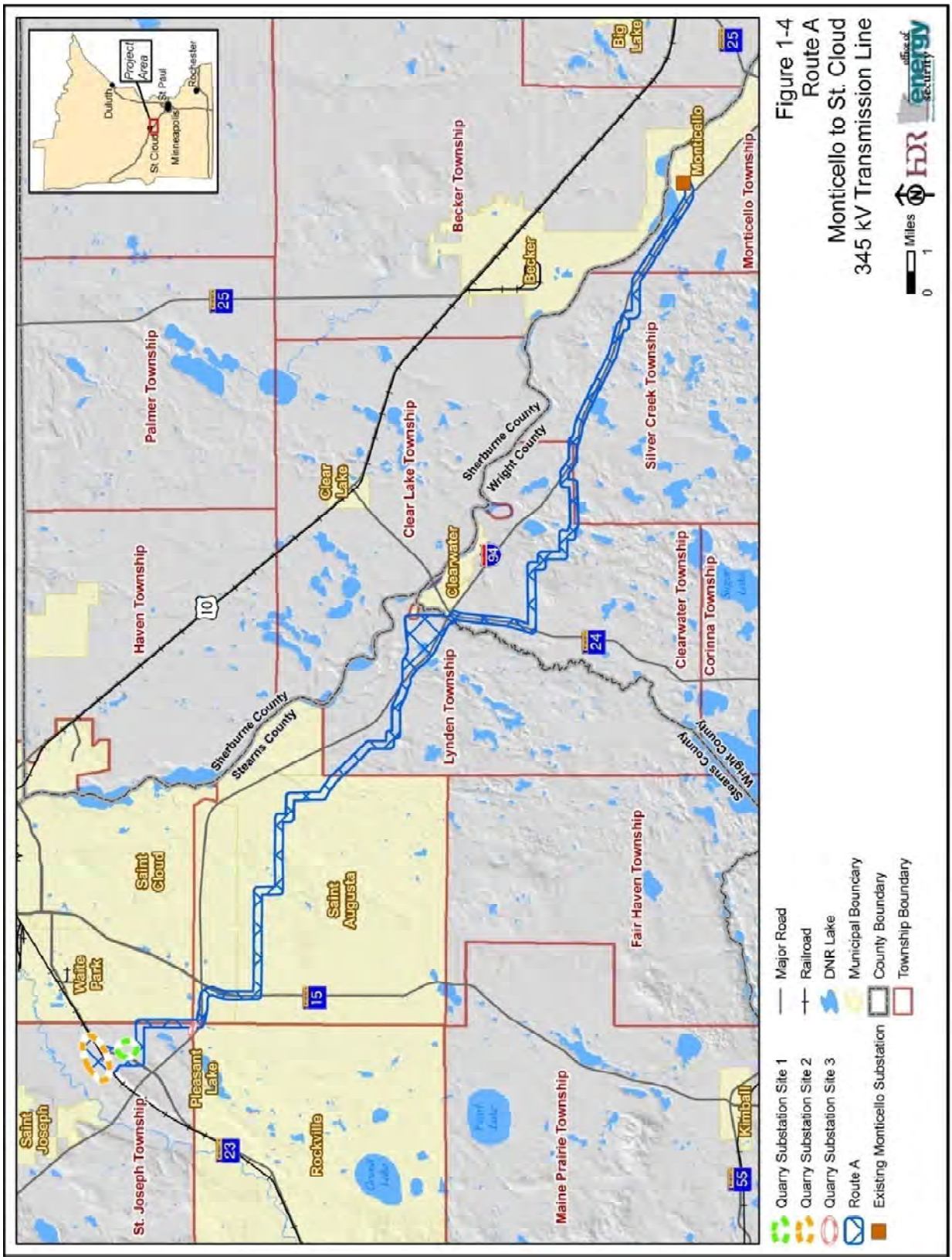
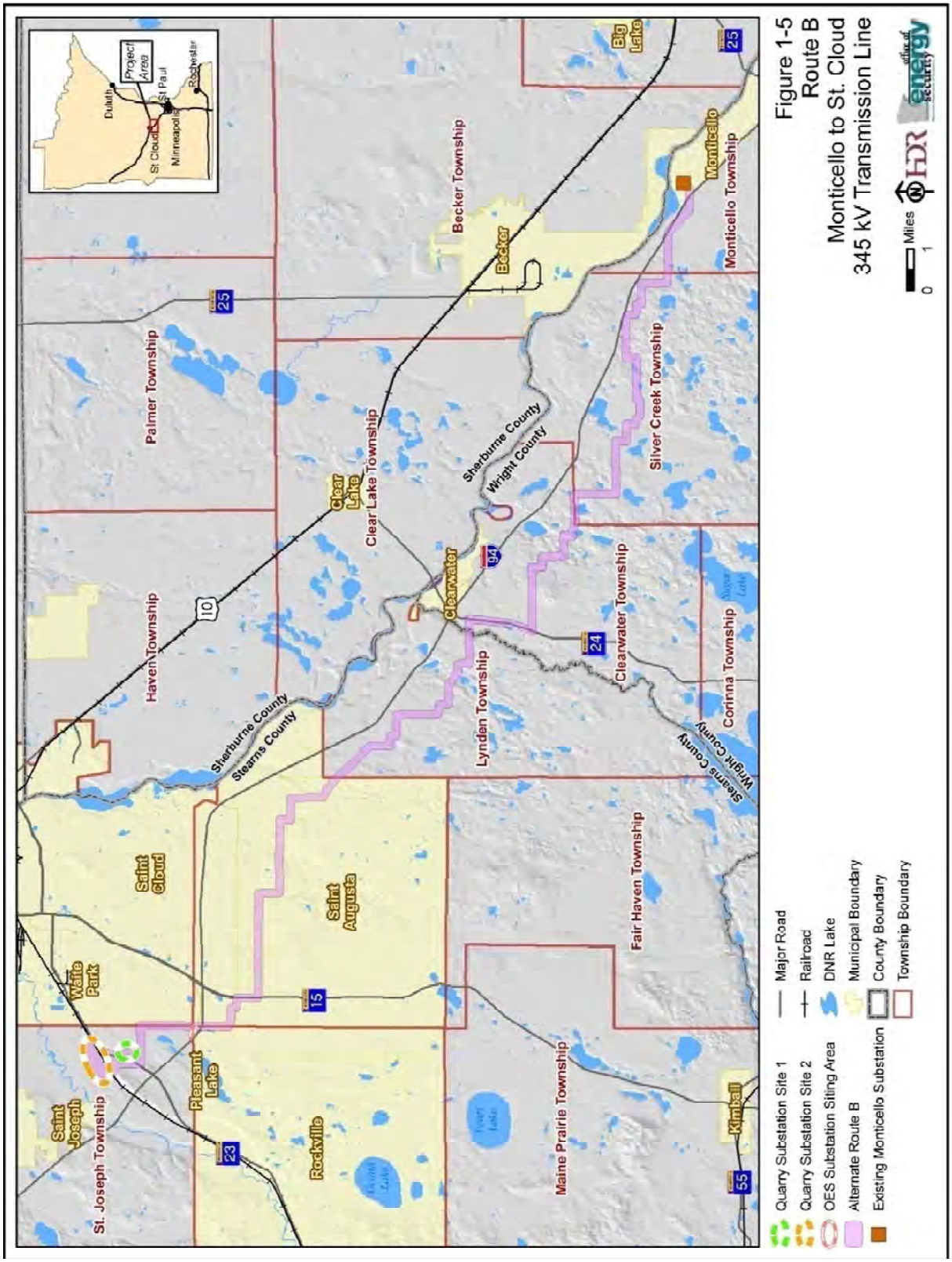
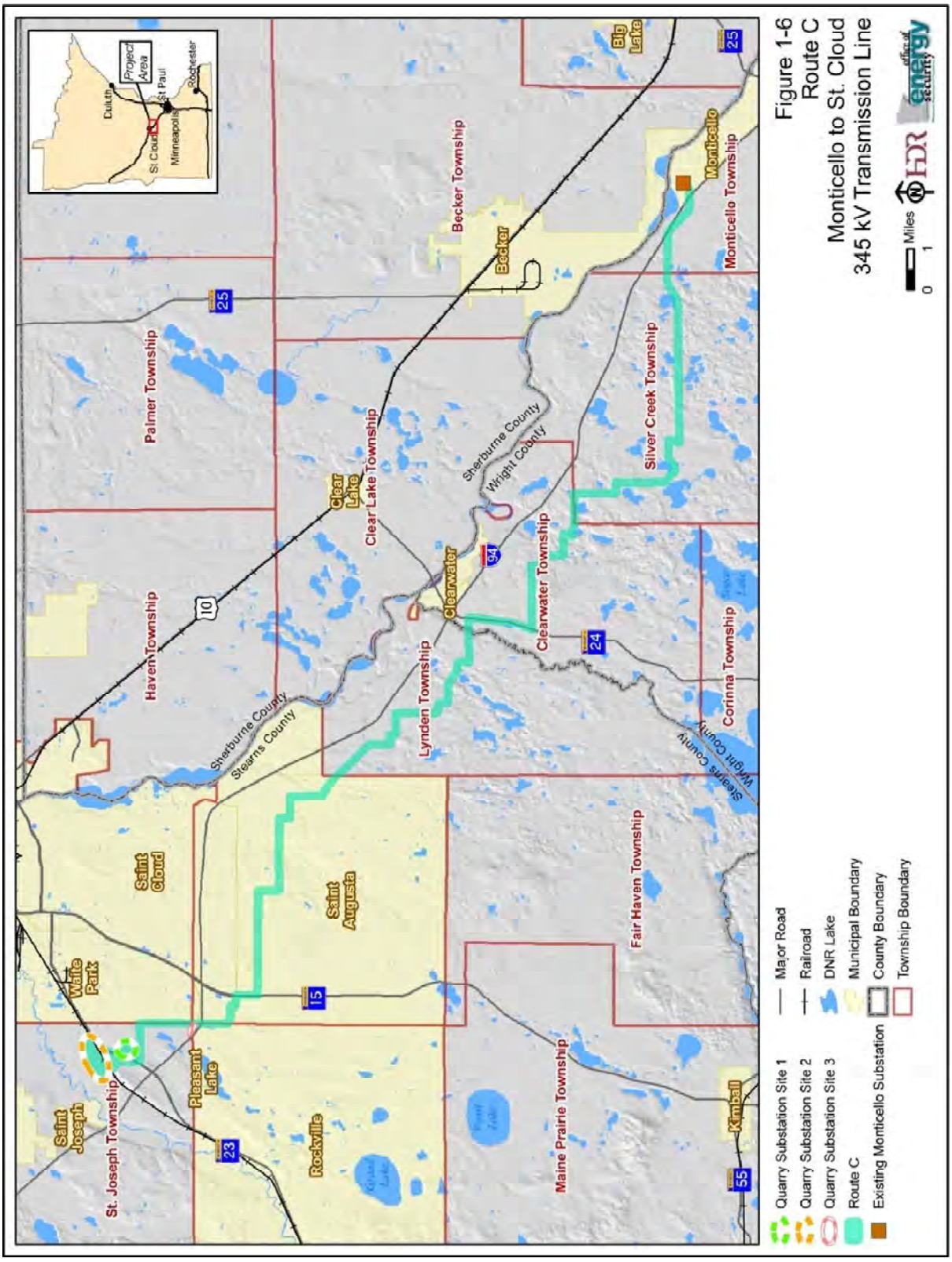


Figure 1-3
Preferred Route
Monticello to St. Cloud
345 kV Transmission Line
Miles
0
1
Duluth
St Cloud
Minneapolis
St Paul
Rochester
Big Lake
Becker Township
Becker
Monticello
Monticello Township
Palmer Township
Silver Creek Township
Clear Lake
Clear Lake Township
Sherburne County
Wright County
Clearwater
Clearwater Township
Haven Township
Lynden Township
Corinna Township
Sherburne County
Stearns County
Stearns County
Wright County
Saint Cloud
Saint Augusta
Fair Haven Township
Waite Park
Saint Joseph
St. Joseph Township
Pleasant Lake
Rockville
Maine Prairie Township
Kimball
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
Preferred Route
Existing Monticello Substation
Major Road
Railroad
DNR Lake
Municipal Boundary
County Boundary
Township Boundary


Project Area
Duluth
St Paul
Rochester
St Cloud
Minneapolis
Big Lake
Becker Township
Becker
Monticello
Monticello Township
Palmer Township
Clear Lake
Clear Lake Township
Sherburne County
Wright County
Silver Creek Township
Haven Township
Clearwater
Clearwater Township
Corinna Township
Lynden Township
Stearns County
Wright County
Saint Cloud
Saint Augusta
Fair Haven Township
Waite Park
Saint Joseph
Pleasant Lake
St. Joseph Township
Rockville
Maine Prairie Township
Kimball
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
Route A
Existing Monticello Substation
Major Road
Railroad
DNR Lake
Municipal Boundary
County Boundary
Township Boundary
Miles
0
1
Figure 1-4
Route A
Monticello to St. Cloud
345 kV Transmission Line
HDR
energy security


Project Area
Duluth
St Paul
Rochester
Minneapolis
St Cloud
Figure 1-5
Route B
Monticello to St. Cloud
345 kV Transmission Line
Miles
0
1
HDR
energy
Major Road
Railroad
DNR Lake
Municipal Boundary
County Boundary
Township Boundary
Quarry Substation Site 1
Quarry Substation Site 2
OES Substation Siting Area
Alternate Route B
Existing Monticello Substation
Palmer Township
Haven Township
Becker Township
Clear Lake Township
Silver Creek Township
Monticello Township
Clearwater Township
Lynden Township
Corinna Township
Fair Haven Township
Maine Prairie Township
St. Joseph Township
Saint Joseph
Saint Cloud
Saint Augusta
Waite Park
Pleasant Lake
Rockville
Kimball
Big Lake
Becker
Monticello
Clear Lake
Clearwater
Sherburne County
Wright County
Stearns County
25
10
94
24
15
23
55


Project Area
Duluth
St Paul
Rochester
St Cloud
Minneapolis
Figure 1-6
Route C
Monticello to St. Cloud
345 kV Transmission Line
Miles
0
1
HDR
energy
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
Route C
Existing Monticello Substation
Major Road
Railroad
DNR Lake
Municipal Boundary
County Boundary
Township Boundary
Palmer Township
Haven Township
Becker Township
Becker
Big Lake
Monticello
Monticello Township
Silver Creek Township
Clear Lake
Clear Lake Township
Sherburne County
Wright County
Clearwater
Clearwater Township
Lynden Township
Corinna Township
Stearns County
Saint Cloud
Saint Augusta
Waite Park
Saint Joseph
St. Joseph Township
Pleasant Lake
Rockville
Fair Haven Township
Maine Prairie Township
Kimball
10
15
23
24
25
55
94

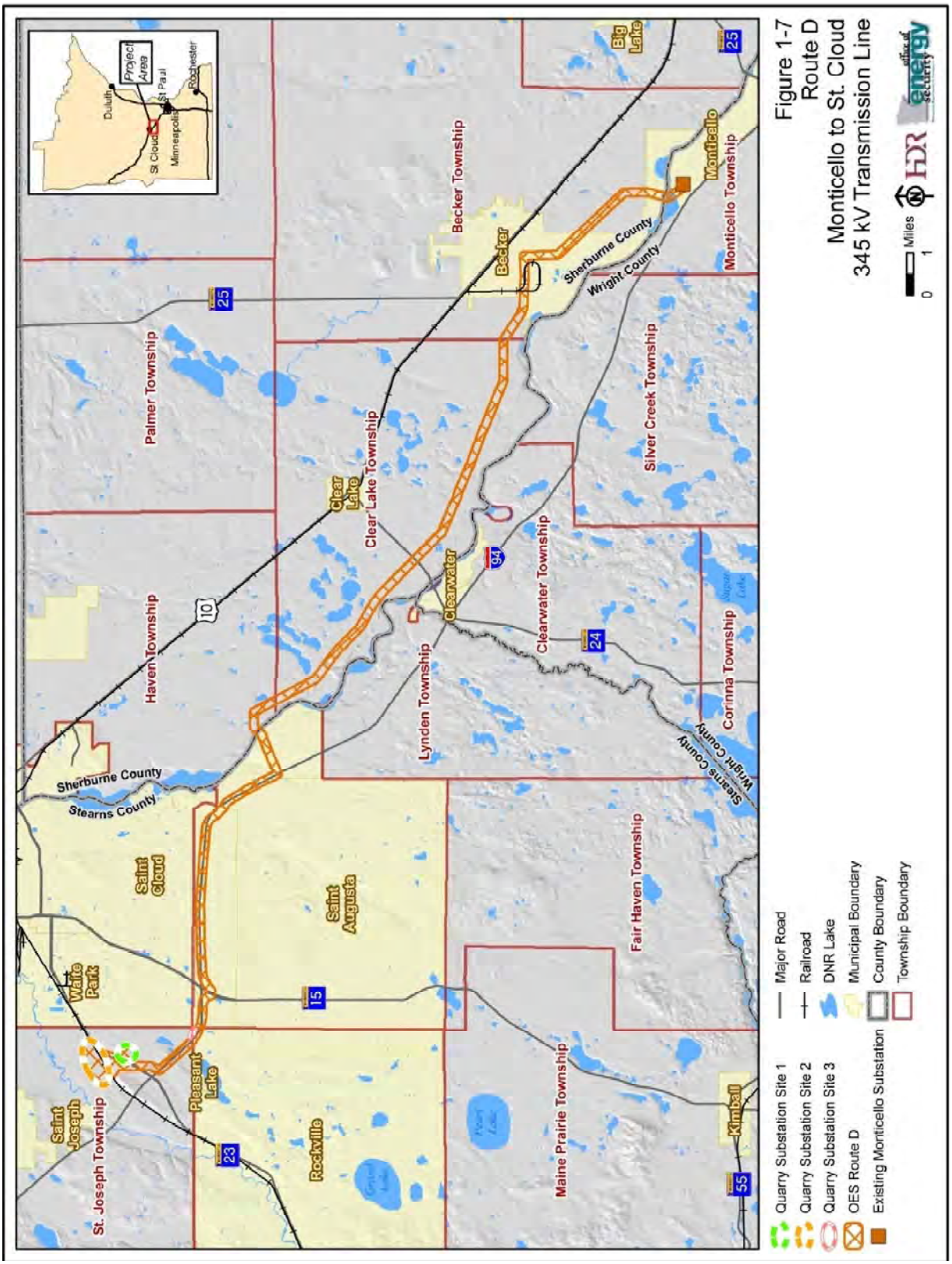


Figure 1-7
Route D
Monticello to St. Cloud
345 kV Transmission Line
Miles
0 1
HDR
energy
Project Area
Duluth
St Cloud
Minneapolis
St Paul
Rochester
Big Lake
Becker Township
Becker
Monticello
Monticello Township
Sherburne County
Wright County
Palmer Township
Silver Creek Township
Clear Lake
Clear Lake Township
Haven Township
Clearwater
Clearwater Township
Lynden Township
Corinna Township
Stearns County
Wright County
Sherburne County
Stearns County
Saint Cloud
Saint Augusta
Fair Haven Township
Waite Park
Pleasant Lake
Saint Joseph
St. Joseph Township
Rockville
Maine Prairie Township
Kimball
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
OES Route D
Existing Monticello Substation
Major Road
Railroad
DNR Lake
Municipal Boundary
County Boundary
Township Boundary

1.5 ROUTE WIDTH

For this Project, Applicants propose a route approximately 1,000 feet in width for the majority of the Project. Roads, property boundaries, fence lines, and other alignment opportunities typically are found in 0.25-mile intervals in the land use settings in the Project area. Human settlement in rural areas also tends to have a similar 0.25-mile pattern. By narrowing the route to less than 0.25 miles in width, the intended feature that would be paralleled and associated land use features are more discernible.

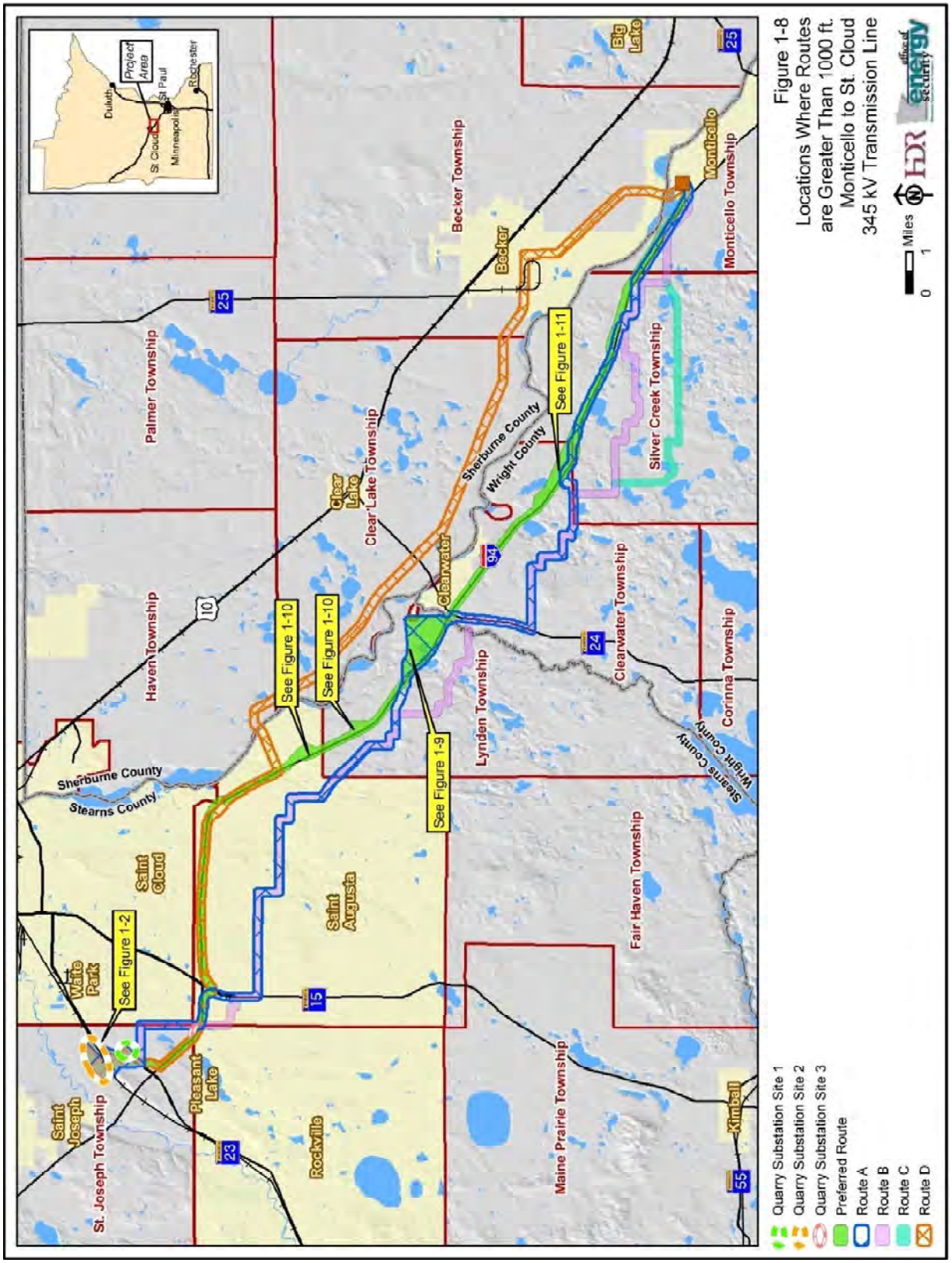
In order to take advantage of the presence of existing linear infrastructure and associated right-of-way, the Applicant proposes to parallel the I-94 corridor for segments of the Applicant Preferred Route, Route A, Route D and the 115 kV Interconnect Route. The proposed Route D parallels the I-94 corridor, but will not be occupying any of the I-94 corridor ROW.

To address the potential for conflicts with occupancy of I-94 right of way, the Applicant specifically identified three alignment options below for the Applicant Preferred Route, Route A and the115 kV Interconnect route:

- Maximum ROW Occupancy (alignment centerline generally 5 feet outside the edge of I-94 right of way)
- Limited ROW Occupancy (alignment centerline generally 25 feet outside the edge of I-94 right of way)
- No ROW Occupancy (alignment centerline generally 75 feet outside the edge of I-94 right of way)

For Route D, the applicants considered a centerline alignment option that would require combining the existing 115-kV line with the proposed new 345-kV line in a multiple circuit configuration using new structures. However, after further evaluation of the reliability of this configuration and the impacts to line maintenance, the Applicant indicated that an alignment adjacent to the existing 150 foot 115-kV ROW would be preferable. According to the Applicant, a multiple circuit configuration would create maintenance inefficiencies and reduce transmission redundancy.

Applicants also request a route that is wider than a 1,000 feet but less than 1.25 miles in width in four specific areas along the Proposed Routes (Figure 1-8). The widest route segment of the routes occurs in the Clearwater area and is 1.25 miles in width. Both the Applicant Preferred route and Route A would travel through this area. The Applicant states that larger widths will allow for flexibility for structure placement near the I-94 ROW. In the event that Applicants are unable to place transmission structures less than 75 feet from the I-94 ROW, the Applicant is proposing a 345 kV transmission line alignment that is further away from the I-94 ROW to avoid displacement of homes. The Applicant also requested a route of 1.25 miles in width in the Quarry Substation areas to allow for flexibility in designing and constructing the substation interconnect. Figures 1-8 through 1-11 provide a detailed look at each of the larger widths within the transmission line routes.


Project Area
Duluth
St Paul
Rochester
St Cloud
Minneapolis
Big Lake
Becker Township
Becker
Monticello
Monticello Township
Palmer Township
Silver Creek Township
Clear Lake
Clear Lake Township
Sherburne County
Wright County
Clearwater
Haven Township
Clearwater Township
Lynden Township
Corinna Township
Wright County
Stearns County
Saint Cloud
Saint Augusta
Fair Haven Township
Waite Park
Saint Joseph
St. Joseph Township
Pleasant Lake
Rockville
Maine Prairie Township
Kimball
See Figure 1-2
See Figure 1-9
See Figure 1-10
See Figure 1-10
See Figure 1-11
Figure 1-8
Locations Where Routes are Greater Than 1000 ft.
Monticello to St. Cloud
345 kV Transmission Line
Miles
0 1
Quarry Substation Site 1
Quarry Substation Site 2
Quarry Substation Site 3
Preferred Route
Route A
Route B
Route C
Route D

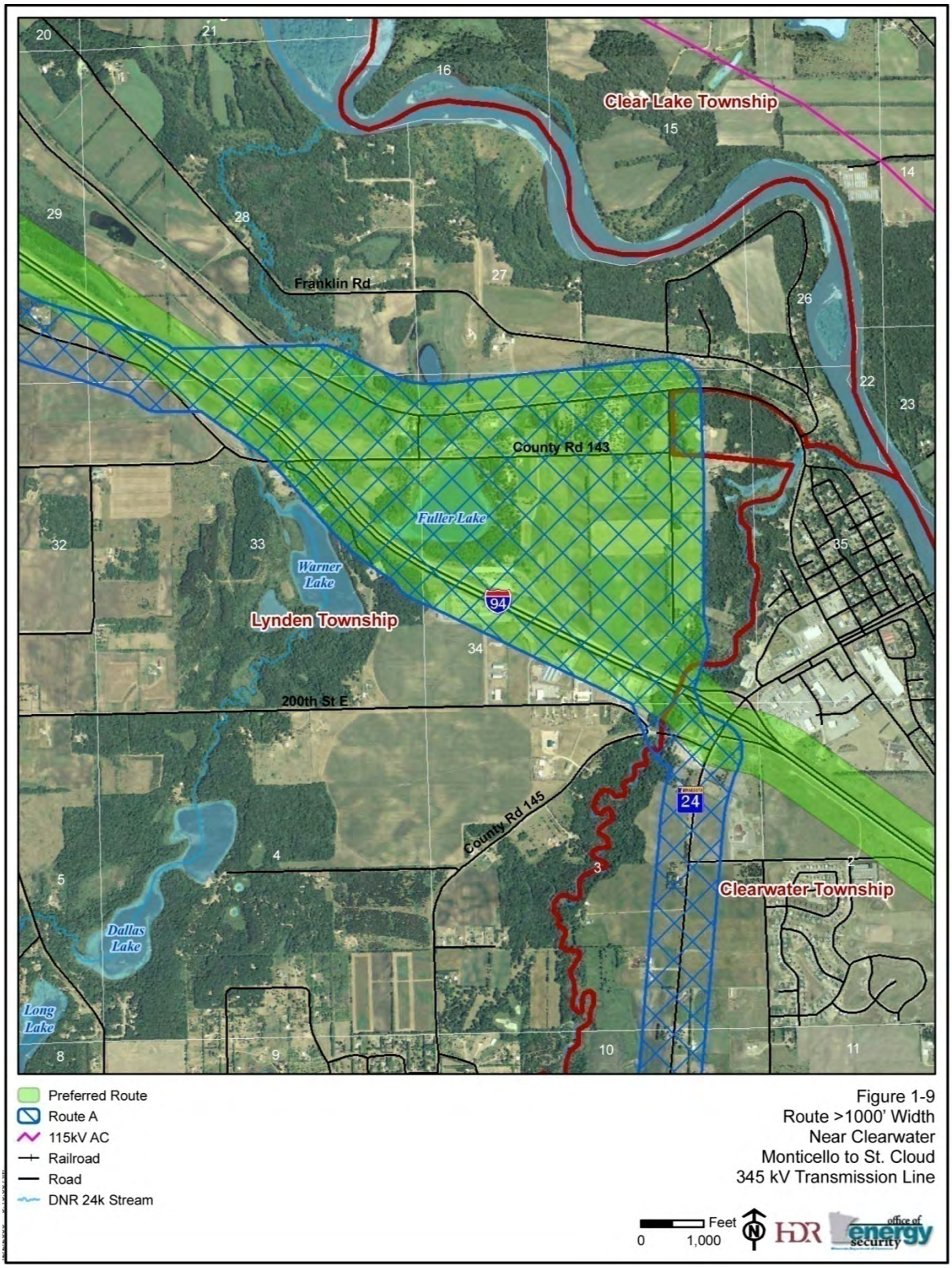


Figure 1-9
Route >1000' Width
Near Clearwater
Monticello to St. Cloud
345 kV Transmission Line

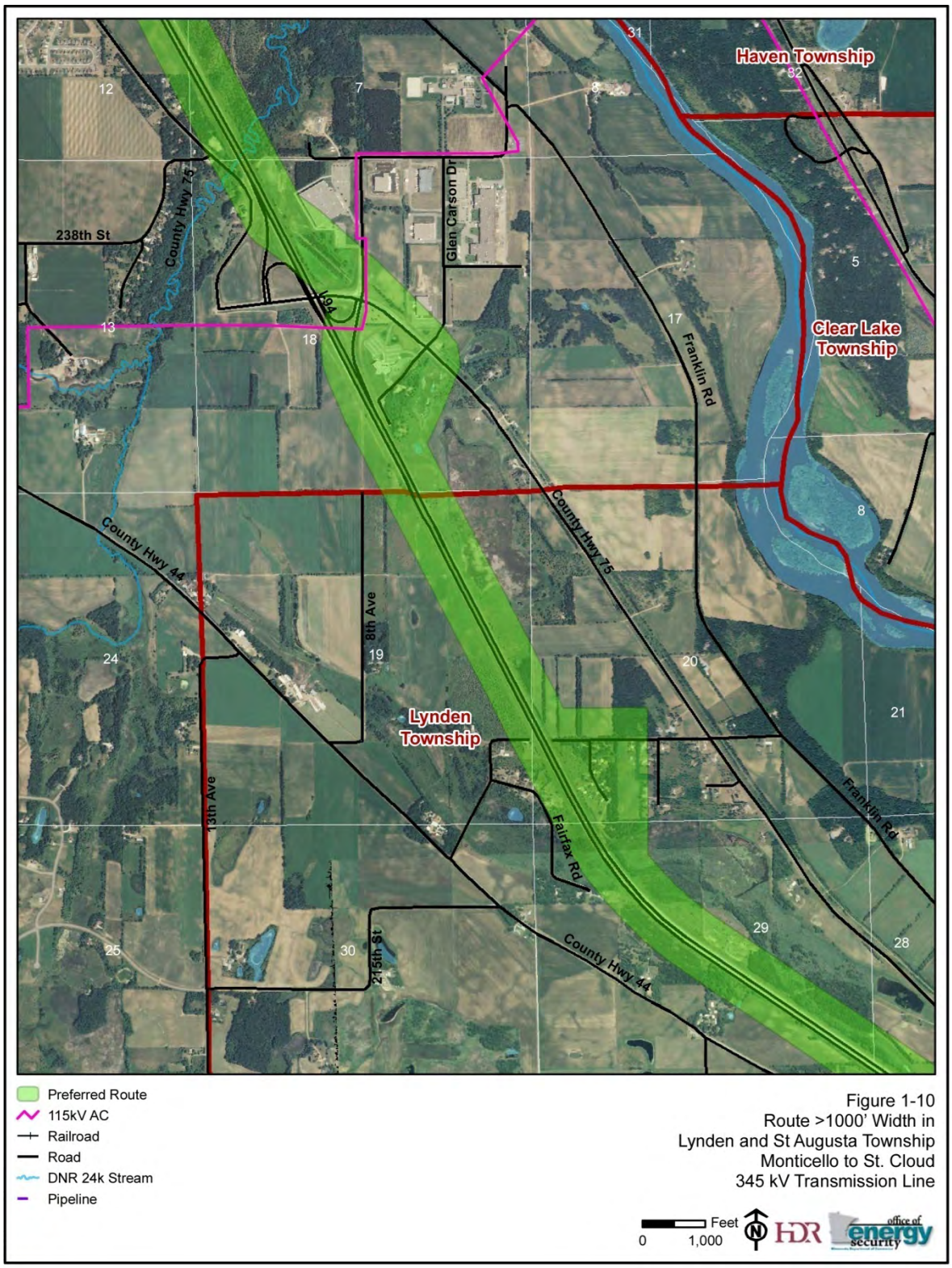
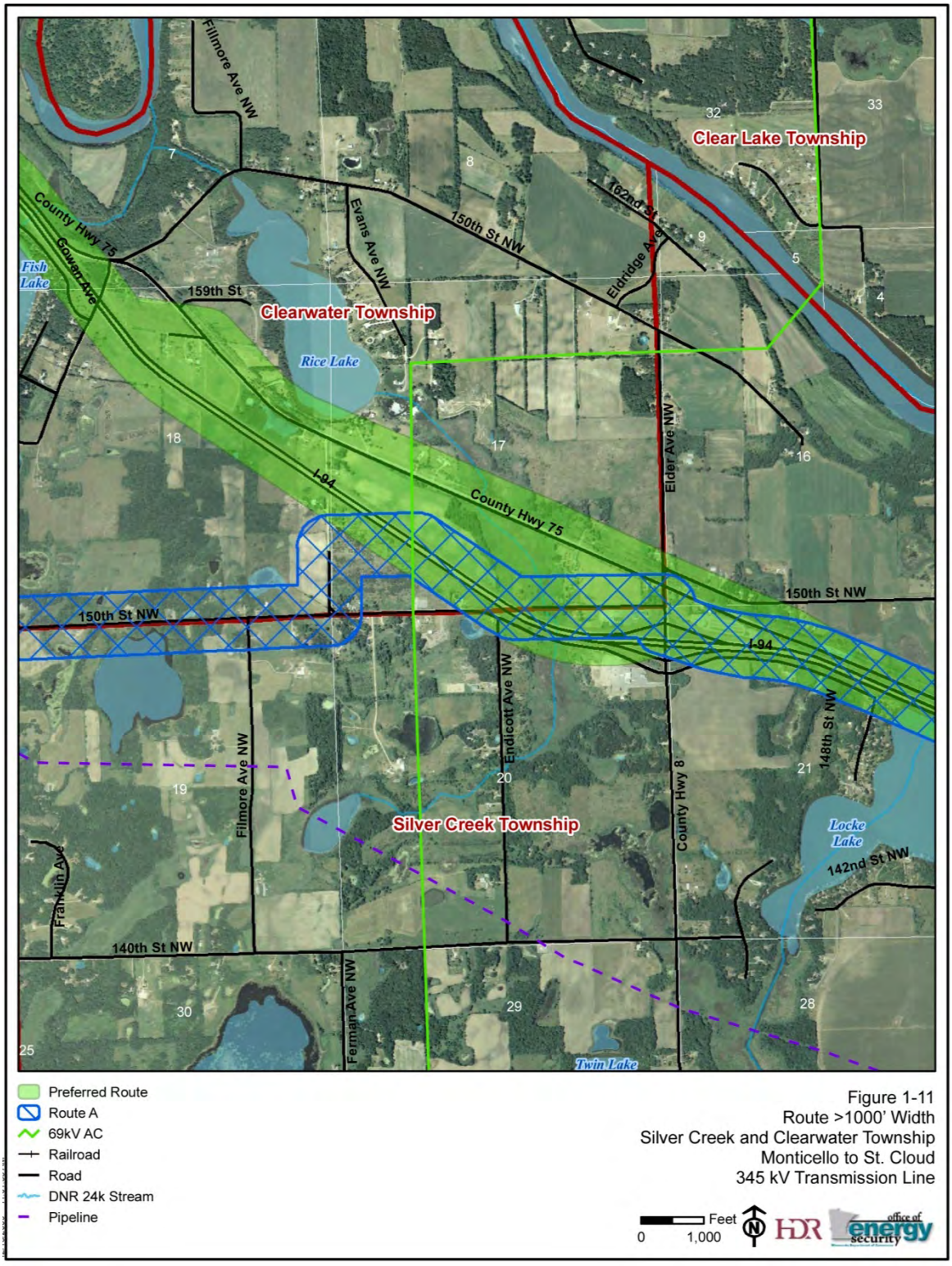
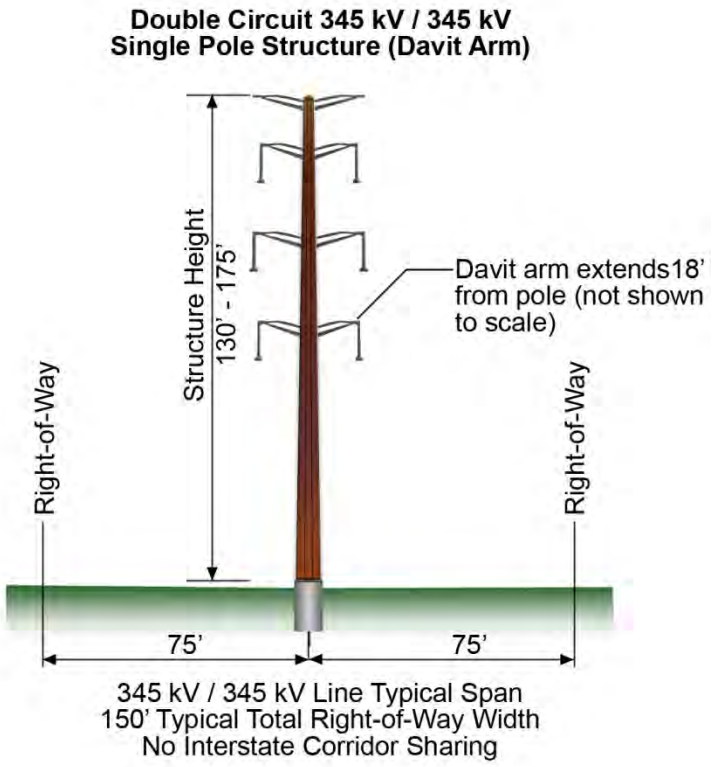


Figure 1-10
Route >1000' Width in
Lynden and St Augusta Township
Monticello to St. Cloud
345 kV Transmission Line


Clear Lake Township
Clearwater Township
Silver Creek Township
Fillmore Ave NW
Evans Ave NW
Eldridge Ave
Elder Ave NW
Endicott Ave NW
Filmore Ave NW
Franklin Ave
Ferman Ave NW
County Hwy 8
148th St NW
142nd St NW
140th St NW
150th St NW
159th St
162nd St
County Hwy 75
Gowen Ave
I-94
Fish Lake
Rice Lake
Locke Lake
Twin Lake
7
8
9
4
5
16
17
18
19
20
21
25
28
29
30
32
33
Preferred Route
Route A
69kV AC
Railroad
Road
DNR 24k Stream
Pipeline
Figure 1-11
Route >1000' Width
Silver Creek and Clearwater Township
Monticello to St. Cloud
345 kV Transmission Line
Feet
0
1,000
N
HDR
office of energy security

The proposed 345 kV transmission line would be built primarily with single pole structures, which typically require a ROW 150 feet in width for the length of the transmission line. In some limited instances, where specialty structures are required for long spans or in environmentally sensitive areas, up to 180 feet of ROW may be needed. When the transmission line is placed cross-country across private land, an easement for the entire 150 foot ROW would be acquired from the affected landowner(s). Applicants propose to locate the poles as close to property division lines as reasonably possible. A illustration of a structure with associated ROW limits is shown in Diagram 1-1.

Diagram 1-1. Double Circuit 345 kV Structure with ROW



Source: HDR, 2009

When the transmission line parallels other existing infrastructure ROW (e.g., roads, railroads, other utilities), an easement of lesser width may be possible as parts of the ROW of the existing infrastructure can often be combined with the ROW needed for the transmission line. When paralleling existing ROW, Applicants' typical practice is to place the poles on adjacent private property a few feet off the existing ROW, unless the adjacent ROW is used by another transmission line where a larger buffer is preferred. With this pole placement, the transmission line partially occupies the existing ROW, thereby reducing the size of the easement required from the private landowner. For example, if required ROW is 150 feet and the pole is placed five feet off of an existing road ROW, only an 80-foot-wide easement would be required from the landowner as the transmission line would also occupy road ROW. The arms on the pole would be approximately 85 feet above the ground depending on span length, and extend

approximately 18 feet from the center of the pole. In the maximum ROW occupancy alignment scenario, this would result in the davit arms extending into the airspace above the existing infrastructure ROW. To address potential concerns with this encroachment into the airspace above existing transportation ROW, the Applicants have also proposed an option where the poles could be placed 25 feet from the edge of the existing I-94 ROW. This would leave approximately seven feet between the end of the davit arms and the existing ROW. This gap could provide some buffer for "blowout" of the lines – a situation where the actual conductors sway out of their normal position due to high winds.

In each instance of occupying existing ROW, Applicants would have to acquire necessary approvals from the ROW owner (e.g. railroad, Mn/DOT) or the agency overseeing use of a particular ROW(e.g. Federal Highway Administration).

The three ROW occupancy scenarios (maximum occupancy, minimum occupancy, and no occupancy) are illustrated below in Diagrams 1-2 through 1-4.

Diagram 1-2. Double Circuit 345 kV/345 kV Single Pole Structure (Davit Arm) with Maximum Occupancy of ROW

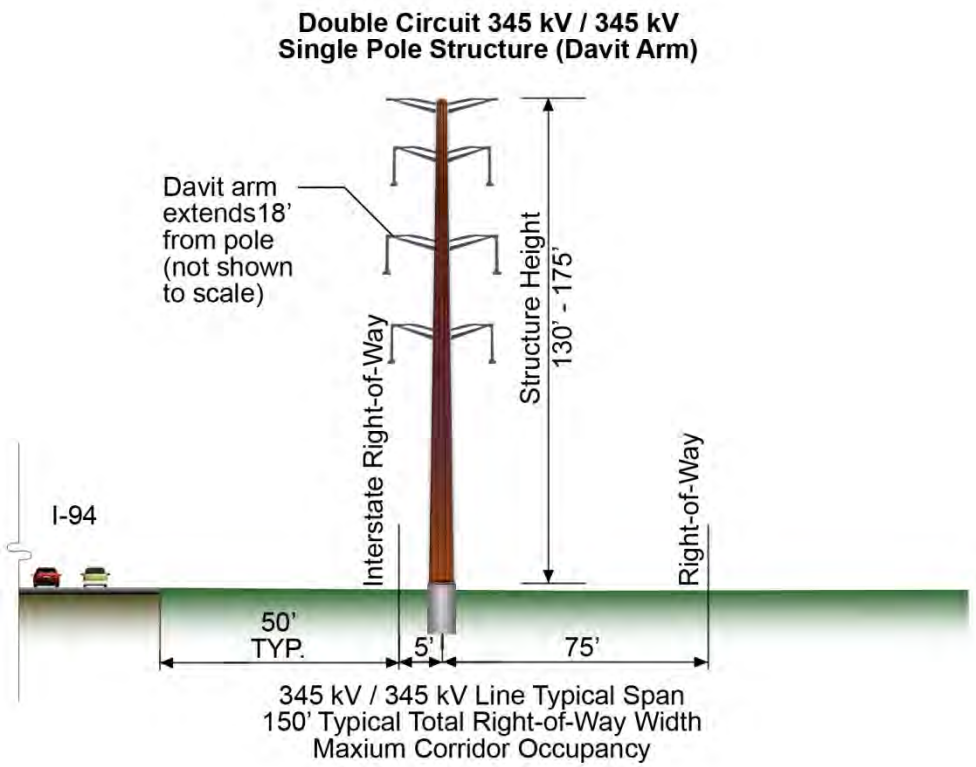


Diagram 1-3. Double Circuit 345 kV/345 kV Single Pole Structure (Davit Arm) with No Occupancy of ROW

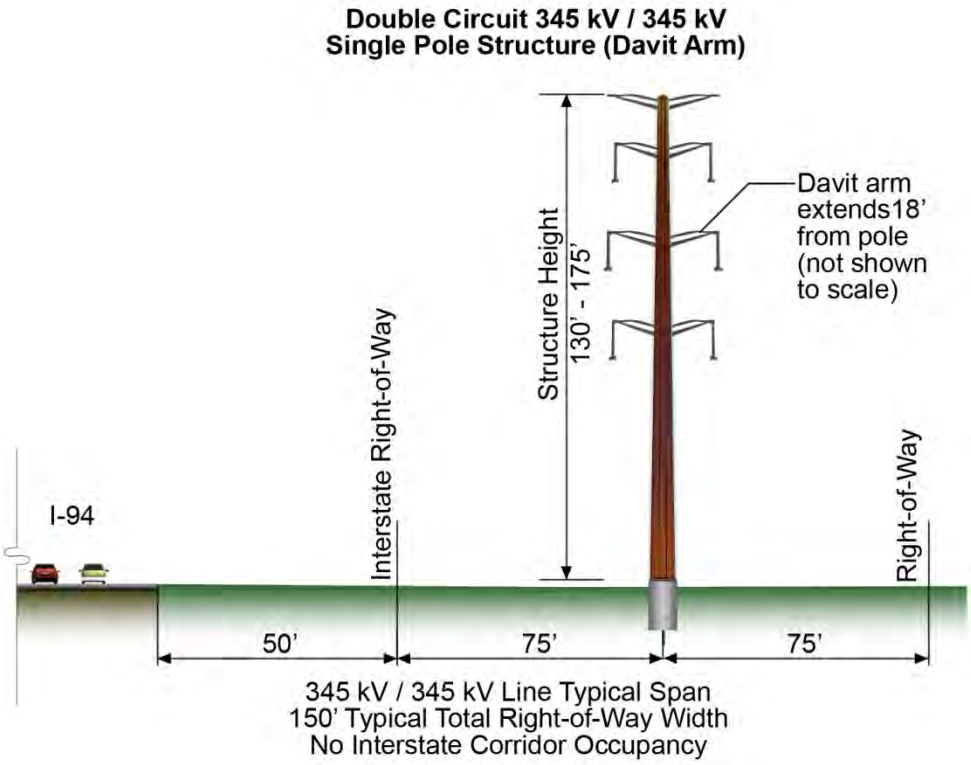
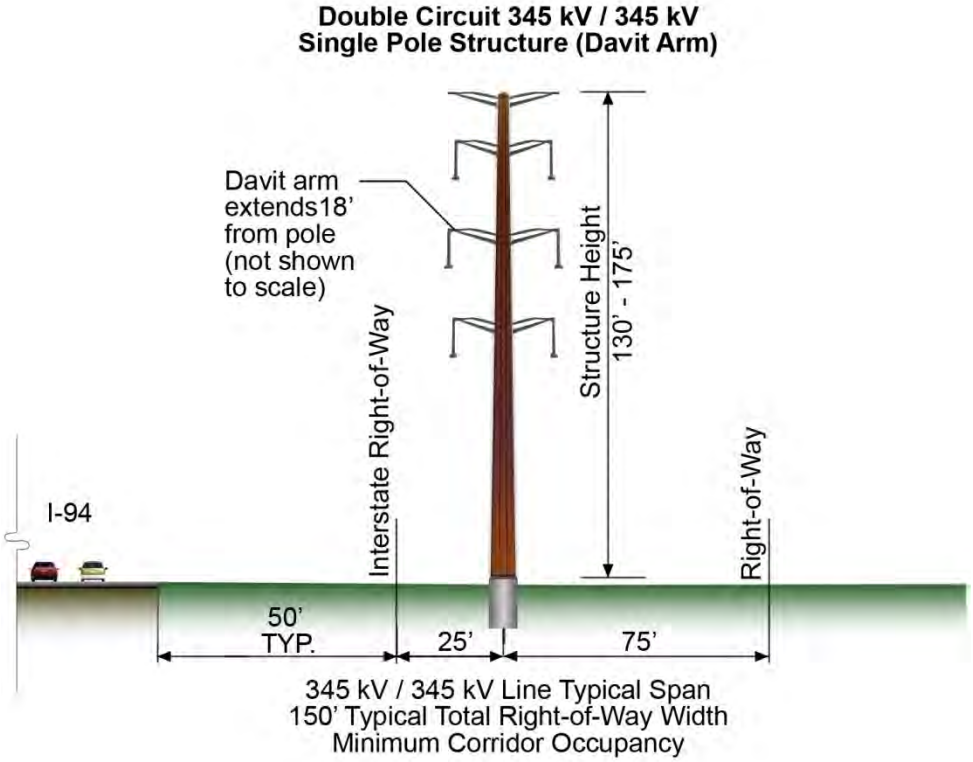


Diagram 1-4. Double Circuit 345 kV/345 kV Single Pole Structure (Davit Arm) with Limited Occupancy of ROW



As discussed previously, the Applicants have sought to identify areas to share ROW with existing infrastructure, including interstates, highways and railroads. This approach is intended to meet the statutory requirements of Minn. Stat. §216E.02, which calls for large electric power facilities to be located in a manner compatible with environmental preservation and efficient resource use.. One option to limit environmental impacts is to place new power lines near existing infrastructure as a way to minimize the proliferation of new routes. However, this may result in other transportation operation and maintenance impacts.

1.5.1 Land Acquisition Transmission Line ROW

The ROW acquisition process begins early in the detailed design process. For transmission lines, utilities typically acquire easement rights to accommodate the facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation and purchase. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

The first step in the ROW process is to identify all persons and entities who may have a legal interest in the real estate upon which the facilities would be built. To compile this list, a ROW agent or other persons engaged by Applicants would complete a public records search of all land involved in the Project. A title report is then developed for each parcel to determine the legal

description of the property and the owner(s) of record of the property and to gather information regarding easements, liens, restrictions, encumbrances and other conditions of record.

The next step is evaluation of the specific parcel. After owners are identified, and typically after a Route Permit is issued, a ROW representative contacts each property owner or the property owner's representative. The ROW agent describes the need for the transmission facilities, how the specific Project may affect each parcel, and seeks information from the landowner about any specific construction concerns. The ROW agent may also request the owner's permission for survey crews to enter the property to conduct preliminary survey work. Permission may also be requested to take soil borings to assess soil conditions and determine appropriate foundation design. Surveys are conducted to locate ROW routes, natural features, man-made features and associated elevations used during the detailed engineering of the transmission line. The soil analysis is performed by an experienced geotechnical testing laboratory.

During the evaluation process, the proposed transmission line location would be staked. This means that the survey crew identifies the proposed location of each structure or pole on the ground and marks it with a surveyor's stake. The ROW agent would show the landowner where the structure(s) would be located on the property as well as delineate the boundaries of easement area required for safe operation of the line. The ROW agent would then negotiate with the property owner(s) to determine the amount of compensation for the right to build, operate and maintain the transmission facilities within the easement area and reasonable access to the easement area. The agent would also provide maps of the transmission line route or site and the landowner's parcel and offer compensation for the transmission line easement. In the event that a complicated appraisal problem arises, an appraisal would be completed by the utility's representative(s) to determine the value of the land rights being acquired.

The landowner is allowed a reasonable amount of time to consider the offer and present any material that the owner believes is relevant to determining the property's value.

If the landowner desires a second opinion on the fair market value of the property, the landowner may have an appraisal made. The landowner is reimbursed up to $500 toward the appraiser fee as long as the appraisal follows standard and accepted appraisal practices. Minn. Stat. §117.189.

In nearly all cases, utilities are able to work with the landowners to address their concerns and an agreement is reached for the utilities' purchase of land rights. The ROW agent prepares all of the documents required to complete each transaction. Required documents may include: easement, purchase agreement or contract and deed. In rare instances, if a negotiated settlement cannot be reached, the landowner may choose to have an independent third party determine the value of the land acquisition. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minn. Stat. §117.

The process of exercising the right of eminent domain is called condemnation. In the event of a condemnation, the utility would provide the landowner with a copy of each appraisal it has obtained for the property interests to be acquired. To start the condemnation process, a utility files a petition in the district court where the property is located and serves that petition on all owners of the property. If the court approves the petition, the court then appoints a three-

person condemnation "commission." The three people appointed must be knowledgeable of applicable real estate issues. Once appointed, the commissioners schedule a viewing of the property over and across which the transmission line easement is to be located. Next, the commission schedules a valuation hearing where the utility and landowners can testify as to the fair market value of the easement or fee. The commission then makes an award as to the value of the property acquired and files it with the court. Each party has 40 days from the award filing to appeal to the district court for a jury trial. In the event of an appeal, the jury hears land value evidence and renders a verdict. At any point in this process, the case can be dismissed if the parties reach a settlement.

Once ROW is acquired and prior to construction, the ROW agent would again contact the owner of each parcel to discuss the construction schedule and requirements. To ensure safe construction of the transmission line, special consideration may be needed for fences, crops or livestock. For instance, fences may need to be moved or temporary or permanent gates may need to be installed, crops may need to be harvested early, and livestock may need to be moved. In each case, the ROW agent coordinates these processes with the landowner, who is compensated for damages.

1.5.2 Substation Land Acquisition

No additional land is required for modifications at the existing Monticello Substation. All modifications would be made inside the existing fenced area.

The Quarry Substations Siting Areas 1 and 2, in addition to Quarry Substation Site 3 would require acquisition of additional land. As the regulatory review process proceeds, Applicant representatives would consult with the owners of parcels suitable for the substations to discuss the Project in detail prior to conducting any necessary surveys and soil investigation. Applicants would also develop more site-specific designs. Contacts with the owners of affected properties would continue and the negotiation and acquisition phase would begin for Applicants to obtain the necessary land or easement rights for the proposed substation alternatives. Wherever possible, Applicants would seek to obtain necessary property rights through voluntary purchase.

During the acquisition phase, individual property owners would be advised as to the construction schedules, needed access to the site and any vegetation clearing required for the Project. The site would be cleared of the amount of vegetation necessary to construct, operate and maintain the proposed Substations. Also, any vegetation that is in the way of construction equipment may have to be removed.

Soil analysis at the substation sites would be required to assist with the final design of the substation. Applicants would inform landowners at the initial survey consultation that these borings would occur. An independent geotechnical testing company would take and analyze these borings.

1.6 ESTIMATED PROJECT COST

Depending on the route selected, the Project would cost between $76.2 million and $94.9 million ($2008). Total costs are summarized in Table 1-11 and Table 1-12.

Table 1-11. Transmission Line Costs

Alternative	Cost
Transmission Line Routes	
Applicant Preferred Route	$54,200,000
Route A	$65,400,000
Route B	$71,500,000
Route C	$65,500,000
Route D	$60,200,000
Substations	
Monticello Substation Modifications	$7,800,000
Applicants' Substation	$14,200,000
Substation with 115kV Interconnect	$15,600,000

Table 1-12. Total Project Costs

Route		Total Estimated Cost
Applicant Preferred Route and Monticello Substation	with Applicants' Substation	$76,200,000
	Substation with 115 kV Interconnect	$76,200,000
Route A and Monticello Substation	with Applicants' Substation	$87,400,000
	Substation with 115 kV Interconnect	$88,800,000
Route B and Monticello Substation	with Applicants' Substation	$93,500,000
	Substation with 115 kV Interconnect	$94,900,000
Route C and Monticello Substation	with Applicants' Substation	$87,500,000
	Substation with 115 kV Interconnect	$88,900,000
Route D and Monticello Substation	with Applicants' Substation	$82,200,000
	Substation with 115 kV Interconnect	$83,600,000

The costs identified above are based on the maximum occupancy of ROW alignment as associated with the Applicant Preferred Route and Route A, and the single proposed alignment associated with Route B, Route C, and Route D. These costs are rough estimates and do not account for potential line ROW adjustments that may occur as the project moves through the process.

1.6.1 Operation and Maintenance

The primary operating and maintenance cost for transmission lines is the cost of inspections, usually done monthly by air and by ground once a year. Annual operating and maintenance costs

for transmission lines in Minnesota and the surrounding states vary depending upon the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used and the transmission line's age. For 115 kV through 345 kV transmission lines, past experience has shown that generally beyond the first 10 years of operation, operation and maintenance costs are approximately $300 to $500 per mile.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the National Electric Safety Code (NESC). Transformers, circuit breakers, batteries, protective relays and other equipment need to be serviced periodically in accordance with the manufacturer's recommendation. The site itself must be kept free of vegetation and drainage must be maintained.

2.0 REGULATORY FRAMEWORK

The purpose of this section is to describe the process a permit applicant is required to follow when seeking coverage under the full permitting process for a high voltage transmission line in the State of Minnesota.

2.1 CERTIFICATE OF NEED

The Commission granted a Certificate of Need for the project in early 2009. A Certificate of Need is required for any "large energy facility" being proposed in the State of Minnesota. A large energy facility includes "any high-voltage transmission line with a capacity of 200 kilovolts or more and greater than 1,500 feet in length" (Minn. Stat. §216B.2421, subd. 2(2)).

Applicants filed an application with the Commission on August 16, 2007, for a Certificate of Need to construct three 345 kV transmission line projects in Minnesota. Applicants proposed to construct the Twin Cities to La Crosse (now referred to as Hampton to La Crosse), Twin Cities to Fargo (now referred to as the Monticello to St. Cloud 345 kV Project, subject to this Application, and the Fargo to St. Cloud 345 kV Project), and Brookings to Twin Cities (now referred to as Brookings County to Hampton) 345 kV projects in the following Certificate of Need application: In the Matter of the Application of Great River Energy, Northern States Power Company (d/b/a Xcel Energy) and others for Certificates of Need for the Three CapX2020 345 kV Transmission Lines, Docket No. ET-2, E-002, et al./CN-06-1115.

The Commission referred the matter to the Office of Administrative Hearings for hearing before ALJ Beverly Heydinger. Prior to the evidentiary hearing, 19 public hearings were held in the areas where the three 345 kV projects are proposed, commencing on June 17, 2008, in Moorhead, Minnesota and ending July 2, 2008, in Rochester, Minnesota. An evidentiary hearing was held from July 14, 2008, to August 1, 2008; from August 11, 2008, to August 14, 2008; and from September 11, 2008, to September 18, 2008, in St. Paul, Minnesota.

On February 27, 2009, the ALJ submitted a report to the Commission containing her Findings of Fact, Conclusions of Law and Recommendation. In that report, the ALJ determined that certificates of need for the Fargo to Monticello 345 kV Project should be granted using double-circuit capable structures with only the first circuit being implemented at this time.

2.2 ROUTE PERMIT

A route permit must be granted to any permit applicant proposing to construct a large electric power generating planet or a high voltage transmission line in Minnesota. As defined in Minnesota Statute §116C.57 Subd. 2a states, "Any person seeking to construct a large electric power generating plant or a high voltage transmission line must apply to the board for a site permit or a route permit." Minnesota Statute §116C.52, Subd. 4 defines a high voltage transmission line (HVTL) as "a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length."

Under the siting authority defined by Minnesota Statute §116C.53, it is the policy of the PUC to choose routes "that minimize adverse human and environmental impact while insuring

continuing electric power system reliability and integrity, and insuring that electric energy needs are met and fulfilled in an orderly and timely fashion." The route permit would contain conditions specifying route location and width, corridor constraints, construction requirements and system operational standards.

2.3 ENVIRONMENTAL REVIEW PROCESS

Route permit applications for high voltage transmission lines are subject to environmental review in accordance with Minnesota Rules7850.1700 to 7850.2700 (full permitting process). Scoping is the first step in the permitting process after application acceptance. The scoping process has two primary purposes, to ensure that the public has a chance to participate in determining what routes and issues to study in the EIS, and to help focus the EIS on the most important issues surrounding the route permit decision.

OES staff collected and reviewed comments on the scope of the EIS by holding two Scoping Meetings at 1:00 pm and 6:00 pm on July 2, 2009. Approximately 100 people attended the two public meetings, which provided the public an opportunity to learn about the proposed Project and the route permitting process, review the route permit application, and ask questions and submit comments. A court reporter was present at each of the public meetings and transcribed questions asked and comments made by the public as well as responses from the OES and the applicants. The OES also accepted written comments from July 2, 2009, through July 24, 2009.

In addition, OES convened a 15 member ATF. The ATF was charged with: (1) identifying local site or route specific impacts and issues of local concern, and (2) identifying alternative transmission line routes or substation locations that may maximize positive impacts and minimize or avoid negative impacts of the Project. The task force met three times between June and August 2009. The task Force issued a Final Report in September 2009. The report identified four route alternatives and two alternative sites for the substation to be considered in the EIS. The ATF reports are available at http://energyfacilities.puc.state.mn.us/Docket.html?Id=19957.

All of the written and oral comments submitted at the scoping meetings along with comments received by mail and email were reviewed and entered into a database. Each comment was evaluated for issues or concerns that should be considered for detailed evaluation in the EIS and were classified based on the major topics of the comments. The Scoping Decision Document was developed using the relevant comments received during the public process.

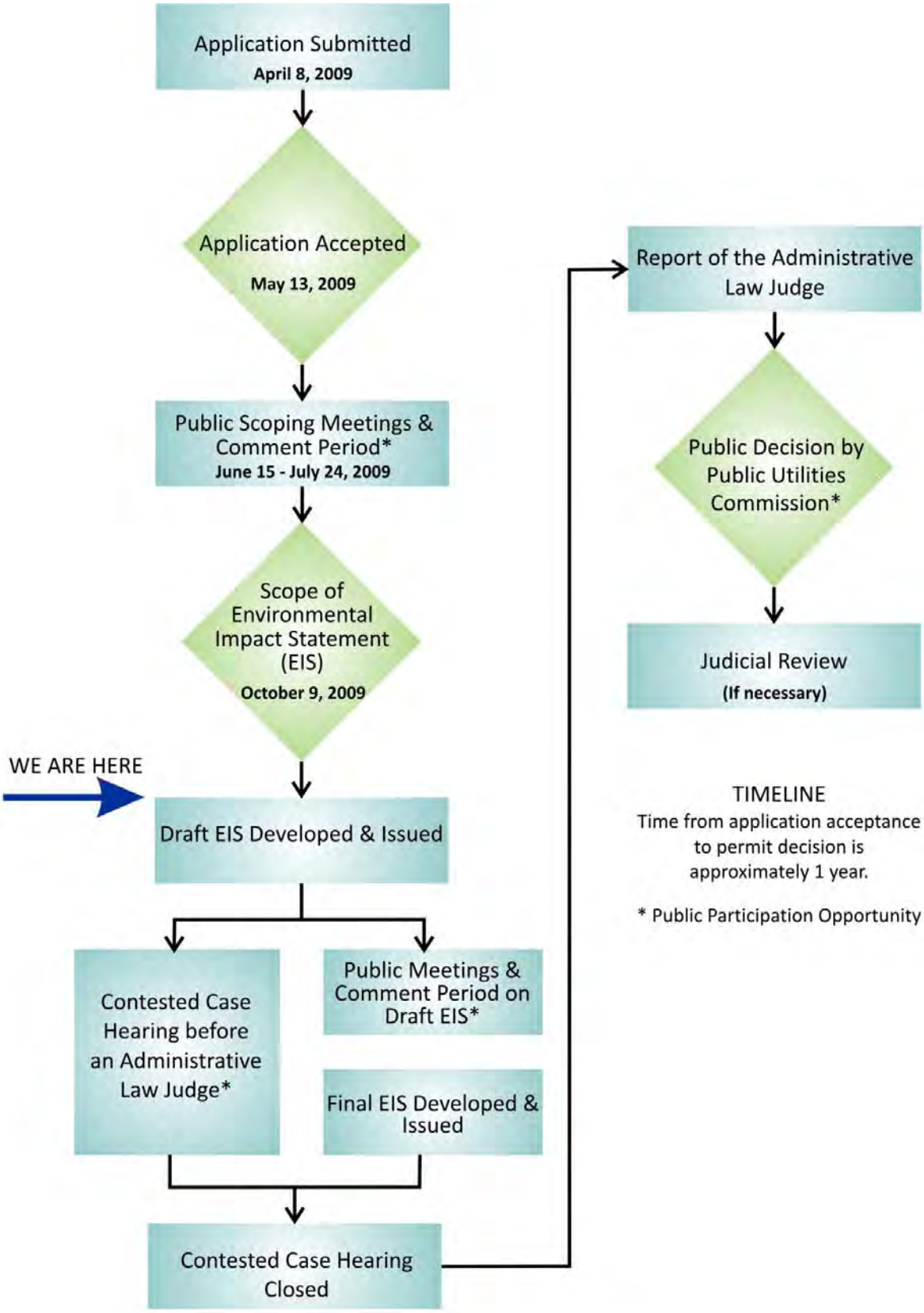
The Scoping Decision Document for this DEIS was issued by the Director of the Office of Energy Security on October 9, 2009 and is attached as Appendix A. The public would be given additional opportunities to participate in the environmental analysis process for the Proposed Project. A comment period, as required under Minnesota Rules 7849.5300, subpart 7, would be open from January 11, 2010 (the publication date of this DEIS), until February 19, 2010. A copy of this DEIS has been placed in the following libraries: St Cloud, Monticello, Elk River, Buffalo, Stickney Crossing and Al Ringsmuth. A notice of the availability of this DEIS has been sent to each person on the Project contact list. A notice of the availability of this DEIS has also been placed in the *EQB Monitor*.

A public information meeting on the DEIS will be held during the public comment period to comply with Minnesota Rules. The public will be given an opportunity to comment on the DEIS at the public meeting and throughout the comment period.

After the FEIS is published and the ALJ issues the findings of fact, conclusion of law, and order with recommendations, the commission will make a route permit decision. The date for the commission's decision will not be scheduled until the FEIS and ALJ report are issued. The commission must first find that the DEIS has adequately addressed potential environmental issues presented in the scoping decision. Then the commission would make a decision on which route to permit and what conditions to include in the route permit.

The diagram below illustrates the permitting process and also identifies where this Project is in the process.

Diagram 2-1. Permitting Process



3.0 ENGINEERING AND OPERATION DESIGN

An HVTL consists of three phases, each at the end of a separate insulator string, all physically supported by structures. Each phase consists of one or more conductors. When more than one conductor is used to make up a phase, the term "bundled" conductors is used. Conductors are metal cables consisting of multiple strands of steel and aluminum wire wound together. There are also two shield wires strung above the electrical phases to prevent damage from lightning strikes. These cables are typically less than one inch in diameter. The shield wire can also include fiber optic cable which provides a communication path between substations for transmission line protection equipment. There are several different types of structures used for transmission lines, including single steel pole structures and H-frame structures. Transmission lines are constructed in a ROW, the width of which is primarily dependent on structure design, span length and the electrical safety requirements associated with the transmission line's voltage.

3.1 TRANSMISSION LINE CONDUCTORS

Each phase would normally consist of bundled conductors composed of two 954 Aluminum Conductor Steel Supported (ACSS) cables or conductors of comparable capacity. Each conductor is 954,000 circular mils or approximately 1.2 inches in diameter. ACSS consists of steel wires at the center surrounded by aluminum strands. Applicants propose to use the same conductor and bundled configuration for most of the Project. Table 3-1 summarizes the structure designs and foundations for the proposed single pole structures that would be installed for the Project.

3.2 TRANSMISSION LINE STRUCTURES

Applicants propose to use primarily single pole, self-weathering or galvanized steel double circuit capable structures (Table 3-1). Only one circuit would be installed for this Project. Self-weathering steel oxidizes or rusts to form a dark reddish brown surface coating to protect the structure from further weathering. Single steel pole structures are typically placed on a concrete foundation. There may be site-specific conditions where specialty or multiple pole structures could be required.

Table 3-1. Structure Design Summary

Line Type	Structure Type	Structure Material	ROW Width (feet)	Structure Height (feet)	Structure Base Diameter (inches)	Foundation Diameter (feet)	Span Between Structures (feet)
345 kV/345kV Double Circuit	Single Pole Davit Arm	Steel	150 total	130-175	36-48 (tangible structures) 48-72 (angle structures)	6-12	600-1,000
115kV Single Circuit	Single Pole, Post Insulators	Steel	75 total (assumed)	70-90	20-40	Direct Embed and 6 ft Drilled Piers	400-600

The proposed transmission line and substation would be designed to meet or surpass all relevant local and state codes, NESC and North American Electric Reliability Corporation (NERC) requirements and Applicants' standards. Appropriate standards would be adhered to for construction and installation and all applicable safety procedures would be followed during and after installation.

3.3 SUBSTATIONS

3.3.1 Monticello Substation (Existing)

The Monticello Substation is an existing substation adjacent to the Monticello Nuclear Power Plant in Monticello, Minnesota. No additional land or access is required for the necessary modifications at the Monticello Substation. Equipment to be installed includes 345 kV equipment (including switches, control panels, and circuit breakers), foundations and structures.

3.3.2 Proposed Quarry Substation Sites 1, 2 and 3

The Quarry Substation would be a new substation proposed in the area around Minnesota State Highway 23 just north of I-94. There are three substation sites being evaluated in the EIS. Site 1 is west of Highway 23 and site 2 is east of 23. Substation site 3 and is located south of County Road 6 and north of Interstate 94.

The proposed Quarry Substations 1 and 2 would be connected to the existing 115 kV transmission line running between the St. Cloud and Sauk River Substation. This transmission line runs in a north south direction through both the proposed 1 and 2 substation sites. Equipment being installed during the initial phase includes a 345 kV ring bus with three circuit beakers, two 345 kV line positions, 448 MVA, 345/115 kV transformer, 115 kV ring bus with three circuit breakers and two 115 kV line positions. The substation equipment being installed also includes the associated switches, bus work, foundations, steel structures and control equipment.

Proposed Quarry Substation 3 would not be located near the existing power infrastructure. This would also require an additional three and one half miles of feeder line to be interconnected with the existing St. Cloud to Sauk River 115 kV transmission line (Figure 1-2).

The substations would be configured to accommodate any future addition of the second circuit of the Monticello to St. Cloud 345 kV line and other future high voltage transmission lines. The fully developed substation would require a total graded and fenced area of up to 15 acres.

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4.0 CONSTRUCTION

Construction cannot begin until federal, state and local approvals are obtained; property and ROWs are acquired; soil conditions are established; and final design is completed. The precise timing of construction would take into account various requirements that may be in place due to permit conditions, system loading issues and available workforce.

The actual construction would follow standard construction and mitigation practices that were developed from experience with past projects following an agricultural mitigation plan. These best practices address ROW clearance, staging, erecting transmission line structures and stringing transmission lines. Construction and mitigation practices to minimize impacts would be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain and other practices. In some cases these activities, such as schedules, are modified to minimize impacts to sensitive environments.

4.1 TRANSMISSION LINE AND STRUCTURES

Transmission line structures are generally designed for installation at existing grades. Typically, structure sites with 10 percent or less slope would not be graded or leveled. Sites with more than 10 percent slope would have working areas graded level or fill brought in for working pads. If the landowner allows, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities. If permission is not obtained, the site is graded back to its original condition to the extent practical and all imported fill is removed from the site.

Construction equipment that would be used on the Project consists of tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete trucks and various trailers. Many types of excavation equipment are set on wheel or track-driven vehicles. Poles would be transported on tractor-trailers.

Staging areas would be established for the Project. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. The materials would be stored at the staging areas until they are needed for the Project. Temporary lay down areas may be required for additional space for storage during construction. These areas would be selected for their location, access, security and ability to efficiently and safely warehouse supplies. The areas are chosen to minimize excavation and grading. The temporary lay down areas and any staging areas outside of the transmission line ROW would be obtained from affected landowners through rental agreements.

Access to the transmission line ROW route would likely be made directly from existing roads or trails that run parallel or perpendicular to the transmission line ROW. In some situations, private field roads or trails may be used. Permission from the property owner would be obtained prior to accessing the transmission line route. Where necessary to accommodate the heavy equipment used in construction; including cranes, cement trucks and hole-drilling equipment; existing access roads could be upgraded or new roads could be constructed. New access roads could also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches.

When it is time to install the poles, they would be moved from the staging areas, and delivered to the staked location. The structures would be placed within the ROW until set. Insulators and other hardware would be attached while the pole is on the ground. The pole is then lifted, placed and secured using a crane. The conductors are then clipped to the insulators, as shown in Diagram 5-1.

In general, structures would have drilled pier concrete foundations (see Diagram 5-2). Drilled pier foundations may vary from six to nine feet in diameter and 25 or more feet deep, depending on soil conditions. After the concrete foundation is set, the pole is bolted to the foundation. Concrete trucks are required to bring the concrete in from a local concrete batch plant.

Construction mats could also be placed in wet or soft soil locations and narrow ditches to minimize disturbances. These mats could also provide access to sensitive areas during times when the ground is not frozen to minimize impacts at the site. Diagram 5-4 shows an example of construction mats.

If landowner permission is obtained, it is preferred to spread excess soil from foundation holes on the structure site. If that is not permitted, it could be offered to the landowner or would be completely removed from the site.

The conductors are then installed by establishing stringing setup areas within the ROW or on temporary construction easements outside the ROW. These stringing setup areas would be located every two miles along a Project route. Conductor stringing operations also require brief access to each structure to secure the conductor wire to the insulator hardware and the shield wire to clamps once final sag is established. When the transmission line crosses streets, roads, highways, or other energized conductors or obstructions, a temporary guard or clearance poles would be installed. This ensures that conductors would not obstruct traffic or contact existing energized conductors or other cables during stringing operations; it also protects the conductors from damage.

Environmentally sensitive areas and wetland areas may also require special construction techniques in some circumstances. During construction, the most effective way to minimize impacts to wet areas would be to span all streams and rivers. In addition, Applicants could avoid driving construction equipment waterways except under special circumstances and only after discussion with the appropriate resource agency. Where waterways must be crossed to pull in the new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices help prevent soil erosion and ensure that equipment fueling and lubricating would occur at a reasonable distance from waterways. Additional mitigative measures relating to wetlands are contained in Section 5.17.

4.2 SUBSTATIONS

4.2.1 Monticello Substation (Existing)

No additional land is required for modifications at the existing Monticello Substation. All modifications would be made inside the existing fenced area.

4.2.2 Proposed Quarry Substation sites

Construction is planned to begin once required approvals are obtained and property acquisition is complete. A detailed construction schedule would be developed based upon the availability of crews, weather conditions, spring load restrictions on roads and any specific area restrictions in place to minimize construction impacts.

Once the site is graded, a perimeter fence would be erected to secure the site. The fenced area would include approximately 15 acres. Concrete foundations would be poured to support the substation equipment and the control house. After grading, fencing and foundation work have been completed, the substation and control house erection would commence. Applicants would also construct permanent access roads to provide for ingress and egress for its substation operating personnel and equipment maintenance. Construction of the Quarry Substation Site 3 would also require the construction of approximately 3.5 miles of new 115kV transmission line to connect to the existing St. Cloud to Sauk River 115kV transmission line (see Section 3.3.3).

Erosion control methods would be implemented to minimize runoff during construction. Applicants would comply with all local, state, NESC, and internal standards regarding clearance to ground, clearance to other utilities in the area, clearance to buildings, and other applicable standards.

4.3 CLEANUP AND RESTORATION

During construction of the transmission line and in areas outside of the fenced area of the existing and proposed substations, crews would attempt to limit ground disturbance wherever possible. However, areas are disturbed during the normal course of work, which can take several weeks in any one location. As construction on each parcel is completed, disturbed areas would be restored to their original condition to the maximum extent practicable. The ROW agent would contact each property owner after construction is completed to see if any damage has occurred as a result of the Project. If damage has occurred to crops, fences or the property, Applicants would reimburse the landowner for the damages sustained.

In some cases, Applicants may engage an outside contractor to restore the damaged property to as near as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of transmission line may naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the proposed transmission line route could require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

- Erosion control blankets with embedded seeds;
- Silt fences; and
- Straw bales.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction permit plans. Long-term impacts are minimized by utilizing these construction techniques.

4.4 MAINTENANCE

4.4.1 Transmission Lines

Transmission lines are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation. The estimated service life of a transmission line for accounting purposes is approximately 40 years. However, from a practical perspective, HVTLs are seldom completely retired. Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of severe weather conditions such as tornadoes and ice, transmission lines rarely fail. Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, usually done monthly by air. Annual operating and maintenance cost for transmission lines in Minnesota and the surrounding states vary. For voltages from 115 kV through 345 kV, the Applicant's experience shows that costs are approximately $300 to $500 per mile. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used and the age of the line.

4.4.2 Substations

Similar to transmission lines, substations are also designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation. The principal operating and maintenance cost for substation facilities is the cost of routine inspections.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and NESC and NERC requirements. Transformers, circuit breakers, batteries, protective relays and other equipment need to be serviced periodically in accordance with the manufacturer's recommendation. The site itself must be kept free of vegetation and drainage must be maintained. The substation equipment that would be installed as part of the Project includes state of the art circuit breakers designed to minimize the risk of sulfur hexafluoride (SF6) release. SF6, used as an insulator in breakers, is considered a greenhouse gas by the Environmental Protection Agency (EPA). Current technologies require less SF6 at lower pressures than older technologies, resulting in a more secure system. Absent an equipment failure, newer breakers contain and maintain SF6 levels and do not sustain the releases associated with older circuit breakers.

4.5 UNDERGROUND OPTIONS

Underground lines are a viable transmission construction option where there are significant aboveground constraints that would make overhead transmission line construction difficult or impossible. Underground lines require additional equipment to compensate for voltage rise along the distance of the transmission line. The additional equipment translates to a higher overall cost, limits the length of the underground installation, and increases the likelihood of failure due to additional components. Depending on the type of cable system used, cooling equipment may be required at underground transmission line substations. Overhead lines are air cooled and widely spaced for safety.

In general, there are three major types of underground transmission facilities: high- and low-pressure oil-filled systems, solid dielectric systems, and compressed gas insulated systems. These systems may require the installation of additional cables to meet the equivalent capacity requirements of the overhead line.

Where undergrounding of high voltage transmission lines is necessary, there are a number of factors that should be considered. Installation generally includes direct burial in backfilled trenches and concrete trenches with covers or concrete duct banks. Constructing the trench for the underground transmission line could result in greater temporary construction impacts than the proposed overhead line. Underground transmission construction as compared to overhead lines increases noise, dust, and traffic disruption. Considerable clearing and grading could be expected in suburban and rural settings, and dust and noise from construction could last three to six times the duration of an overhead line. Concrete manholes or large splice vaults are needed at recurring intervals. Similarly, maintenance and repair activities for underground lines may result in greater disturbance than overhead lines.

A typical progression rate for underground construction would be two to three days for each 200-foot section of trench. Approximately 500-to 700-feet of trench is open at one time. Steel plates are typically placed over open sections of trench when crews are not at that location. Access to homes (driveways, front yards, sidewalks, and street parking) may be limited for during construction and traffic detours may be required. According to the Applicants, underground conductors of the size appropriate for this Project are generally limited to approximately 1,000-foot-long segments, due to the state of the technology, materials, and shipping weight and size restrictions.

An underground line would be routed to avoid other underground installations such as water, gas, and sewer lines. Unstable slopes, hazardous material sites, wetlands, and bedrock would be avoided. Going under a road, highway, or river requires construction techniques such as directional boring. All these aspects of underground transmission construction lead to a higher cost than overhead line construction.

Maintenance and repair of underground transmission lines is generally more complex than for overhead lines. It can be difficult to determine the location of a failure on an underground line. Overhead failures can usually be found through visual inspection. Underground cable failures must first be located, then excavated and repaired. These excavated repairs generally take longer than overhead line repairs, depending on the extent of damage and the availability of

replacement materials, so there could be significant impacts to traffic and residences adjacent to the excavation.

5.0 AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

This EIS analyzes the human and environmental impacts within each route and substation alternative. This approach provides information to make a informed decision on the ability to construct and operate a transmission line and substation that avoids or minimizes social, economic, and environmental impacts.

Four route alternatives are being analyzed in this EIS; all are located in Sherburne, Wright, and Stearns counties in Minnesota. All of the route alternatives commence at the Monticello substation and terminate at a new Quarry substation west of St Cloud. The Applicant Preferred Route, Route A, Route B, and Route C travel in a northwest direction through Monticello, Silver Creek, Clearwater, Lynden and St. Joseph townships on the south side of the Mississippi River. Route D travels in a in a northwest direction through Monticello, Becker, Clear Lake, Haven, and St. Joseph townships on the north side of the Mississippi River.

Three substation alternatives are analyzed in this EIS. Two of the substation alternatives, the Quarry Substation Site 1 and the Quarry Substation Site 2 , are located in St. Joseph Township. The northern half of the third substation alternative, Quarry Substation Site 3, is located St. Joseph Township and the southern half of the site is located in Rockville Township.

5.1 ENVIRONMENTAL SETTING

Stearns, Wright, and Sherburne counties lie in the northern rim of the Central Plains region; this region is characterized by a high density of lakes, and extensive wetlands, rivers, and streams. This portion of Minnesota was covered by glacial ice over 15,000 years ago. The landscape resulting from glaciation is characterized by young plains, moraines, lakes, and lacustrine beds. The topography in the Project area is relatively level to sloping land with elevations ranging from 950 to 1030 feet. The routes being analyzed parallel the Mississippi River on both the north and south sides. The Project mostly lies in the Anoka Sand Outwash plain. The Anoka Sand Outwash Plain was formed from outwash from glacial melt waters. Pre-settlement vegetation was primarily brush, oak trees, and jack pine trees. The primary present day land use is sod, supporting vegetable agriculture crops, and some open or barren areas. Peat and muck areas have been drained to grow crops on these rich soils. Agricultural land use is prevalent in the region, and includes pasture and cropland for corn, mineral sod, soybeans, oats, and spring wheat.

Geology and Groundwater

The regional surficial geology primarily includes ground moraines and outwash plains deposited by glaciers. The moraines are primarily sand, silt and clay mixtures with rock. Glacial outwash and alluvium are present along the Mississippi River. Alluvium is also associated with other area streams and rivers. The glacial outwash is primarily shallow sand and gravel deposits in glacial melt water channels. The alluvium is composed of shallow surficial sand and gravel deposits and is located along main drainages.

The regional depth to bedrock generally ranges from zero to 50 feet. The uppermost bedrock are from the Mesozoic and Paleozoic Eras. The Mesozoic bedrock is primarily siltstone, sandstone, and shale. The Paleozoic bedrock is primarily porphyritic granodiorite. Mineral resources in the regional area consist of shallow sand and gravel deposits in moraines, outwash, and alluviums. The locations of former sand and gravel pits shown on topographic maps and in the Stearns and Wright county soil surveys indicate that most exploitable aggregate resources in the area occur along rivers and streams.

Ground water occurrence in Minnesota is relative to the local geologic conditions that determine the type and properties of aquifers. Ground water resources are mapped regionally into provinces and there are a total of six ground water provinces in the state based on bedrock and glacial geology. According to the Minnesota Department of Natural Resources (MnDNR), the provinces occur in two general geologic settings: bedrock comprising a wide range of rock types and ages, and unconsolidated sediments deposited by glaciers, streams, and lakes. Wright and Sherburne counties fall within the Metro Province and the Central Province.

These provinces are characterized by buried sand aquifers and relatively extensive surficial sand plains as part of a thick layer of unconsolidated sediments deposited by glaciers overlying the bedrock. The Metro Province is defined by sandy aquifers in areas greater than 100 feet of sandy and clayey drift overlying Precambrian sandstone and Paleozic sandstone, limestone and dolostone aquifers. The Central Province is defined by clayey glacial drift overlying Cretaceous and Precambian bedrock. Stearns County is located entirely within the Central Province. The

Metro Province is underlain by sedimentary bedrock that has good aquifer properties, but in the Central Province the glacial sediments are thick, sand and gravel aquifers are common, and the deeper fractured bedrock is rarely used as an aquifer (MnDNR 2001).

Land Cover

The State of Minnesota follows the National Hierarchical Framework of Ecological Units for developing an Ecological Classification System (ECS) for ecological mapping and landscape classification. The state is divided into four ecological provinces, 10 sections and 26 subsections. Provinces are defined units of land using major climate zones, native vegetation, and biomes such as prairies, deciduous forests, or boreal forests. The Proposed Routes are mostly within the province classified as the Eastern Broadleaf Forest. Sections are units within provinces defined by origin of glacial deposits, regional elevation, distribution of plants, and regional climate. The Proposed Routes traverse the Minnesota and northeastern Iowa Morainal Section. Subsections are units within sections defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees. The Proposed Routes traverse three subsections; the Big Woods, Minnesota River Prairie, and Hardwood Hills subsections.

Historically prairie covered much of the State of Minnesota. This original prairieland was the eastern edge of the Great Plains and was part of the northern tallgrass prairie. Deciduous forests occurred along the north and eastern edges of the prairie. A few small tracts of remnant prairie still occur in western and southern Minnesota. Since European settlement of the region in the 1800s, forested areas, native grass prairies, and wetlands have been largely disturbed, altered, or destroyed. The original vegetation includes areas of hardwood forest, brush land, and prairie. Much of the area has been converted to cropland, resulting in the loss of much of the original vegetation. Wetland loss has also occurred over most of the Project study area due to drainage and filling activities for agricultural and other uses. The majority of the area has less than 50 percent of its pre-settlement wetlands remaining.

Specific vegetative land cover classifications within the Project area include:

- Cropland,
- Grassland,
- Wooded and Forested Land,
- Aquatic Environments (Open Water, Wetlands)
- Urban and vacant land, and
- Shrubland

Table 5-1. Land Cover

Routes and Substations	Agricultural Lands (Grasslands and Croplands)	Wooded and Forested Land	Aquatic Environments	Urban and Vacant Land	Shrubland
Applicant Preferred Route	3318.4	286.2	173.9	653	140.6
Route A	3823.9	367	176.4	349.4	83.4
Route B	3774.5	442.4	169.9	105.1	113.1
Route C	3768.1	463.1	184.2	98.5	91.8
Route D	3158	374	141.7	263.6	95.4
Quarry Substation Site 1	81.7	6.4	0.4	0.9	0.2
Quarry Substation Site 2	284.5	2.7	3.5	5.2	0.8
Quarry Substation Site 3 and the 115kV Interconnect	321.1	43.8	41.7	6.7	20.4

GAP Data for 1000 ft wide routes and substation siting areas

Cropland may be defined as land used for the production of cultivated crops or used for pasturing livestock. Sub-classifications for this cover type include wheat, corn, sugar beets, hay, soybeans, small grains, and pasture. Cropland may also include lands enrolled in the U.S. Department of Agriculture's (USDA) Conservation Reserve Program. Some small remnants of natural/native prairie occur in Project area. Grasslands are areas dominated by upland grasses and forbs. These areas are not subject to active management and are generally used for grazing.

There are several wooded and forested land cover areas within the regional area, including dry, mesic, and wet forests. These forest community types vary depending on the hydric characteristics of the soil. Dry forests are dominated by white, black, and pin oaks; bitternut hickory; and red maple. Mesic stands comprise red, white, or bur oaks; sugar maple; basswood; green ash; bitternut hickory; big tooth aspen; and butternut. Wet forest areas are typically associated with larger river systems and occur on floodplains. Dominant species consist of green ash, slippery red rock elms, silver maples, cottonwood, black willow, American elm, and bur oak. Black ash, American hornbeam, ironwood, boxelder, hackberry, and basswood are subdominant species. The remaining native vegetation types occurring within the Big Woods and Hardwood Hills, contain fragmented and limited contiguous segments of wooded and forest tracks. Undisturbed wooded or forested areas are rare.

Undisturbed wetland areas within the Project study area contain mostly native vegetation. Disturbed wetlands may contain non-native vegetation such as reed canary grass, hybrid cattail, and others. See Section 5.19 for a detailed discussion on flora. Wetland areas are described as those areas meeting three indicative criteria: soils, hydrology, and vegetation. Wetland areas are

discussed in more detail below. Non-wetland areas are those that neither meet wetland criteria, nor are they open water areas (lakes, streams, and rivers). Vegetation within non-wetland and upland areas consists of plants adapted to soils under aerobic conditions, whereas wetland vegetation is typically adapted to anaerobic soil conditions. See Section 5.17 for a detailed discussion on wetlands.

Urban and vacant land consists of areas of concentrated populations and intensive use. Much of the land is covered by structures (residences, commercial, industrial, and governmental) and hosts various forms of infrastructure.

Shrublands are areas characterized by lower growing natural or semi-natural woody vegetation. Deciduous and evergreen varieties of shrubs, small trees, or immature vegetation is included in the coverage.

Human Settlement

Dense residential land use within the Project area is primarily limited to the St. Cloud, Becker and Monticello incorporated areas, with dispersed rural residential uses occurring throughout the balance of the Project area. Existing land use in the area is predominantly agricultural or undeveloped land; however, low density, single-family, or rural residential uses also occur. Interspersed commercial and industrial uses occur along I-94 and other existing roadways. Local zoning districts traversed by the Proposed Routes include mostly agricultural-related classifications although residential, commercial, and industrial zoning districts are also affected.

5.2 SOCIOECONOMIC

The Project is anticipated to to have minimal effect on local economies in Sherburne, Stearns, and Wright counties. The factors considered in the analysis were population, income, poverty, and employment.

5.2.1 Affected Environment

The Project is in the upper Mississippi Valley of east central Minnesota. The area of study for the socioeconomic analysis includes Stearns, Sherburne, and Wright counties in central Minnesota. The Proposed routes are located entirely in Sherburne, Stearns and Wright counties; these counties would likely experience effects on local employment and economies from the construction and operation of the proposed Project. Socioeconomic factors analyzed include population, income, poverty, and employment. U.S. Census data for 2006-2008 American Community Survey estimates were obtained at the community and township level to characterize the area. These datasets were compared to county and state data, as demonstrated below in Table 5-2.

Table 5-2. Population Characteristics

Location	Population	White or Caucasian	Black or African American	Asian	Other Races	Hispanic or Latino
Sherburne County	85,974	82,108 95.5 %	1,098 1.3 %	942 1.1 %	1,826 2.2%	1,617 1.9 %
Stearns County	145,810	138,060 94.7 %	2,145 1.5 %	2,358 1.6 %	3,247 2.2%	2,692 1.8 %
Wright County	116, 777	111,514 95.5 %	1,270 1.1 %	1,040 0.9 %	2,953 2.6 %	2,312 2.0%
State of Minnesota	5,181,962	4,559,336 88.0 %	225,648 4.4 %	180,835 3.5 %	216, 143 4.2 %	208.052 4.0 %

Source: U.S. Census 2006-2008 ACS estimates.

The three-county area is located between St. Cloud and the Twin Cities (Minneapolis and St. Paul). The population of Stearns County is concentrated in the St. Cloud area, which is 65 miles northwest of downtown Minneapolis. St. Cloud is the largest city near the proposed routes. Development in St. Cloud is expanding southeast while the Twin Cities metro area is expanding northwest. Considerable growth is expected in the three-county area between these two metropolitan areas, in part because the area is located within commuting distance of St. Cloud and the Twin Cities along I-94. The Minnesota Demographic Center projects continuation of this growth trend over the next 30 years and indicates that the Sherburne County population would grow by 89 percent, Stearns County by 33 percent, and Wright County by 54 percent between 2000 and 2030 (St. Cloud Area Economic Development Partnership, 2007).

According to the U.S. Census Bureau (U.S. Census Bureau, American Community Survey [ACS], 2006-2008), the majority of the population the Project area is white, as shown in the Table

above. None of the communities within the Project area counties contain disproportionately high minority populations or low-income populations. The Applicant Preferred Route and the Project area counties contain a lower percentage of minority populations than the state.

Table 5-3 shows the 2006-2008 per capita income and the percentage of the population below the poverty level for the state and counties. The per capita income was nearly 18 percent smaller in Stearns County than the state per capita income. Sherburne and Wright Counties had higher per capita incomes but were still below the state level. An explanation for the low per capita income of the Project area counties relative to the state is presented by the St. Cloud Area Economic Development Partnership, which indicates that the population in the St. Cloud area is younger than the state average. Younger individuals tend to have lower incomes due to educational commitments, part-time jobs and entry-level positions. The poverty level rate of 12.5 percent for Stearns County was also larger than the state poverty rate of 9.7 percent and more than twice the poverty rates of Sherburne and Wright Counties. The per capita income for the area being considered for the Project crossed was similar to the average of the three counties and the poverty rate was closer to Sherburne and Wright Counties than to Stearns County or the state average.

Table 5-3. Economic Characteristics

Location	Per Capita Income (2008 inflation-adjusted dollars)	Percentage of Individuals Below Poverty Level
Sherburne County	$27,577	6.1%
Stearns County	$24,685	12.5%
Wright County	$28,829	5.5%
State of Minnesota	$30,090	9.7%

Source: U.S. Census 2006-2008 ACS estimates.

Historically, the economies of the affected counties have been based in agricultural production. The economic base for counties and communities within the Project area are manufacturing, service establishments, and agricultural industries. The largest industry in Stearns County in terms of employment is trade, transportation and utilities, which employs nearly 27 percent of the workforce. The second largest industry in terms of employment is manufacturing, employing 19 percent of the workforce. Finally, education and health care is the third largest sector of employment, with roughly 17 percent of the workforce. Compared to Minnesota, Stearns County is slightly more concentrated in the manufacturing industry.

5.2.2 Potential Impacts

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

The construction, operation, and maintenance of the substations and transmission line are not anticipated to negatively impact socioeconomic resources in the Project area.

Immediate short-term positive economic gains would likely result from activities associated with construction of the proposed Project. Temporary construction jobs would provide a one-time influx of income to the area. Up to 50 workers could be required for transmission line construction. An additional 25 workers may be required for substation construction. The transmission crews are expected to spend approximately 12 months constructing the transmission line and 16 months constructing the substation. Multiple construction crews are anticipated. During construction, there could be a minor positive impact on the local community due to the expenditures of the construction crews.

Other local businesses such as ready-mix concrete and gravel suppliers, hardware stores, welding and machine shops, packaging and postal services, and heavy equipment repair and maintenance service providers may also benefit from the Project's construction. Local businesses would likely see an increase in revenues from construction, and the number of workers hired from within and outside the Project area may result in positive economic gains in the form of increased wages and spending, lodging, meals, and other consumer goods and services. Construction crews would likely require temporary housing, which may include apartment rentals, hotels, motels, or campgrounds. These types of housing are abundant in the St. Cloud area. Proximity to the Minneapolis and St. Paul area, which is approximately 70 miles from St. Cloud, also offer a large supply of vacant temporary housing.

Impacts to social services would be unlikely because of the short-term nature of the construction phase of the Project. Indirectly, the increased capability and reliability of the electric system to supply energy to the Project area and greater upper Midwest region may contribute to the economic growth of communities in the region

There would be long-term benefits from the Project. Long-term beneficial impacts from the Project would include incremental increases in revenues from utility property taxes. These benefits would include an increase to the state's tax base resulting from the incremental increase in revenues from property taxes, which are based on the value of the facilities. Taxes would be paid based on compliance with all applicable Minnesota and county statutes and regulations. Additionally, landowners would receive compensation for the rights to build, operate and maintain the transmission facilities within the easement area.

Property Values

Concerns regarding potential effects to property values for parcels of land crossed by the alternative routes were voiced by members of the public during project scoping. A number of research studies have been conducted on the effect of HVTL and other energy facilities on residential properties. A literature review was conducted to determine if conclusive impact assessments can be made. These studies included appraiser studies, attitudinal studies, and statistical analyses. None of the studies reviewed during this research provided conclusive findings which could isolate the impacts of transmission lines on property values.

Property values for parcels of land crossed by or adjacent to the proposed transmission line are not anticipated to significantly change. Literature reviews indicate that although value losses up to 20 percent have been reported (EPRI, 2003), study results are highly dependent on methodology and location. Numerous studies have found that property values in parcels neighboring transmission lines are more dependent on traditional assessment categories, such as location, house size, and amenities, rather than the presence of a transmission line. Impacts are the greatest for agricultural lands where the transmission lines interfere with cultivating paths and spraying practices, high-end vacation properties, and small homesteads. Loss of value for residential parcels results from concern about health and visual impacts. However, impacts typically diminish within 10 years of transmission line construction. Positive impacts to property values can occur when transmission line ROWs are allowed to be cultivated or developed into creational areas (Cowger, 1996 and Wisconsin Public Service Commission, 2000).

Several of the studies reviewed indicated that property value losses have been experienced, but decreases in property values are typically minor and the amount of decrease is dependent on the unique circumstances of the each property. A literature review and statistical analysis conducted in 2008 reviewed a number of studies conducted between 1984 and 2007 and evaluated the effect on property values from HVTL in Connecticut and Massachusetts (Voorvaart and Chalmers, 2008). The study concluded that there is no evidence of effects on residential real estate values due to either proximity or visibility of HVTL.

Based on the research conducted, it is not anticipated that the proposed transmission line routes evaluated would significantly affect the value of properties adjacent to the proposed transmission lines.

5.2.3 Environmental Mitigation

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

5.3 LAND USE, ZONING, AND PLANNING

The construction and operation of a transmission line can impact existing and planned land uses and local zoning through the conversion of existing land use to transmission line ROW. Within the route alternatives, the majority of land is used for agriculture or is zoned for agricultural use, therefore this land use type would be most likely to be affected by the Project. However, these impacts are anticipated to be limited to pole locations, and the majority of the transmission line ROW could continue to be used for agricultural purposes.

This section discusses the typical land uses and zoning requirements in the area of the project, and describes the amount of zoned land use and the potential impacts to those land uses as a result of the project.

5.3.1 Affected Environment

The land use study area includes all land within the routes and adjacent properties. Land uses in this area include agricultural, residential, and commercial uses. Agricultural uses predominate; commercial uses are located in and adjacent to the incorporated areas of Monticello, Becker, Clearwater, St. Augusta, and St. Cloud where development densities are higher. Existing land uses near these incorporated areas include residential, commercial, and industrial uses.

The study area is primarily zoned for agricultural and rural residential uses. The entire study area is zoned by the county or city zoning jurisdictions. Sherburne, Wright, and Stearns counties administer zoning over their respective unincorporated areas. The cities of Monticello, Becker, Clearwater, St. Cloud, and St. Augusta also administer zoning regulations within their city limits. The local area is zoned as general agricultural, agricultural/residential, and suburban/residential.

Table 5-4 shows the acreage of zoning affected by each of the alternative 1,000-foot routes. Zoning in the routes is also reflective of the existing land uses in the area. The majority of land use and zoning that would be affected by any of the alternatives is agricultural.

Table 5-4. Zoning Within Each Route (Acres)

	Acres and Percentage of Zoned Land Use						
	Agriculture	Commercial	Municipal	Industrial	Recreation/ Park	Residential	Special Protection Agriculture
Applicant Preferred Route	3,625 79%	108 2%	36 1%	352 8%	164 4%	265 6%	20 .4%
Route A	4,174 87%	44 1%	47 1%	212 4%	129 3%	88 2%	103 2%
Route B	4,044 88%	13 .3%	47 1%	182 4%	70 2%	160 3%	87 2%
Route C	3,905 85%	13 .3%	47 1%	182 4%	70 2%	299 6%	87 2%
Route D	2,909 72%	60 1%	82 2%	632 16%	246 6%	80 2%	19 .5%
Quarry Substation Site 3 with 115 kV Interconnect	231 54%	0	61 14%	0	36 8%	6 1%	97 23%

5.3.2 Potential Impacts

Zoning within each route is illustrative of the type of land use that could be impacted by the ultimate 150-foot transmission line alignment (see Section 5.3.1). Specific alignment alternatives are not available for all routes; however, a qualitative evaluation of land use impacts can be made by determining the type of uses that are likely to be affected by an alignment. Quantitative data on specific alignments is also provided for the three levels of alignments proposed within the Applicant Preferred Route, Route A, and a portion of Route D. These alignments consider ROW sharing with transportation routes, specifically with Interstate 94. The maximum ROW occupancy alignment proposes an alignment within the 5 feet of ROW. The minimum ROW occupancy alignment proposes an alignment within 25 feet of the interstate ROW. A third option, the no ROW occupancy alignment, proposes no ROW sharing with Interstate 94.

Applicant Preferred Route

The Applicant Preferred Route crosses Wright and Stearns counties and several incorporated cities including Monticello, Clearwater, and St. Cloud. Within this route, nearly 80 percent of land is zoned for agricultural uses and less than 10 percent of land within the route is zoned for industrial/commercial or residential uses. The residential uses affected are primarily single-family rural residential parcels located intermittently along the route, but a concentration of residential land uses is located near the intersection of Interstate 94 and Minnesota Highway 24. Most industrial and commercial uses are located near the interchanges with Interstate 94, such as at

Minnesota Highway 24, 15, and 23. Commercial and industrial uses are also concentrated near St. Cloud and Monticello. Municipal, recreation, and special protection agriculture land would be minimally affected. Recreation land affected is located at Fuller Lake east of Clearwater.

As shown in Table 5-6, the ROW occupancy alignments proposed within the Applicant Preferred Route would have similar impacts on land use. Nearly 80 percent of land use affected would be in agricultural zoning, however, some commercial or industrial uses located within 5 feet or 25 feet of the interstate ROW at the Interstate 94 interchanges would also be affected. Compared to the no occupancy alternative, the maximum or minimum ROW occupancy options could cause greater conflicts with commercial or industrial land uses at interchanges with Minnesota Highway 8 and County Road 7 in St. Cloud and along the north side of Interstate 94 east of Clearwater because of the close proximity of some businesses to the interstate ROW. In these areas, the no ROW occupancy alternative would result in fewer conflicts with existing commercial or industrial operations because the alignment would be located away from the ROW. However, throughout the remaining alignment sections of the route, the minimum and maximum ROW occupancy alignments would impact less land and fewer acres of agricultural land use.

Table 5-5. Zoned Land Use Affected by ROW occupancy Alignments for Applicant Preferred Route

	Acres and Percentage of Zoned Land Use in ROW occupancy Alignments						
	Agriculture	Commercial	Municipal	Industrial	Recreation/ Park	Residential	Special Protection Agriculture
Maximum ROW Occupancy	407 79.0%	17 3.3%	4 <1%	39 7.6%	19 3.7%	30 5.8%	<1 <1%
Minimum ROW Occupancy	410 79.6%	18 3.5%	4 <1%	34 6.6%	19 3.7%	30 5.8%	<1 <1%
No ROW Occupancy	420 79.4%	14 2.6%	4 <1%	38 7.2%	18 3.4%	35 6.6%	<1 <1%

Route A

Route A, like the Applicant Preferred Route, also crosses Wright and Stearns counties affecting the cities of Monticello, Clearwater, and St. Cloud as well as surrounding townships. Areas that are zoned for agriculture make up the majority of land affected by the route with an even higher percentage than the Applicant Preferred Route (87 percent compared to 79 percent). Within Route A, nearly 90 percent of land is zoned for agricultural uses. Less than 5 percent of land within the route is zoned for industrial/commercial or residential uses. As with the Applicant Preferred Route, most industrial and commercial uses are located near the Interstate 94 corridor and the incorporated areas. Commercial zoning classifications along Route A reflect businesses along the Interstate 94 corridor and businesses within the cities and townships that Route A

crosses. Commercial and industrial land uses are not as prominent along Route A (one and four percent, respectively) compared to the Applicant Preferred Route (two and eight percent, respectively). Similar to the Applicant Preferred Route, minimal county-identified municipal area, recreation uses, and special protection agriculture land would be affected

As shown in Table 5-6, the ROW occupancy alignments proposed within Route A would have similar impacts on land use. Nearly 90 percent of land use affected would be in agricultural zoning. The maximum and minimum ROW occupancy alignments would have similar effects on agricultural and residential land uses; however, location within 5 feet or 25 feet of the interstate ROW at interchanges could interfere with some commercial or industrial uses compared to the no ROW occupancy alternative. The maximum or minimum interstate route sharing options could cause greater conflicts with commercial or industrial land uses at the I-94 and Minnesota Highway 8 interchange because these uses occupy land situated close to the interchange footprint. Similar impacts would also occur west of the Interstate 94 and Minnesota Highway 24 interchange. The no ROW occupancy alternative at these locations would affect additional agricultural land, but would result in fewer conflicts with existing commercial or industrial operations. However, throughout the remaining alignment that is not near interchanges, the minimum and maximum ROW occupancy alignments would impact less land and fewer acres of agricultural land use.

Table 5-6. Zoned Land Use Affected by ROW occupancy Alignments for Route A

	Acres and Percentage of Zoned Land Use in ROW occupancy Alignments						
	Agriculture	Commercial	Municipal	Industrial	Recreation/ Park	Residential	Special Protection Agriculture
Maximum ROW occupancy	518 88.2%	6 1.0%	3 <1%	18 3.1%	12 2.0%	13 2.2%	17 2.9%
Minimum ROW occupancy	523 89.1%	7 1.2%	3 <1%	11 1.9%	13 2.2%	12 2.0%	17 2.9%
No ROW occupancy	531 88.8%	8 1.3%	3 <1%	11 1.8%	16 2.7%	12 2.0%	17 2.8%

Route B

Unlike the Applicant Preferred Route, the transmission line along Route B is designed to avoid collocation with I-94 by making use of property lines, cross country segments, and county roads. Other components such as existing 115 kV lines are also taken into consideration. Zoning and land use effects within the B route are similar to those in the A route. Nearly 90 percent of land within the 1,000-foot route is zoned for agricultural uses. Less than 5 percent of land within the route is zoned for industrial/commercial while residentially zoned land is slightly higher in Route B at 6 percent. The smaller amount of industrial and commercial land affected, compared to the Applicant Preferred Route and Route A, reflect the areas where Route B does not follow

Interstate 94. Municipal, recreation, and special protection agriculture land would be minimally affected.

Route C

Since Route C primarily follows Routes A and B, land use effects on are similar to those two routes. Within Route C, 85 percent of land is zoned for agricultural uses. Industrial zoned land accounts for 4 percent of the route, while residential accounts for 6 percent. The slightly higher amount of residential acreage affected reflects where this alternative route leaves the Route A and B alignment in Silver Creek Township. Municipal, recreation, and special protection agriculture land would be minimally affected.

Route D

Within Route D, 72 percent of the land potentially affected is zoned for agricultural uses. Land zoned for industrial uses represents 16 percent of the route and is primarily located in an industrial park in Becker. Municipal and residential land accounts for 1 percent and 2 percent, respectively, of the route. Recreation land accounts for 6 percent of the route, and is mainly reflective of the open space areas along the Mississippi River.

Quarry Substation Site 1

The Quarry Substation Site 1 is nearly 100 acres of land zoned for agriculture. Less than one half of 1 percent is zoned for residential and reflects the one existing residence located there. The substation will ultimately be located within the approved siting area so as to avoid the displacement of this residence.

Quarry Substation Site 2

The Quarry Substation Site 2 consists of nearly 300 acres, 80 percent of which is zoned for agricultural uses and approximately 20 percent for residential uses. Location of the substation would avoid the existing residence located within this siting area.

Quarry Substation Site 3 and the 115 kV Interconnect

Quarry Substation Site 3 and the 115 kV Interconnect include 273 acres and 343 acres, respectfully. The substation alone accounts for just 13 acres. The additional acreage included is within the approximately one and a half mile interconnecting route that would be required to connect with the existing St. Cloud to Sauk River 115 kV transmission line. Quarry Substation Site 3 with Route Interconnect A primarily affects agricultural land uses, but 36 acres of municipal land and 35 acres of recreation land are also affected. Nearly 50 percent of Quarry Substation 3 and the 115 kV interconnect is in agricultural land use; but this option also affects recreation and land designated as special agricultural. Both options affect a very small amount of residential land use.

5.3.3 Mitigation

Existing land uses in proximity to any of the routes are not expected to change as a result of construction and operation of the proposed transmission line. In agricultural areas, the majority of land underneath the transmission lines could still be used for agricultural purposes. Minor

permanent impacts on land use will be incurred due to the small loss of land around each pole. The Applicant will purchase ROW easements for private property crossed by the transmission line in accordance with state and federal land acquisition requirements. In addition, the transmission line alignment will be designed to avoid structures to the extent practical (see Section 5.4). No additional mitigative measures are necessary relative to land use.

5.4 DISPLACEMENT

Displacement of residences and commercial or industrial properties can occur when the tranmission line ROW cannot avoid such structures. In such a situation, the property including the structures on it are acquired, and the occupant(s) of the structures are relocated to a new residence or business location, No likely displacement locations within the proposed ROWs were identified. This section also identifies structures within the 1,000 foot route and 150 foot ROW.

5.4.1 Affected Environment

The study area relating to displacements is predominantly agricultural and rural residential with the exception of the incorporated communities where development is more concentrated. . Displacement can occur when a residence is located within the ROW for a new transmission facility; that is, when it is located within a distance that will interfere with safe operation of the transmission line. Potential displacements in the study area would primarily be single-family residences located in areas where manmade and natural features and specific route needs would not allow the transmission line route to avoid the structure or would make the property unusable for residential purposes. Other nonresidential buildings are also located within the transmission line routes which include commercial buildings and residential accessory structures.

A ROW of 150 feet would be required for the Monticello to St. Cloud 345 kV Transmission Line Project; however, a 1,000-foot route has been evaluated for potential impacts. NESC and Applicant standards require certain clearances between transmission line facilities and buildings for safe operation of the transmission line. Applicants acquire a ROW for transmission lines that is sufficient to maintain these clearances.

5.4.2 Potential Impacts

Table 5-7 shows the number of residential and nonresidential structures within the 1,000-foot routes for each alternative and within 500-feet of the proposed ROW centerline for each route. To the extent feasible, the proposed 345 kV transmission line will be designed so that all existing residences are located outside of the required ROW.

Table 5-7. Structures Affected by Routes and Alignments

Alternative	Structures Within 1,000-Foot Routes and Substation Areas		Residences within Proximity of Alignment (Feet)				
	Residences	Nonresidential Structures	0-75	75-150	150-300	300-500	Total within 500
Applicant Preferred Route	109	199	NA	NA	NA	NA	NA
Maximum ROW occupancy	NA	NA	0	3	22	37	62
Minimum ROW occupancy	NA	NA	0	5	20	36	61
No ROW occupancy	NA	NA	0	5	30	31	66
Route A	108	219	NA	NA	NA	NA	NA
Maximum ROW occupancy	NA	NA	0	21	37	26	84
Minimum ROW occupancy	NA	NA	0	21	38	26	85
No ROW occupancy	NA	NA	0	22	43	30	95
Route B	120	201	0	30	51	39	120
Route C	147	228	0	36	66	45	147
Route D	108	145	0	8	19	32	59
Quarry Substation Site 1	1	2	NA	NA	NA	NA	NA
Quarry Substation Site 2	1	10	NA	NA	NA	NA	NA
Quarry Substation Site 3 and 115 kV interconnect	8	8	NA	NA	NA	NA	NA
Maximum ROW occupancy	NA	NA	0	4	9	7	20
Minimum ROW occupancy	NA	NA	0	4	9	7	20
No ROW occupancy	NA	NA	0	4	9	6	19

Applicant Preferred Route

There are 109 residences located within the Applicant Preferred Route; between 61 and 66 of these residences are located within 500 of the ROW centerline, depending on the ROW occupancy scenario. No residences are located with 75 feet of this alignment. The actual 150-

foot alignment could be designed to avoid residential displacements. Residential densities in the Applicant Preferred Route are low, and it is expected that the ultimate alignment could be located to avoid all residences. Therefore, residential displacements are not anticipated to occur under the Applicant Preferred Route Alternative.

The route also contains 199 nonresidential structures which include out buildings, agricultural buildings, other accessory structures, and commercial and industrial buildings. These buildings have a greater potential to be displaced through ROW acquisition; however, nonresidential buildings could also be avoided in the final ROW design.

Route A

There are 108 residences located within Route A; between 84and 95 of these residences are located within 500 feet of the ROW centerline, depending on the ROW occupancy scenario. No residences are located with 75 feet of this alignment. The actual 150-foot alignment could be designed to avoid residential structures. Residential densities in this route are low, and it is expected that the ultimate alignment could avoid all residences. Therefore, residential displacements are not anticipated to occur under Route A.

The route also contains 219 nonresidential structures which include out buildings, agricultural buildings, other accessory structures, and commercial and industrial buildings. These buildings have a greater potential to be displaced through ROW acquisition; however nonresidential buildings could also be avoided in the final ROW design.

Route B

Within Route B, there are 120 residences; however, the actual 150-foot alignment could be designed to avoid these structures. Residential densities in this route are low, and it is expected that the ultimate alignment could avoid all residences. Therefore, residential displacements are not anticipated to occur under Route B. The route also contains 201 nonresidential structures which include out buildings, agricultural buildings, other accessory structures, and commercial and industrial buildings. These buildings have a greater potential to be displaced through ROW acquisition; however, nonresidential buildings could also be avoided in the final ROW design.

Route C

Within Route C, there are 147 residences; however the actual 150-foot alignment could be designed to avoid residences. Residential densities in this route are low, and it is expected that the ultimate alignment could avoid all residences. Therefore, residential displacements are not anticipated to occur under this alternative. The route also contains 228 nonresidential structures which include out buildings, agricultural buildings, other accessory structures, and commercial and industrial buildings. These buildings have a greater potential to be displaced through ROW acquisition; however nonresidential buildings could also be avoided in the final ROW design.

Route D

Within Route D, there are 108 residences; however, to the extent feasible, the 150-foot alignment could be designed to avoid residences and nonresidential buildings. Residential densities in this route are primarily low and many options are available in this route for

avoidance of residential and commercial displacements. Two pinch points are located within Route D where several residences are closely situated within the route corridor. These areas are located in Clear Lake Township, in Sherburne County, and shown in Figure 5-1. However, residences in these areas can be avoided by crossing the existing the existing 115 kV transmission line and clearing trees in some areas.

Approximately 67 nonresidential buildings are also located within Route D. These structures include out buildings, agricultural buildings, other accessory structures, and commercial and industrial buildings and have a greater potential to be displaced through ROW acquisition. Nonresidential buildings, however, could also be avoided in the final ROW design.

Quarry Substation Site 1

There is 1 existing residence and 2 nonresidential buildings located within the Proposed Quarry Substation Site 1 Siting Area; however, the substation could ultimately be located within the approved siting area so as to avoid the displacement these structures.

Quarry Substation Site 2

There is 1 existing residence and 10 nonresidential buildings located within the Proposed Quarry Substation Site 2. The substation could ultimately be located within the approved siting area so as to avoid these structures.

Quarry Substation Site 3 and the 115 kV Interconnect

There are 8 residences and 8 non residential buildings located within Quarry Substation Site 3and the 115 kV interconnect. The actual 150-foot alignment could be designed to avoid residences. Therefore, no displacement impacts are likely to occur with either of these options.

5.4.3 Mitigation

Landowners would be compensated for easements and parcel acquisitions for the project. As described, no residential displacements are anticipated, and nonresidential structure displacements are unlikely. If avoidance cannot be achieved, landowners would be relocated and compensated for all easements and parcel acquisitions.

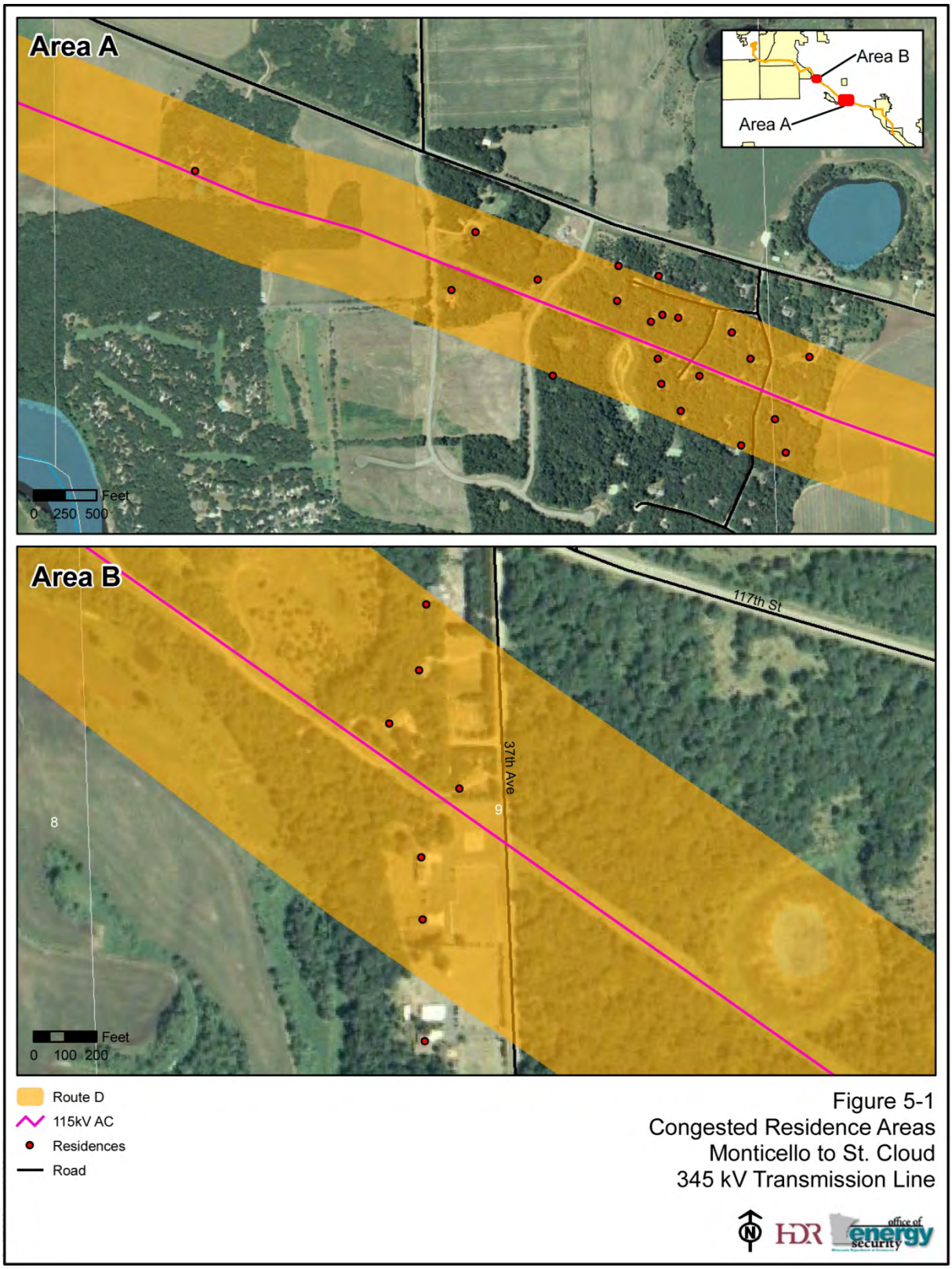


Figure 5-1
Congested Residence Areas
Monticello to St. Cloud
345 kV Transmission Line

5.5 LAND BASED ECONOMICS

The primary land based economy in the area of the project is agriculture. Agricultural impacts are an important issue with respect to economics, soil, and land use which are covered in Section 5.3. This section discusses the potential project impacts on farming as well forestry.

5.5.1 Affected Environment

The proposed Project has the potential to impact various aspects of resources relating to land-based economics such as farming. Construction and operation of the Project would disturb land, generate revenue, and create jobs in the Project area counties.

Agriculture, mining, and forestry have historically been major industries in the State of Minnesota. Minnesota's geographical location at the west end of Lake Superior and along navigable portions of the Mississippi and Minnesota Rivers is what first connected its resources to world markets. In the early years of immigration, these were also the main routes of bulk transportation that made the lumber industry and agriculture profitable. Beginning in the 1830s, railroads provided a new mode of bulk transportation. Railroads first connected established markets, and then began to spread away from waterways in response to the demands of industries such as lumber and mining. In 1884, iron mining emerged as a major industry that depended on the bulk transportation of the railroads and that would play a major role in the Minnesota economy for nearly a century. Like the lumbering industry, the major centers of the iron ore industry were in northern Minnesota.

Agriculture, mining, and forestry are still present in the state's current economy. This section covers land based economics for agriculture and forestry.

According to the U.S. Department of Agriculture in 2007 there were 265,376 acres of farmland (63 percent of total land) in Wright County and the market value of agricultural products sold was $140 million. In 2007, Stearns County had 708,284 acres of farm land (82 percent of total land) and the market value of agricultural products sold was $519 million. Sherburne County had 106,127 acres of farm land (38 percent of total land) and the market value of agricultural products sold was $64 million in the year 2007 (USDA, 2007). Primary crops in the area are corn, soybeans, oats, and spring wheat. The general area is mostly planted in corn and soybeans, According to the Minnesota Department of Employment and Economic Development (DEED).

Prime farmland resources are an important contribution to the land based economics of the Project Area for the three counties that are traversed by the proposed routes. The USDA Natural Resources Conservation Service (NRCS) provides soil surveys with detailed soil geographic data developed by the National Cooperative Soil Survey. The purpose of the data is to provide consistent soil mapping data and provides an inventory of important farmlands. Agricultural land designated as 'prime farmland,' indicates land that is most desirable for agricultural production. According to Federal regulation prime farmland is defined as, "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses" (7 CFR, 657.5 (a) (1)). Further land that is designated as 'farmland of statewide importance' is, "land; in addition to prime and

unique farmlands, that is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods" (7 CFR, 657.5 (c). Table 5-8 presents the acreage of prime farmland classifications present within each route and substation siting area.

Table 5-8. Prime Farmland Within Routes

Proposed Routes and Substations	All areas are prime farmland (acres)
Applicant Preferred Route	324
Route A	411
Route B	447
Route C	450
Route D	88
Quarry Substation Site 1	-
Quarry Substation Site 2	-
Quarry Substation Site 3 and 115 kV Interconnect	2

**If protected from flooding or not frequently flooded during the growing season.*
**USDA Data for 1000 ft wide routes and substation siting areas*

Agricultural lands are also included in the land cover data presented in Section 5.1. The land cover data is part of the Upper Midwest Gap Analysis Program (UMGAP) of the U.S. Geological Survey. The data is based on aerial photograph interpretation of land cover and organizes agricultural lands in to cropland and grasslands. See Section 5.1 for agricultural land cover for each route. Permanent and temporary impacts to agricultural lands as defined by land cover to the project ROW are presented in Section 5.5.2. A map of agricultural lands and center pivot irrigation systems for agricultural production is located Appendix G.

According to DEED, Wright County had an average of 433 employees in Mining and Natural Resources (agriculture, forestry, fishing and hunting), Stearns County averaged 801 employees and Sherburne County averaged 358 in the 2008.

Undisturbed wooded or forested areas are rare. Several wooded and forested land cover areas within the regional area include dry, mesic, and wet forests. Forest resources, notably existing tree stands, are present along the proposed routes; however, these wooded areas are not commercial forestry operations. The majority of the trees within these woodlands is second or third growth. Table 5-9 presents the acreage of wooded areas identified using the USGS 2001 National Land Cover Dataset.

Table 5-9. Wooded Areas Within Routes

Proposed Routes and Substations	Wooded Areas (acres)
Applicant Preferred Route	155
Route A	238
Route B	262
Route C	215
Route D	292
Quarry Substation Site 1	0
Quarry Substation Site 2	0.08
Quarry Substation Site 3 and 115 kV Interconnect	0

**If protected from flooding or not frequently flooded during the growing season.*
**USGS 2001 Data for 1000 ft wide routes and substation*

5.5.2 Potential Impacts

The Project would result in permanent and temporary impacts to agricultural lands but no measurable impacts would occur on prime farmlands. Permanent impacts would occur as a result of structure placement along the route or the transmission line and the addition of any access roads. Temporary impacts are caused by construction, staging, and stringing operations. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur. Permanent impacts in agricultural lands are estimated at 55 square feet per pole. Temporary construction impacts in agricultural fields are estimated at one acre per span. Impacts to agricultural lands are calculated for soils (prime farmlands) and land cover (croplands and grasslands) for the project ROW. There are three ROW occupancy scenarios (maximum occupancy, minimum occupancy, and no occupancy) for the routes that travel along the I-94 corridor (see Section 1.5). Impacts to these occupancy scenarios are presented for alignments that travel along the interstate.

Minnesota's forestry industry is concentrated in the northeastern portion of the state. There are no townships within any of the proposed routes or substation sites that have timber harvest plans, according to the MnDNR Forestry Division Fiscal Year 2010 Harvest Plans. No impacts on commercial forest resources or economically important forestry would occur. Impacts on forested lands have been minimized by designing the route to avoid wooded areas to the extent feasible.

Applicant Preferred Route

Agriculture - The Applicant Preferred Route would result in permanent and temporary impacts to agricultural lands but no measurable impacts would occur on prime farmlands. Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the

transportation route. The maximum interstate ROW occupancy alignment proposes an alignment within the 5 feet of ROW. The minimum interstate ROW occupancy alignment proposes an alignment within 25 feet of the interstate ROW. A third option, the no interstate ROW occupancy alignment proposes no occupancy within the existing interstate ROW. Refer to Table 5-10. Agricultural Impacts for the acreage of agricultural land impacted by each ROW occupancy scenario.

Table 5-10. Agricultural Impacts – Applicant Preferred Route

Applicant Preferred 150 ft ROW	Maximum Interstate Corridor Occupancy (acres)	Minimum Interstate Corridor Occupancy (acres)	No Interstate Corridor Occupancy (acres)
Agricultural Lands* (Grasslands and Croplands Land Cover)	389	403	435
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	0.18	0.19	0.20
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	160	152	146

**GAP Data*
*** USDA Soils Data*

The Applicant Preferred Route includes three center pivot irrigation systems. Based on the potential ROW occupancy alternatives, one of the three center pivot irrigation system would be impacted by the ROW occupancy scenarios.

Forestry - Impacts on wooded lands have been minimized by locating the Applicant Preferred Route to minimize tree clearing to the extent feasible. Forest resources, notably existing tree stands, are present along the Applicant Preferred Route. The Applicant Preferred Route would cross 567 acres of wooded lands. The wooded areas are located primarily on privately held lands. Warner Lake County Park, located along the Applicant Preferred Route, west of Clearwater, is publicly owned and encompasses woods, Warner Lake, roads, trails, and a nature center. The wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not necessarily commercial forestry operations. The majority of the trees within these woodlands is second or third growth. In general, temporary construction and permanent impacts on forest resources would occur at locations where trees would be cleared within the ROW.

Although specific alignments have not yet been determined, I-94 ROW occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation route. Refer to Table 5-11 for impacts on wooded areas associated with the Applicant Preferred route with each ROW occupancy scenario.

Table 5-11. Wooded Area Impacts – Applicant Preferred Route

Applicant Preferred Route 150 ft ROW	ROW Wooded Areas (acres)	ROW Percent Wooded Areas
Maximum Interstate ROW occupancy	6.9	1.3%
Minimum Interstate ROW occupancy	8.9	1.7%
No Interstate ROW occupancy	11.2	2.1%

Route A

Agriculture - Route A would result in permanent and temporary impacts to agricultural lands but no measurable impacts would occur on prime farmlands. Similar to the Applicant Preferred Route, I-94 ROW occupancy alignments proposed within Route A reflect the co-location of the transmission line with the transportation route. The maximum interstate ROW occupancy alignment proposes an alignment within the 5 feet of ROW. The minimum interstate ROW occupancy alignment proposes an alignment within 25 feet of the interstate ROW. A third option, the no interstate ROW occupancy alignment proposes no occupancy within the existing interstate ROW. Refer to Table 5-12 for the acreage of agricultural land impacted by each ROW occupancy scenario.

Table 5-12. Agricultural Impacts – Route A

Route A 150 ft ROW	Maximum Interstate Corridor Occupancy (acres)	Minimum Interstate Corridor Occupancy (acres)	No Interstate Corridor Occupancy (acres)
Agricultural Lands* (Grasslands and Croplands Land Cover)	491	499	523
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	0.23	0.23	0.24
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	190	183	180

**GAP Data*

*** USDA Soils Data*

Route A includes eight center pivot irrigation systems. Based on the potential occupancy sharing opportunities, five center pivot irrigation systems would be impacted by each ROW occupancy scenario.

Forestry – Forest resources, notably existing tree stands, are present along Route A. The forest resources are located primarily on privately held lands. Like the Applicant Preferred Route, the route for Route A would cross Warner Lake County Park in Clearwater. Wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not necessarily commercial forestry operations. In general, temporary

construction and permanent impacts on forest resources would occur at locations where trees would be cleared within the ROW.

Although specific alignments have not yet been determined, I-94 ROW occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation route. Refer to Table 5-13 for impacts on wooded areas associated with the Route A with each ROW occupancy scenario.

Table 5-13. Wooded Area Impacts – Route A

Route A 150 ft ROW	ROW Wooded Areas (acres)	ROW Percent Wooded Areas
Maximum Interstate ROW occupancy	18	3.0 %
Minimum Interstate ROW occupancy	19	3.2 %
No Interstate ROW occupancy	18.5	3.0 %

Route B

Agriculture – Route B would result in permanent and temporary impacts to agricultural lands but no measurable impacts would occur on prime farmlands. Permanent impacts in agricultural lands are estimated at 55 square feet per pole. Temporary construction impacts in agricultural fields are estimated at one acre per span. Temporary impacts during construction may include soil compaction, disruption of agricultural practices (*e.g.*, center pivot irrigation) and crop damages within the ROW at proposed structure locations, locations of permanent access, and other work areas. Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Refer to Table 5-14. Agricultural Impactsfor the acreage of agricultural land impacted by the proposed ROW.

Table 5-14. Agricultural Impacts – Route B

Route B 150 ft ROW	Acres
Agricultural Lands* (Grasslands and Croplands Land Cover)	550
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	0.26
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	201

**GAP Data*
*** USDA Soils Data*

Route B route includes ten center pivot irrigation systems. The proposed 150 foot wide ROW would impact nine center pivot irrigation systems.

Forestry - Under the Route B option, no impacts to forested areas or economically important forestry would occur. Forest resources, notably existing tree stands, are present along Route B. The forest resources are located primarily on privately held lands. Like the Applicant Preferred Route, the route for

Route B would cross Warner Lake County Park in Clearwater; however the route would cross the southwest corner of the park.

Applicants are requesting a 150 foot ROW, 75 feet on either side of an alignment. Based on this requirement, a total of 34 acres of wooded areas, or 5.4 % of wooded areas in the route would be impacted by Route B. Wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not generally commercial forestry operations. In general, temporary construction and permanent impacts on forest resources would occur at locations where trees would be cleared within the ROW.

Route C

Agriculture - Route C would result in permanent and temporary impacts to agricultural lands but no measurable impacts would occur on prime farmlands. Permanent impacts in agricultural lands are estimated at 55 square feet per pole. Temporary construction impacts in agricultural fields are estimated at one acre per span. Temporary impacts during construction may include soil compaction, disruption of agricultural practices (***e.g.***, center pivot irrigation) and crop damages within the ROW at proposed structure locations, locations of permanent access, and other work areas. Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Refer to Table 5-15. Agricultural Impactsfor the acreage of agricultural land impacted by the proposed ROW.

Table 5-15. Agricultural Impacts – Route C

Route C 150 ft ROW	Acres
Agricultural Lands* (Grasslands and Croplands Land Cover)	551
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	0.26
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	201

**GAP Data*

*** USDA Soils Data*

Route C includes seven center pivot irrigation systems. The proposed 150 foot wide ROW would impact six center pivot irrigation systems.

Forestry – Under the Route C option, no impacts to forested areas or economically important forestry would occur Forest resources, notably existing tree stands, are present along Route C as similar to Route B. Resources and impacts would be similar to those discussed for Route B. Additionally, where the route varies from Route B in Silver Creek Township, it travels across the Harry Larson Memorial Wright County Forest. The forest is preserved for recreation and not commercial forestry operations.

Applicants are requesting a 150 foot ROW, 75 feet on either side of an alignment. Based on this requirement, a total of 29 acres of wooded areas, or 7% of wooded areas in the route would be impacted by Route C. Wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not generally commercial forestry operations. In general, temporary construction and permanent impacts on forest resources would occur at locations where trees would be cleared within the ROW. The proposed ROW for Route C permanently impacts approximate 12 acres along the southern border of the Harry Larson Memorial Wright County Forest on 127th Street N which represents less than five

of the forest. Spanning this segment of the forest could minimize impacts to the county forest but vegetation removal would still occur.

Route D

Agriculture – Route D would result in permanent and temporary impacts to agricultural lands but no measurable impacts would occur on prime farmlands. Permanent impacts in agricultural lands are estimated at 55 square feet per pole. Temporary construction impacts in agricultural fields are estimated at one acre per span. Temporary impacts during construction may include soil compaction, disruption of agricultural practices (*e.g.*, center pivot irrigation) and crop damages within the ROW at proposed structure locations, locations of permanent access, and other work areas. Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Refer to Table 5-15. Agricultural Impactsfor the acreage of agricultural land impacted by the proposed ROW.

Table 5-16. Agricultural Impacts – Route D

Route D 150 ft ROW	Acres
Agricultural Lands* (Grasslands and Croplands Land Cover)	429
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	0.20
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	156

**GAP Data*
*** USDA Soils Data*

Route D includes 36 center pivot irrigation systems. The proposed 150 foot wide ROW would impact 24 center pivot irrigation systems.

Forestry – Where Route D travels on the east side of the Mississippi River it occurs entirely within the Anoka Sand Plain subsection of the Eastern Broadleaf Forest. Under the Route D option, no impacts to forested areas or economically important forestry would occur. Forest resources, notably existing tree stands, are present along Route D as similar to the other alternatives. In general, temporary construction and permanent impacts on forest resources would occur at locations where trees would be cleared within the ROW. The majority of the route travels along an existing transmission line route which could minimize impacts to forest resources.

Applicants are requesting a 150 foot ROW, 75 feet on either side of an alignment. Based on this request, a total of 33 acres of wooded areas, or 9 % of wooded areas in the route would be impacted by Route D. Wooded areas that are privately owned may be selectively cut periodically for firewood, timber, or pulpwood. However, these wooded areas are not generally commercial forestry operations. In general, temporary construction and permanent impacts on forest resources would occur at locations where trees would be cleared within the ROW.

Quarry Substation Site 1

Agriculture – While none of the soils present at the site are presently designated as prime farmlands the, Quarry Substation Site 1 would have permanent impacts on agricultural land based on land cover which includes croplands and grasslands at the site. A minimum of six acres

would be permanently removed from existing land uses. There are no center pivot irrigation systems in the proposed siting area.

Forestry – The proposed Quarry Substation Site 1 is located primarily in agricultural land with no areas of commercial forestry within one mile.

Quarry Substation Site 2

Agriculture – While none of the soils present at the site are presently designated as prime farmlands, the Quarry Substation Site 2 would have permanent impacts on agricultural land based on land cover which includes croplands and grasslands at the site. A minimum of six acres would be permanently removed from existing land uses. There are no center pivot irrigation systems in the proposed siting area.

Forestry – The proposed Quarry Substation Site 2 is located primarily in agricultural land with no areas of commercial forestry within one mile.

Quarry Substation Site 3 and the 115 kV Interconnect

Quarry Substation Site 3 would be up to 15 acres in size to allow for the interconnection of the proposed 345 kV transmission line, an existing 115 kV transmission line, and future high voltage transmission lines which would represent a full build out of Quarry Substation Site 3. At this location, six acres would be permanently removed from existing land uses.

Agriculture – The entire Quarry Substation Site 3 is agricultural land and includes soils designated for prime farmland. The 115 kV Interconnect parallels the I-94 corridor similar to the Applicant Preferred Route and Route A. Refer to the table below for potential impacts to agricultural lands by Quarry Substation Site 3 and the 115 kV Interconnect.

Table 5-17. Agricultural Impacts – Quarry Substation Site 3 and the 115 kV Interconnect

Quarry Substation 3 and the 115kV Interconnect	Total Acres Impacted	Maximum Interstate Corridor Occupancy (acres)	Minimum Interstate Corridor Occupancy (acres)	No Interstate Corridor Occupancy (acres)
Agricultural Lands* (Grasslands and Croplands Land Cover)				
Quarry Substation Site 3	12.96	NA	NA	NA
Interconnection				
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	-	0.025	0.023	0.023
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	-	19	18	18
Agricultural Lands (Prime Farmland Soils)**				
Quarry Substation Site 3	2.42	NA	NA	NA
Interconnection				
Permanent Pole Impacts to Agricultural Lands (55SF per pole)	-	0.003	0.003	0.003
Temporary Pole Impacts to Agricultural Lands (1 acre per span)	-	2	2	2

**GAP Data*
*** USDA Soils Data*

There are no center point irrigation systems impacted by the substation or interconnection.

Forestry – The proposed Quarry Substation Site 3 and 115 kV Interconnect is located primarily in agricultural land with no areas of commercial forestry within one mile and no measurable impact on wooded lands.

5.5.3 Mitigation

Agriculture – Mitigation measures would not differ between routes. Landowners would be consulted to minimize impacts to prime farmland, other agricultural land, and farming operations along the route. Impacts to agricultural land can be minimized by aligning the transmission lines along section and field lines as well as existing ROW. Landowners would be compensated for the use of their land through easement payments.

Unavoidable adverse impacts are typically the physical impacts to the land associated with the Project. Permanent impacts to agricultural land resulting from the Project are an unavoidable adverse impact and mitigation measures would be implemented, as described in previous sections and as identified by regulatory agencies, to minimize these unavoidable adverse environmental affects. The significant unavoidable adverse impacts caused by the proposed routes are minimal, but include impacts to agricultural resources.

To minimize loss of farmland and to ensure reasonable access to the land near the poles, Applicants would prefer to place the poles approximately five feet from the road ROW. When possible, Applicants would attempt to construct the transmission line before crops are planted or following harvest. Applicants would compensate landowners for crop damage and soil compaction or damage to drain tile, fences, structures, and landscaping that occurs as a result of the Project. Soil compaction could be addressed by compensating the farmer to repair the ground or by using contractors to chisel-plow the site. Normally, a declining scale of payments is set up over a period of a few years.

To further minimize agricultural impacts where possible, spring time construction could be avoided. However, if construction during spring is necessary, disturbance to farm soil from access to each structure location could be minimized by using the shortest access route. This may require construction of temporary driveways between the roadway and the structure but could limit traffic on fields between structures. Construction mats may also be used to minimize impacts on the access paths and in construction areas.

It is anticipated that the applicants would work with land owners to avoid impacting center-pivot irrigation systems. In Route D which includes the greatest number of center-point irrigation systems there is an existing transmission line, additional permanent impacts are not anticipated and therefore, no mitigative measures are proposed.

Forestry - No impacts to forested areas or economically important forestry would occur as a result of the proposed routes or substations, and therefore, no mitigative measures are proposed. In forested areas, it is anticipated that the Applicant would limit clearing for access roads and staging areas to only those trees necessary to permit the passage of equipment. The Applicant proposes to remove temporary access roads and restore the area to as near its original condition as practicable. The Applicant would also likely mitigate impacts to forest resources at locations where trees would be cleared within the ROW including Harry Larson Memorial Wright County Forest along Route C. It is anticipated that the Applicant would work with the MnDNR to avoid and minimize impacts to any sensitive habitats.

5.6 AESTHETICS

Aesthetic resources are the various elements of the landscape that contribute to the visual character of a place. The visual context of a setting is related to both the natural and built environment. Transmission lines and substations alter this context This section discusses potential impacts of the project on various aesthetic resources.

5.6.1 Affected Environment

The Project study area contains a variety of scenic settings, primarily within open space, parks, and some recreational use areas such as golf courses. These areas are located within the municipal boundaries of communities along the proposed routes, and in unincorporated Wright and Stearns Counties. Several county parks located in close proximity to I-94 offer a variety of outdoor recreational opportunities in scenic settings.

The visual character and quality in the Project area are characterized by its surrounding landscape. The topography of the area is relatively level to sloping land with elevations ranging from 950 to 1030 feet. The route parallels the Mississippi River, and crosses the Clearwater River at the Clearwater interchange along I-94. The proposed 345 kV transmission line would traverse land with mixed uses, but would primarily cross agricultural land. The primary present day landscape vegetation is sod, supporting vegetable agriculture crops, and some open or barren areas. The majority of the regional area encompasses pasture and cropland for corn, mineral sod, soybeans, oats, and spring wheat. Dense residential land use within the Project study area is primarily limited to the St. Cloud and Monticello incorporated areas, with dispersed rural residential uses occurring throughout the area. Concentrations of trees surround the farmsteads along I-94 and sporadic pockets of wooded areas are also present. The primary tree cover within the Project area occurs near the Mississippi Rivers which consists of oak, ash, maple, and elm trees.

The Mississippi River is the dominant natural landform in the vicinity of the Project. Segments of the Mississippi River are designated as either "scenic" or "recreational" districts through the Minnesota Wild and Scenic Rivers Program. The river is designated as "scenic" from St. Cloud to Clearwater, and "recreational" from Clearwater to Monticello. Through the Wild and Scenic Rivers program, a management plan was adopted that protects the river and sets rules for the management of land along the river route. Portions of the Applicant Preferred Route travel through the area designated as a Recreational River District and Route D travels through portions of both the Recreational River District and the Scenic River District. The river is also a designated Canoe and Boating Route from St. Cloud through the Project area. The ultimate location of the proposed 345 kV transmission line is intended to be outside the designated Recreation route.

Great River Road

The Mississippi River provides scenic driving opportunities for motorists in the project area. The Great River Road, a national scenic byway, runs for more than 500 miles along the river, including a portion of the project area, specifically Wright County Highway 75 and Stearns County Highway 75. Construction and operation of a transmission line along these roadways

would likely have an adverse impact to the overall scenic nature of the Great River Road roadway, and could affect future funding opportunities for transportation enhancements. Refer to Appendix G for a map of natural resources associated with the visual context of the project area.

The Great River Road follows the Mississippi River through Minnesota, Wisconsin, Iowa, Illinois, Missouri, Kentucky, Tennessee, Arkansas, Mississippi and Louisiana. In the Monticello to St. Cloud 345 kV transmission line project area, the Great River Road follows Wright County Highway 75 and Stearns County Highway 75 from Monticello to St. Cloud between I-94 and the Mississippi River.

National Scenic Byways, including the Great River Road are supported by National Scenic Byways Discretionary Grants program, which provides merit-based funding for byway-related projects each year. The National Scenic Byways (NSB) Program was established under the Intermodal Surface Transportation Efficiency Act of 1991. Under the program, the U.S. Secretary of Transportation recognizes certain roads as National Scenic Byways or All-American Roads based on six intrinsic qualities, including archaeological, cultural, historic, natural, recreational, and scenic qualities. There are 151 such designated byways in 46 states. (U.S. DOT 2007). According to the National Scenic Byways Program Title 23, Section 131(s) outdoor advertising is regulated along designated scenic byways. While there is no specific language about public infrastructure along scenic byways; the addition of a transmission line and structures would conflict with the program's mission to "provide resources to the byway community to create unique travel experiences and enhance local quality of life through efforts to preserve, protect, interpret, and promote the intrinsic qualities of designated byways."

Oversight of the Great River Road is provided by the Mississippi River Parkway Commission (MRPC). The MRPC is a multi-state organization which works collectively to preserve, promote, and enhance the scenic, historic, and recreational resources of the Mississippi River, to foster economic growth in the corridor, and to develop the Great River Road. The National MRPC is a 501 (c) 3 non-profit organization. The general membership gathers twice each year at an Annual and Semi-Annual meeting. Individual state commissions, which include the Minnesota MRPC (MN-MRPC) meet quarterly or as their work plan dictates.

The MN-MRPC, which has primary responsibility for managing the Minnesota portion of the Great River Road, prepared a Great River Road Development Study in 2000, which discusses the ability of the Great River Road to support tourism in Minnesota. The study identified seven destination areas along the Great River Road; the Monticello to St. Cloud 345 kV transmission line project lies within the Mississippi State Scenic River destination area. See Section 5.10 of this EIS for a detailed discussion of the scenic river environment and potential impacts.

5.6.2 Potential Impacts

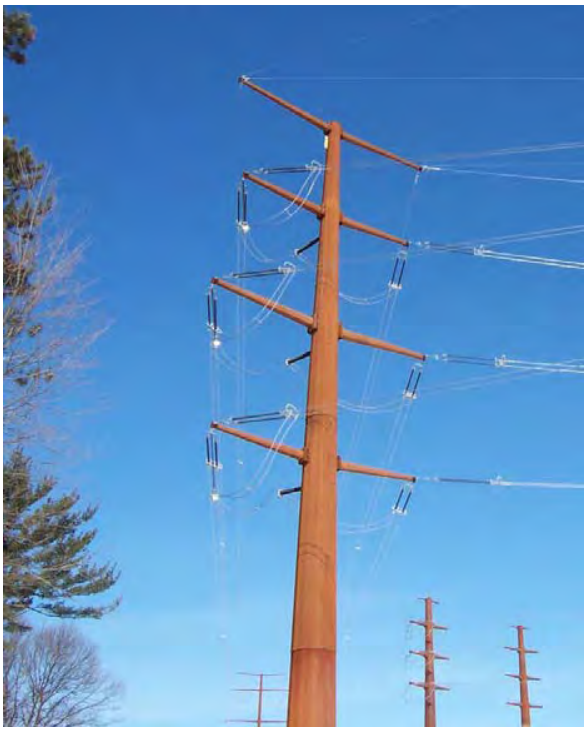
Landscapes would be permanently impacted visually by the placement of the proposed transmission lines and structures. The proposed 345 kV transmission line would result in substantial changes to existing landscapes from the addition of new single steel poles into the existing natural landscape as seen from sensitive viewpoints.

The addition of new transmission lines and their ROW would introduce new elements of line, form, color, and texture into the existing landscape. New transmission structures would introduce straight, vertical lines and color contrasts under certain lighting conditions. Color and textural contrasts would also result from areas disturbed by vegetation removal surrounded by the natural landscape.

The proposed structures would primarily include single-pole, double circuit capable, self-weathering or galvanized steel structures that would range in height between 130 and 175 feet. The span length between structures would typically range in length between 600 and 1,000 feet depending on site-specific considerations. Permanent impacts to agricultural lands include 55 square feet for each pole. The ROW for the proposed 345 kV electrical transmission line would generally be 150 feet in width.

The proposed Project would use primarily single pole, self-weathering or galvanized steel double circuit capable structures (Diagram 5-1). Self-weathering steel oxidizes or rusts to form a dark reddish brown surface coating to protect the structure from further weathering. Single steel pole structures are typically placed on a concrete foundation. There may be site-specific conditions where specialty or multiple pole structures would be required. Conductors are metal cables supported by structures. These cables are typically less than one inch in diameter.

Diagram 5-1. Representative 345 kV Double Circuit Single Pole Structure (Self-Weathering)



In general, structures would have drilled pier concrete foundations (Diagram 5-2). Drilled pier foundations may vary from six to nine feet in diameter and 25 or more feet deep, depending on soil conditions.

Diagram 5-2. Pier Foundation

Where the proposed route is to be located along existing roadways, the structures and transmission lines would visually impact the route experienced by the motorist. In flat or rolling terrain, common in the Project area traversed by the routes, structures can be visible at distances greater than a mile. In the context of agricultural lands the pole structures would be visible from distances of up to two miles. The average height of 130-175 feet makes the new facility visible in the local communities and generally in the landscape. Transmission lines are likely to be seen only at distances up to three quarters of a mile at the most. The vegetation clearing necessary for construction and operation may create a dramatic change in the ROW cover in some areas. The greatest visual impact would be in the interstate viewshed and agricultural landscape.

Aesthetic impacts can vary based on an individual's perspective, values or personal response to their setting. A viewer's response is the psychological reaction of a person to visible changes in the viewshed. The response is based on the sensitivity and exposure of the viewer to that viewshed. An individual's sensitivity is relative to their interest in a viewshed. The individual's exposure is a function of the type of view seen, as well as the distance, perspective, and duration of the view. The term exposure may also refer to the number of people exposed to a particular view.[1]

Viewer characteristics and sensitivity are described in three sensitivity levels:

- Low Visual Sensitivity: most motorists who would see transmission lines or structures from roads that they traverse

[1] Viewer's Response definition and sensitivity ratings were originally defined in The Big Stone Transmission Line Final Environmental Impact Statement (p.85) by the Minnesota Department of Commerce, December 2006.

- Moderate Visual Sensitivity: Some recreationalists, such as bird watchers, hikers, and recreationalists, whose activity is specific to a finite geographic location, who are sensitive to a finite geographic location, and who are sensitive to human-made structures and their impact on the view of the natural environment
- High Visual Sensitivity: Residential viewers who own property within 500 feet of the proposed routes and are concerned about transmission structures and how they impact the view of the natural environment

Applicant Preferred Route

The Applicant Preferred Route parallels County Highway 75 and an abandoned railroad corridor for a short distance. The Applicant Preferred Route then parallels the I-94 ROW until terminating at the Quarry Substation Site 1.

The Mississippi River is in close proximity to some portions of the Applicant Preferred Route, primarily northwest of Monticello. Segments of the Mississippi River are designated either "scenic" or "recreational" through the Minnesota Wild and Scenic Rivers Program (see Section 5.6). Most of the Mississippi River is more than one mile from the Applicant Preferred Route. Approximately one mile of the Applicant Preferred Route, northwest of Monticello, parallels the Mississippi River segment where it is designated as a Recreational River District. The river is also a designated Canoe and Boating Route from St. Cloud through the Project area. However, the ultimate location of the proposed 345 kV transmission line is intended to be outside the designated Recreation corridor.

Sensitive viewing areas and viewpoints are critical viewpoints from which a Project facility would be seen by members of the public who have a concern for scenic resources. Potential sensitive viewpoints along the Applicant Preferred Route occur primarily in communities with views of the route, from I-94, from county roads and state highways in Wright County, and from county parks and other recreational use areas.

The portion of the Applicant Preferred Route near the city of Monticello is within an industrial/commercial area, and would not be visible from any residences within the municipal boundaries. Several residential subdivisions are located near the municipal boundaries of Monticello, Clearwater, and Waite Park. Additionally, there are dispersed rural residential use areas that occur throughout the Applicant Preferred Route.

There are four Wright County parks that are located within one mile of the Applicant Preferred Route that may provide views of the transmission line. These include: 1) Clearwater Wayside County Park, located in the town of Clearwater next to the west side of County Highway 75, one mile north of I-94; 2) Marcus Zumbrunnen County Park, located one half mile south of I-94, next to the west side of County Road 8; 3) Harry Larson Regional Park, located one mile south of I-94, next to the east side of County Road 111; and 4) Montissippi Regional Park, located in the city of Monticello, one half mile north of I-94 and two miles west of Monticello (Wright County, 2008).

In addition, the Applicant Preferred Route along I-94 is within the viewshed of the Eagle Trace Golfers Club, which is located in Clearwater one quarter mile north of the interstate.

The proposed 345 kV transmission line would result in substantial changes to existing landscapes from the addition of new single steel poles into the existing natural landscape as seen from sensitive viewpoints.

Tree removal within the ROW would result in the most noticeable visual impact. Potential effects in forested areas that would result from tree removal would be the contrast of a linear edge of a cleared route through stands of trees. Other vegetation would be permanently removed at structure locations and areas of new permanent access.

The proposed 345 kV transmission line would be within the foreground distance zone (the viewshed for a distance up to 0.5 miles from the viewpoint) of sensitive viewpoints on roadways, and at residences and recreation areas located along the proposed routes. The transmission line would also be visible from some sensitive viewpoints in the middleground distance zone (0.5 to 4 miles), but would also be screened from view at many locations because of intervening trees and man-made structures.

Most of the proposed transmission line would be within the immediate foreground views of travelers on I-94 and numerous Wright County roads that connect rural areas in the county with the interstate. The 345 kV poles and conductors would be obvious in the foreground distance zones to motorists on the roadways, and would add an industrial component to the predominantly rural landscape.

In Wright County, the Clearwater Wayside County Park is located less than 0.25 mile east of the Applicant Preferred Route. Dense stands of tree would screen most views of the transmission line from the park. Intervening tree stands in the Harry Larson Regional Park would also block views of the transmission line. The transmission line would be within the foreground distance zone of the Montissippi Regional Park. Portions of the line may be visible from some areas of the park, and tree cover does not consistently screen views to the south of the I-94 corridor.

Existing land uses crossed by the Applicant Preferred Route predominantly include undeveloped agricultural land, however low density or single-family residential uses also occur. Commercial and industrial uses occur at various locations along the I-94 corridor. The local area is zoned as general agricultural, agricultural/residential, and suburban/residential.

The Applicant Preferred Route would likely affect visual quality and aesthetics within close proximity of the transmission line. The proposed transmission line parallels the Mississippi River and a scenic byway for a portion of the route and is located within a Recreational River District as defined by the Minnesota Wild and Scenic Program (see Section 5.10). Recreational resources are also located nearby. These areas would be considered moderate visual sensitivity resources. There are 62 residences within 500 feet of the Applicant Preferred Route maximum interstate ROW occupancy alignment but fewer residences than along Routes A or B. The 62 residences would be considered high visual sensitivity resources.

Visual impacts generated by proposed electric transmission line installation and operation would be experienced by travelers on I-94, state highways, county roads, and local roads, users of parks and other recreation facilities located near the proposed transmission line route, and within the direct line of sight of residents in municipalities, residential subdivisions, and rural residences.

Because most of the proposed transmission line would be located next to transportation routes, travelers on roadways would experience most of the visual impact from the Project.

Although specific alignments have not yet been determined, I-94 ROW occupancy alignments proposed within the Applicant Preferred Route are discussed in Section 1.5 which reflects the co-location of the transmission line with the transportation route.

A portion of the Interconnect Route would travel along I-94 and would occupy existing transportation ROW in a manner similar to the alignments proposed for the Applicant Preferred Route. The maximum interstate ROW occupancy alignment centerline would be 5 feet from the transportation ROW. The minimum interstate ROW occupancy alignment centerline would be 25 feet from the interstate ROW. A third option, the no interstate ROW occupancy alignment would be 75 feet from the existing interstate ROW.

The distance of the proposed transmission line to the ROW could negatively impact the motorist's experience of interstate corridor but these are low sensitivity receivers and during scoping public comments reflected a preference for ROW occupancy opportunities along the interstate corridor.

Route A

Route A, like the Applicant Preferred Route, crosses Wright and Stearns Counties affecting the cities of Monticello, Clearwater, and St. Cloud as well as surrounding townships. Route A then intermittently parallels I-94, various non-interstate roadways, property lines, and some areas where no existing linear features occur until terminating at the Quarry Substation Site 1.

Areas that are zoned for agriculture make up the majority of land affected by the route with an even higher percentage than the Applicant Preferred Route. In addition, two percent of land within Route A is zoned for special protection agriculture. Although Route A affects more properties zoned residential and recreational in proximity to the previously listed cities, the total areas zoned residential and recreational within the route (two percent and three percent, respectively) are less than for the Applicant Preferred Route (six percent and four percent, respectively). Property lines are utilized more in these areas, as are recreational areas and parks, much of which are also zoned residential.

Aesthetic resources and potential impacts associated with Route A are similar to those described above for the Applicant Preferred Route. Because Route A would cross more residential area, there would be an increased potential for visual impacts to high visual sensitivity areas.

Although the line would be a contrast to some surrounding land uses, Route A maximizes the use of existing routes and avoids residences to the greatest extent practicable.

Route A would likely affect visual quality and aesthetics within close proximity of the transmission line. The route parallels the Mississippi River and a scenic byway for a portion of the route. The proposed 150 ROW is located within a the Recreational River District as defined by the Minnesota Wild and Scenic Rivers Program (see Section 5.10) for less than one mile north of Monticello. Recreational resources are also located nearby. There are 84 residences within 500 feet of Route A maximum interstate ROW occupancy alignment. These residences would be considered high visual sensitivity resources.

Although specific alignments have not yet been determined, I-94 ROW occupancy alignments proposed within Route A are discussed in Section 1.5, which reflects the co-location of the transmission line with the transportation corridor.

A portion of the Interconnect Route would travel along I-94 and would occupy existing transportation ROW in a manner similar to the alignments proposed for the Applicant Preferred Route. The maximum interstate ROW occupancy alignment centerline would be 5 feet from the transportation ROW. The minimum interstate ROW occupancy alignment centerline would be 25 feet from the interstate ROW. A third option, the no interstate ROW occupancy alignment would be 75 feet from the existing interstate ROW.

The distance of the proposed transmission line to the ROW could negatively impact the motorist's experience of interstate corridor but these are low sensitivity receivers and during scoping public comments reflected a preference for ROW occupancy opportunities along the interstate corridor.

Route B

Aesthetic resources and potential impacts associated with Route B are similar to those described above for the Applicant Preferred Route. After exiting the Monticello Substation on land owned by Northern States Power Company, Route B parallels an abandoned railroad corridor for a short distance. Route B then crosses I-94 and parallels various non-interstate roadways, property lines, and some areas where no existing linear features occur until terminating at the Quarry Substation Site 1.

Because Route B would cross more residential area, greater visual impacts would occur than with the Applicant Preferred Route or Route A. In some areas, windrows of trees follow property lines where the Route B ROW would be located. These trees would need to be removed, resulting in further visual impacts.

Although the line would be a contrast to some surrounding land uses, Route B follows existing routes and avoids residences to the greatest extent practicable while avoiding the I-94 corridor.

Route B would likely affect visual quality and aesthetics within close proximity of the transmission line. The route parallels the Mississippi River and a scenic byway for a portion of the route. Less than one acre of the proposed 150 ROW located within a portion of the Recreation River district as defined by the Minnesota Wild and Scenic Rivers Program... Recreational resources are also located nearby. There are 120 residences within 500 feet of the assumed ROW centerline for Route B. These residences are high visual sensitivity resources.

Route C

Aesthetic resources and potential impacts associated with Route C are the same as Route B except at the eastern end of the route in Silver Creek Township where the route diverges to the south. Route C parallels existing roadway ROW where it deviates from Route B but includes an even higher density of residential population along those existing roadways. An additional 27 residences would be within 500 feet of the assumed Route C ROW centerline. These residences are high visual sensitivity resources. Therefore, the viewshed of a greater number of residential properties would be impacted along Route C as compared to Route B. The route travels across

the southern border of the Harry Larson Memorial Wright County Forest on 127th Street NE in Silver Creek Township. Permanent impacts of approximately 12 acres or five percent of the county forest would occur due to vegetation removal.

In Wright County a portion of the Hoglund WMA is within the route on the south side of 140th St. SW and partially within the route as it parallels the WMA traveling south on Ferman Avenue NW. Impacts could be minimized by locating the Project on the opposite side of both roads.

Route D

Route D travels north from the Monticello Substation and parallels the Mississippi River. Route D parallels segments of the Mississippi River designated either "scenic" or "recreational" through the Minnesota Wild and Scenic Rivers Program (see Section 5.10). South of St. Cloud the route crosses the Mississippi River to travel west and parallels I-94 along the same route as the Applicant Preferred Route. The river is also a designated Canoe and Boating Route from St. Cloud through the Project area. A portion of the route parallels and crosses a scenic byway.

The route parallels an existing power line and traverses primarily agricultural zoned land uses. Route D would likely affect visual quality and aesthetics within close proximity of the transmission line; the route crosses the Mississippi River at two locations where existing transmission lines occur. Near its southern end Route D crosses the Mississippi River at a location where an oxbow and small islands exist within the main channel and is designated as a Recreational River District. Further north, portions of the route travel through the portion of the river designated as a Scenic River District and cross the river a second time through the district southeast of St. Cloud. The river provides a recreational resource to water enthusiasts who have moderate visual sensitivity.

There are 59 residences within 500 feet of the Route D assumed transmission line ROW centerline. A subdivision in Clear Lake is subdivided by the route. As noted previously, residences are high visual sensitivity resources. In some areas, windrows of trees follow property lines where Route D would be located. These trees would need to be removed, resulting in further visual impacts.

The distance of the proposed transmission line to the I-94 ROW could negatively impact the motorist's experience of interstate corridor but these are low sensitivity receivers and during scoping public comments reflected a preference for ROW occupancy opportunities along the interstate corridor.

Quarry Substation Site 1

The Proposed Quarry Substation Site 1 is located near the intersection of County Road 23 and I-94. The Quarry Substation Site 1 consists mostly of lands zoned or classified as agricultural use. Applicants are seeking up to 40 acres for the proposed Quarry Substation. The surrounding land use for both Proposed Quarry Substation Sites 1 and 2 are generally agricultural and industrial. Since industrial and commercial properties exist in this an area, a substation would not be out of place. The Quarry Substation Site 1 is located approximately 1,000 feet west of an existing residential use area. However, an existing tree line occurs between the residential use area and the southern siting area.

Quarry Substation Site 2

Both Proposed Quarry Substation Sites 1 and 2 are located along State Highway 23. The Proposed Quarry Substation Site 2 consists of lands zoned or classified for agricultural and industrial use. Since industrial and commercial properties exist in this an area, a substation would not be out of place.

Quarry Substation Site 3 and 115 kV Interconnect

Quarry Substation Site 3 is located on the north side of I-94 southwest of the city of St. Cloud. The surrounding area consists mostly of lands zoned or classified as agricultural use. Quarry Substation Site 3 is directly adjacent to I-94 and views to the site are open. Motorists traveling on the I-94 corridor would be considered having low visual sensitivity.

This site is considerably smaller than the areas for Proposed Quarry Substations 1 and 2 located further north. Construction of the proposed substation may be restricted by the size of the area. The proposed 115 kV transmission lines and the 115 kV Interconnect would connect Quarry Substation 3 to the existing 115 kV transmission line directly to the north. Visual impacts associated with this transmission line would be reduced if this site is selected because the alternative substation sites would require the 345 kV transmission line, which is a larger facility, to run through the same area. The structures and transmission lines would less visible from surrounding land uses.

A portion of the Interconnect Route would travel along I-94 and would occupy existing transportation ROW in a manner similar to the alignments proposed for the Applicant Preferred Route. The maximum interstate ROW occupancy alignment centerline would be 5 feet from the transportation ROW. The minimum interstate ROW occupancy alignment centerline would be 25 feet from the interstate ROW. A third option, the no interstate ROW occupancy alignment would be 75 feet from the existing interstate ROW.

The distance of the proposed transmission line to the ROW could negatively impact the motorist's experience of interstate corridor but these are low sensitivity receivers and during scoping public comments reflected a preference for shared occupancy opportunities along the interstate corridor.

Great River Road Potential Impacts

This section discusses the potential impacts to the Great River Road from the route and substation alternatives. Impacts generally include the conversion of existing undisturbed land uses to transmission line ROW, and intrusion upon the existing viewshed.

Applicant Preferred Route

The Applicant Preferred Route follows Wright County Highway 75 for almost six miles. Motorists on the Great River Road would have foreground views of the Applicant Preferred Route where the proposed 345 kV transmission line would parallel the road. Impacts from the construction of a transmission line along this segment of the Great River Road would include:

- Substantial changes to existing landscapes from the addition of new single steel poles into the existing natural landscape

- Intrusion into the foreground distance zone (the viewshed for a distance up to 0.5 miles from the viewpoint) of sensitive viewpoints on roadways and recreation areas located along the proposed routes
- Intrusion into the middleground distance zone (the viewshed from 0.5 to 4 miles) for some sensitive viewpoints but would also be screened from view at many locations because of intervening trees and man-made structures.

Because most of the proposed transmission line would be located next to transportation routes, travelers on roadways would experience most of the visual impact from the Project.

A secondary effect of transmission line construction and operation could be a reduction in the ability of this portion of the Great River Road to qualify for the National Scenic Byway Discretionary Grants program. The presence of the transmission line could have a negative effect on the intrinsic qualities of the scenic byway, most likely to the natural and scenic qualities.

Route A

Route A follows Wright County Highway 75 for approximately four miles. Impacts from construction of a transmission line along this segment of the Great River Road would be essentially the same as those identified for the Applicant Preferred Route.

Routes B and C

Routes B and C do not follow the Great River Road, although they do cross Wright County 75 near the existing Monticello Substation. In general, Routes B and C are located to the west and south of Wright County Highway 75, Stearns County Highway 75, and I-94. Significant impacts to the Great River Road are not anticipated; options for crossing Wright County Highway 75 could be considered to limit impacts in that area.

Route D

Route D crosses the Mississippi River from the west bank to the east bank near the Monticello substation and follows an existing 115 kV transmission line to a point east of St. Cloud, where it crosses back to the west bank of the Mississippi. This route crosses the Great River Road at the Stearns County Highway 74/I-94 interchange. Limited impacts to the Great River Road are anticipated. A transmission line following this route would be visible from the Great River Road in various locations, but this effect would be tempered by the fact that an existing 115 kV transmission line is already present within the same route. Since the crossing of the Great River Road occurs at an interchange, the natural and scenic qualities of the roadway have already been altered by infrastructure development.

Quarry Substation Sites 1, 2 and 3, and the 115 kV Interconnect

All proposed substation sites and the proposed 115 kV interconnect associated with Substation Site 3 are located west of the Great River Road, and are not anticipated to have an impact on any of the intrinsic qualities of this scenic byway.

5.6.3 Mitigation

Based on a viewer's response and sensitivity, the presence of transmission lines can detract from the visual attractions of an area. Landowners would be consulted to identify concerns. Wherever possible, the proposed transmission lines would be routed alongside existing power lines and section lines, as well as within road, rail, and utility ROWs, to minimize any adverse impacts.

The transmission line would contrast surrounding land uses, therefore landowners would be consulted to identify any concerns related to the Project and visual aesthetics.

Generally, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Mitigation measures would not vary between alternative routes. Potential Mitigation measures could include:

- The placement of structures would allow the maximum feasible distance between residences within the limits of the structure design.
- Final structure locations, ROW, and any disturbed areas would be determined by considering input from landowners or land management agencies to minimize visual impacts.
- Consideration would be made to preserve the natural landscape; construction and operation would be conducted to prevent unnecessary destruction, scarring, or defacing of the adjacent natural setting in the vicinity of the Project.
- The installation of vegetative tree buffers to limit visual impacts from surrounding areas could be implemented.
- River crossing would occur in the same location as existing transmission lines.
- Undergrounding versus aerial river crossings could be considered.
- To the extent possible, transmission lines would parallel existing transmission lines and existing ROWs without violating sound engineering principles or system reliability criteria.
- Structures would be located at the maximum feasible distance from highway and trail crossings within the limits of the structure design.
- Along existing roadways, transmission line alignments could be placed at locations with the fewest impacts to existing ROW.
- Visual screening with vegetation could be considered in the foreground where the route parallels scenic byways but due to the height of the structure and the transmission lines may still be visible in the background.

Great River Road Mitigation

Generally, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Mitigation measures would not vary greatly between alternative routes. Potential mitigation measures could include:

- Final structure locations, ROW, and any disturbed areas could be determined by considering input from the MN-MRPC to minimize visual impacts.
- Consideration could be made to preserve the natural landscape; construction and operation could be conducted to prevent unnecessary destruction, scarring, or defacing of the adjacent natural setting in the vicinity of the Project.
- Where possible, the alignment could be required to be on the west/south side of County Highway 75 to avoid intrusion on the view from the road toward the river.
- River crossings could occur in the same location as existing transmission lines.
- Undergrounding versus aerial river crossings could be considered.
- To the extent possible, transmission lines could parallel existing transmission lines and existing ROWs, or be collocated with existing structures in a multiple circuit configuration.
- Visual screening with vegetation could be considered in the foreground where the route parallels scenic byways but due to the height of the structure and the transmission lines may still be visible in the background.
- Visually softening the impact of the transmission lines by planting lower growing trees and other vegetation in the ROW.

Should a route be permitted that would impact the Great River Road, discussions could be conducted with the MN-MRPC on final alignment and construction method constraints.

5.7 PARKS (CITY, COUNTY, STATE, AND FEDERAL)

Parks are community resources that provide recreational opportunities such as snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting, and nature observation. No federal parks are located in the Project area. This section discusses potential impacts on state, county and city parks located in the area of the project.

5.7.1 Affected Environment

The Project study area contains a variety of scenic settings, primarily within open space, parks, and some recreational use areas such as golf courses. These areas are located within the municipal boundaries of communities along the proposed routes, and in unincorporated Wright and Stearns counties. Several county parks located in close proximity to I-94 offer a variety of outdoor recreational opportunities in scenic settings. Refer to Appendix G for a map of resources including parks.

5.7.2 Potential Impacts

There are no impacts anticipated as a result of the construction of Quarry Substation Sites 1, 2 or 3. Impacts as a result of the construction of the transmission line for each of the routes are discussed below.

Applicant Preferred Route

Several parks are located near the Applicant Preferred Route. Segments of the Mississippi River are designated either "scenic" or "recreational" through the Minnesota Wild and Scenic Rivers Program (see Section 5.10). The Applicant Preferred Route parallels I-94 and County Highway 75 to the west of the Mississippi River segment where it is designated as a recreational corridor. However, the ultimate location of the proposed 345 kV transmission line is intended to be outside the designated Recreation corridor.

Parks and other recreational areas in proximity to or traversed by the Applicant Preferred Route are described below from east to west.

There are no parks in or along the Applicant Preferred Route in Monticello; however, several parks are located in proximity to the Project's eastern terminus. The City/Xcel ball fields are located just east of the Project terminus on West River Street, adjacent to I-94. The 14-acre softball complex includes four lighted ball fields with support facilities.

Montissippi Park is a Wright County park located less than one mile southeast of the Applicant Preferred Route's origin. The park is east of the Xcel energy nuclear generating facility, adjacent to the Mississippi River. The 170-acre park offers a variety of recreational opportunities.

Marcus Zumbrunnen County Park is located on County Road 8 approximately one-half of a mile south of I-94. This Wright County Park includes a hiking trail and picnic site.

Warner Lake County Park is located west of Clearwater in Stearns County. The park is adjacent to the west side of the I-94 roadway corridor. A portion of the park is located within the Applicant Preferred Route. The park features all-season recreational opportunities and includes a campground shelter, picnic shelter, trails and a swimming beach. Amenities located

within the Applicant Preferred Route include an access drive, parking lot, boat launch and walking trails. During the winter the access drive and walking trails are used for snowmobiling. The park and its snowmobile trail are located along the parks border with the I-94 Mn/DOT ROW. If the maximum ROW occupancy alignment is selected a corner, amounting to approximately one acre, of the park will be impacted by the presence of the proposed transmission line. However, there are no trees present at that corner therefore vegetation impacts will not occur.

Although specific alignments have not yet been determined, I-94 corridor occupancy options within the Applicant Preferred Route have been proposed that consider ROW occupancy with the transportation corridor. The maximum interstate ROW occupancy alignment proposes an alignment within the 5 feet of ROW and minimizes impacts to this park by only impacting a one acre portion on a corner of the parks boundary The minimum interstate ROW occupancy alignment proposes an alignment within 25 feet of the interstate ROW. A third option, the no interstate ROW occupancy alignment, proposes no occupancy with the existing interstate ROW. The impacts to land uses within these three possible scenarios are also qualitatively discussed.

In Wright County, the **Clearwater Wayside County Park** is located less than 0.25 mile east of the Applicant Preferred Route.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. Refer to Table 5-18 for impacts on recreational/open space/ parks associated with the Applicant Preferred Route for each ROW occupancy scenario.

Table 5-18. Recreational/Open Space/Parks Impacts - Applicant Preferred Route

Applicant Preferred Route	ROW Recreational/Open Space/Parks (acres)	ROW Percent Recreational/Open Space/Parks
Maximum Interstate ROW occupancy	19	3.7
Minimum Interstate ROW occupancy	19	3.7
No Interstate ROW occupancy	18	3.4

Route A

Several parks are located near Route A. Parks and potential impacts associated with Route A are similar to those described above for the Applicant Preferred Route.

In Clearwater there is one additional city-owned park in proximity to Route A. Cedar South Park is a new, 16-acre park located west of County Road 7 in the Cedar South subdivision. The neighborhood park has playground equipment and open space with additional park development planned.

Located to the southwest of St. Cloud is a Stearns County Park; Quarry Park. Route A travels within one mile of this park which is integrated with the Quarry Park SNA. Together the park

and the natural area are over 600 acres in size and offer all-season outdoor recreation opportunities. See Section 5.9 for a discussion on SNAs.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within Route A reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. Refer to Table 5-19 for impacts on recreational/open space/parks associated with Route A for each ROW occupancy scenario.

Table 5-19. Recreational/Open Space/Parks Impacts – Route A

Route A	Recreational/Open Space/Parks (acres)	ROW Percent Recreational/Open Space/Parks
Maximum Interstate ROW occupancy	12	2.0
Minimum Interstate ROW occupancy	13	2.2
No Interstate ROW occupancy	16	2.7

Route B

Several parks are located near Route B. Recreational resources and potential impacts associated with Route B are similar to those described above for the Applicant Preferred Route but also travels within one mile of Quarry Park similar to Route A.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, two acres of recreational/open space/parks would be impacted which represents less than one percent of the ROW.

Route C

Since Route C follows the same route as Route B except through Silver Creek Township the resources and impacts are similar to those described above for the Applicant Preferred Route.

The portion of the route that deviates from Route B and travels further south is closer to Lake Maria State Park. The park's northern border is approximately one half mile away from the route.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, two acres of recreational/open space/parks would be impacted which represents less than one percent of the ROW.

Route D

There are no parks along Route D, but there are some parks near the route. Like the other alternatives Route D is located within one mile from Wright County's Montissippi Park resources and impacts to the park are the same as for the Applicant Preferred Route.

In the City of Becker, Kolbinger Park is located north of Highway 10 approximately three-quarters of a mile from the route.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, no impacts on recreational/open space/parks would occur.

5.7.3 Mitigation

No impacts on parks are anticipated, and therefore, no mitigative measures are proposed.

5.8 TRAILS

Trails are built linear networks that travel throughout the state. Minnesota's trail systems provide year-round recreational opportunities for snowmobiling, biking, and hiking. Trails are located throughout the project area specifically in Stearns and Wright Counties. This section discusses potential impacts on trails in the area of the project. No permanent impacts on trails are anticipated as a result of the construction of Route D or the three Quarry Substation Sites. The individual routes and substations are discussed in further detail below.

5.8.1 Affected Environment

A system of trails parallels I-94 through most of the Project study area. A County trail travels parallels I-94 through two counties; south of Clearwater it is a Wright County Trail and north of Clearwater it is a Stearns County Trial. The Mississippi River Trail is also planned through the area, although the specific route has not been finalized. County trails for snowmobiling and multi-use non-motorized vehicles are located in Wright, Stearns, and Sherburne Counties. Refer to Appendix G for a map of trails within the project area.

5.8.2 Potential Impacts

Applicant Preferred Route

A Wright County Trail is located within the Applicant Preferred Route running parallel to I-94 along County Highway 75 from Monticello north for approximately nine miles. The trail is located along existing roadways. North of Clearwater, the Project would cross the Stearns County trail two times at locations where the trail travels perpendicular to the route along existing roadways.

The Wright County Trail portion intersects another regional trail that connects to the Marcus Zumbrunnen County Park at the southwest intersection of I-94 and County Road 8. This trail would be crossed by the Applicant Preferred Route.

Warner Lake County Park is located west of Clearwater along the Applicant Preferred Route. A portion of the park that includes seasonal trials for hiking and snowmobiling is located within the route.

Impacts to the Wright County trails could include temporary construction impacts to trails crossed by or along a route. Visual impacts to the trails would occur from the proximity to the transmission line and structures.

Due to width constraints between the Warner Lake County Park and the I-94 ROW, permanent impacts to these trails could occur if the transmission line were constructed on the west side of I-94.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. If the proposed transmission lines are co-located along the I-94 corridor where it is adjacent to a trail temporary construction impacts to the trail could occur. Refer to Table 5-20 for impacts on county trails associated with the Applicant Preferred Route for each ROW occupancy scenario.

Table 5-20. County Trail Impacts – Applicant Preferred Route

Applicant Preferred Route	Number of County Trails within ROW
Maximum Interstate ROW occupancy	1
Minimum Interstate ROW occupancy	1
No Interstate ROW occupancy	0

Route A

Approximately six miles of the Wright County Trail are located within Route A where it parallels I-94 north of Monticello. The trail is located along existing roadway ROW. North of Clearwater, where the trail becomes a Stearns County Trail the Project would cross the trail two times where it travels perpendicular to the route along existing roadways.

The Wright County Trail portion intersects another regional trail that connects to the Marcus Zumbrunnen County Park at the southwest intersection of I-94 and County Road 8. This trail would be crossed by Alternate Route A.

Similar to the Applicant Preferred Route, a portion of the Warner Lake County Park that includes seasonal trials for hiking and snowmobiling is located within Alternate Route A.

Impacts to the Wright County trails could include temporary construction impacts to trails crossed by or along a route. Visual impacts to the trails would occur from the proximity to the transmission line and structures.

Due to width constraints between the Warner Lake County Park and the I-94 ROW, permanent impacts to these trails could occur if the transmission line were constructed on the west side of I-94.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. If the proposed transmission lines are co-located along the I-94 corridor where it is adjacent to a trail temporary construction impacts to the trail could occur. Refer to Table 5-21 for impacts on county trails associated with Route A with for ROW occupancy scenario.

Table 5-21. County Trail Impacts – Route A

Route A	Number of County Trails within ROW
Maximum Interstate ROW occupancy	1
Minimum Interstate ROW occupancy	1
No Interstate ROW occupancy	1

Route B

Less than a mile of the Wright County Trail, which parallels I-94 north of Monticello, is located within Route B.

The regional trail that connects to the Marcus Zumbrunnen County Park continues south on County Road 8 to Lake Maria State Park. Route B would travel along this trail and County Road 8 for less than one-half of a mile and cross the trail at one location near 140th Street NW.

Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, a portion of the Wright County trail would be permanently impacted by the ROW where it parallels the trail. Temporary construction impacts to the trails could occur where the transmission line spans or travels along the trail. Visual impacts to the trails would occur from the proximity to the transmission line and structures.

Route C

Route C is similar to Route B where it includes a short section of the Wright County Trail in its route. Resources and impacts associated with Route C are similar to Route B. Route C would also travel along the regional trail that connects the Marcus Zumbrunnen County Park and Lake Maria State Park. The route would cross this trail at one location near 128th Street NW.

Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, a portion of the Wright County trail would be permanently impacted by the ROW where it parallels trail. Temporary construction impacts to the trails could occur where the transmission line spans or travels along the trail. Visual impacts to the trails would occur from the proximity to the transmission line and structures.

Route D

Route D is within the Sherburne County proposed trail corridor, a two-mile wide area from the Mississippi River eastward, but does not impact any trails directly. A snowmobile and multi-use Non-Motorized Sherburne County Trail is located within one mile from Route D near the City of Becker. The Mississippi River Trail is also planned through the area, although the specific route has not been finalized.

The MnDNR Division of Trails and Waterways owns two parcels within one mile from Route D but does not delineate any trails alignments within the parcels.

A small portion of a Stearns County Trail that parallels County Highway 75 in St. Augusta is included in Route D where the route changes direction to re-enter the I-94 corridor. No impacts to the trail will occur because the 150 ft ROW does not include any portion of this trail

Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, no impacts on county trails would occur.

5.8.3 Mitigation

There are no impacts anticipated for Route D or the 3 substation sites. The mitigation for the Applicant Preferred Route, Route A, Route B and Route C are discussed below.

Applicant Preferred Route and Route A Mitigation

Locating the transmission lines east of I-94 would avoid any impacts to Warner Lake County Park and its trails. The portion of the route that includes a section of Warner Lake County Park is at a location where the route is wider than 1000 feet so impacts to the trails can be avoided. If the Project was located west of I-94 near Warner Lake County Park and there was no ROW collocation with Mn/DOT, the Applicant would work with the County to maintain park access to trails and park amenities. The maximum ROW occupancy would have the smallest impact on the park (one acre) if the proposed transmission line alignment were located on the west side of the interstate.

The Applicant will work with the County to maintain trail access during and after construction. If impacts to trails are avoidable, the Applicant will work with the County to re-align trails.

The Project would span trails that are crossed by the transmission line. Impacts to trails could include temporary construction impacts to trails crossed by or along a route. Visual impacts could occur for users within one-half mile of the line where the foreground is not vegetated by mature trees.

Route B and Route C

Permanent impacts to the Wright County trail that is paralleled by the proposed transmission line ROW for Route B and Route C can be mitigated if the portions of the trail that run parallel to the ROW are spanned. If impacts to trails are avoidable, the Applicant will work with the County to re-align trails to the opposite side of the existing roadway where they are parallel to the transmission line ROW. The Applicant will work with the County to maintain trail access during and after construction.

Route D

No permanent impacts on trails are anticipated and therefore, no mitigative measures are proposed.

5.9 STATE WILDLIFE MANAGEMENT AREAS/SCIENTIFIC NATURAL AREAS

WMAs and SNAs are Minnesota State managed resources. WMAs protect wildlife habitat in the state for hunting, trapping, fishing and recreational use. SNAs focus on the preservation of ecological diversity and provide educational and scientific research opportunities. The MnDNR designated Minnesota County Biological Survey (MCBS) identifies unmanaged areas of significant biodiversity which identify significant and rare native habitats and communities. This section discusses potential impacts to managed and unmanaged state resources in the area of the project. There are no anticipated impacts on WMAs and SNAs as a result of constructing either of the three Quarry Substations. However, the eastern segment of the 115 kV interconnect that would be necessary for Quarry Substation 3 Site travels within one-half mile of the Quarry Park SNA.

5.9.1 Affected Environment

Throughout the Project area, there are several areas where high-quality wildlife habitat occurs naturally or is being managed. WMAs are part of the Minnesota state recreation system created to protect wildlife habitat and provided wildlife based recreation. WMAs are managed for wildlife production and are open to public hunting and wildlife watching. SNAs are part of a program that preserves natural features and rare resources of exceptional scientific and educational value. Unmanaged areas include the MnDNR designated MCBS. The MCBS identifies biodiversity significance and rare native habitats and communities. According to the MnDNR the survey, "systematically collects, interprets, and delivers baseline data on the distribution and ecology of rare plants, rare animals, native plant communities, and functional landscapes needed to guide decision making." A detailed discussion of MCBS Significant Sites can be found in Section 5.15. Refer to Appendix G for a map of natural resources, including any WMAs or SNAs, in the project area.

5.9.2 Potential Impacts

Applicant Preferred Route

There are no sections of the Applicant Preferred Route which cross WPAs or WMA lands.

There is one SNA within one mile of the Applicant Preferred Route. The Clear Lake SNA is located approximately one-half mile east of the route, across the Mississippi River, in a location where it exceeds the typical 1000-foot-wide route. The 62 acre site is distinct because it was the first parcel acquired under the Wild and Scenic Rivers Program. The Clear Lake SNA includes; oak forest, floodplain forest, and old field sumac thicket, along with a small population of the very rare Hill's thistle. According to the MnDNR, the Hill's thistle is generally found in transition zones between major forest and prairie communities on dry, sandy or gravelly soil.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. Based on this requirement, no MnDNR Wildlife Management Areas would be impacted by the ROW.

Route A

There are no sections of Route A which cross WPAs or WMA lands.

The Hoglund WMA is located within one mile of Alternate Route A. The site is approximately 360 acres and provides opportunities for hunting, trapping, wildlife viewing and hiking. The vegetation includes a mix of hardwood forest, wetlands and restored prairie grasslands.

There are two SNAs within one mile of Alternate Route A. Similar to the Applicant Preferred Route; the Clear Lake SNA is located approximately one-half mile east of the route, across the Mississippi River, in a location where it exceeds the typical 1,000-foot-wide route.

Additionally, at the north end of the route, Quarry Park SNA is located approximately one-half mile east of the route. The site is a 250-acre Sterns County Park and nature preserve that is permanently protected by a conservation easement. Granite bedrock outcrops at Quarry Park SNA and are generally less than 20 inches below the ground surface and intermix with high quality wet meadow, wet prairie, oak woodland, and oak forest. The vegetation community supports rare birds and orchids and forms the most significant remaining example of the granite bedrock outcrop community in central Minnesota. Present in the SNA is the state's largest population of the state-endangered tubercled rein-orchid. The red-shouldered haw is a species listed as a special concern in Minnesota and breeding populations are present in the wooded and forested areas of the site. The woodlands and forest harbor breeding populations of the red-shouldered hawk, listed as a special concern in Minnesota.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. Based on this requirement, no MnDNR Wildlife Management Areas would be impacted by the ROW.

Route B

Route B includes a portion of the Hoglund WMA in Silver Creek Township. Approximately 2.25 acres of the WMA are within the route near the intersection of 140th Street NW and Filmore Avenue NW. Resources associated with Hoglund WMA are described in the Route A discussion.

There is one SNA within one mile of Route B. Quarry Park SNA is located approximately one-half mile east of the route. Refer to the Route A discussion for a description of the resources and impacts associated with Quarry Park SNA.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, one MnDNR Wildlife Management Areas would be impacted by the ROW. Temporary construction and permanent impacts the WMA would occur from vegetation removal for the portion of the Project that would intersect the WMA. However, overall habitat would not be fragmented or diminished as the portion removed would not interrupt the larger continuous parcel as it is on an outer border of the site.

Route C

Like Route B, Route C includes a portion of the Hoglund WMA in Silver Creek Township. Approximately two acres of the WMA are within the route along the west side of Ferman Avenue NW.

This route is similar to Route B where it is located in proximity to Quarry Park SNA. Quarry Park SNA is located approximately one-half mile east of the route. Refer to the Route A discussion for a description of the resources and impacts associated with Quarry Park SNA.

Route C encompasses a parcel of land owned by the Minnesota DNR on the south side of 127th Street NW. This parcel is approximately 12 acres in size and the land is part of the Reinvest in Minnesota (RIM) program which uses money raised from the sale of the critical habitat license plates to purchase and develop important areas for fish and wildlife.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, one MnDNR Wildlife Management Area would be impacted by the ROW.Temporary construction impacts and permanent impacts to the Hoglund WMA would occur from vegetation removal for the portion of the Project that would intersect the Hoglund WMA. However, overall habitat would not be fragmented or diminished as the portion removed would not interrupt the larger continuous parcel as it is on an outer border of the site.

Permanent impacts to the RIM parcel would occur through vegetation removal and dissection if the route traveled on the south side of the roadway.

Route D

There are no sections of Route D which cross WPAs. There is one SNA within one mile of Alternate Route D. Clear Lake SNA is located between Route D and the Mississippi River. The boundary of the SNA is less than 300 feet from the route. Refer to the Applicant Preferred Route discussion for a description of the SNA.

5.9.3 Mitigation

No impacts on WMAs or SNAs are anticipated as a result of the Applicant Preferred Route, Route A, or Route D and therefore, no mitigative measures are proposed. Mitigation for Routes B and C is discussed below.

Route B Mitigation

Acquiring a portion of a WMA would require close coordination with the MnDNR and would likely require mitigation in the form of additional land of equal or greater ecological value. Impacts to the portion of the Hoglund WMA intersected by the route could be avoided if the transmission line were constructed on the north side of 140th Street NW.

Route C Mitigation

Impacts to the portion of the Hoglund WMA intersected by the route could be mitigated if the transmission line were constructed on the east side of Ferman Avenue NW at this location.

Should this route be selected on the west side of the road, the Applicant would work with the MnDNR to avoid and minimize impacts to any sensitive habitats.

Impacts to the Minnesota DNR parcel which is a part of the RIM program could be mitigated if the transmission line were constructed on the south side of 127th Street NW at this location. Should this route be selected on the west side of the road, the Applicant would work with the MnDNR to avoid and minimize impacts to any sensitive habitats.

5.10 SCENIC AND RECREATIONAL WATERWAYS

Scenic and recreational waterways are water resources that provide recreational opportunities such as swimming, boating, canoeing, and hiking. The State of Minnesota designates wild, scenic and recreational rivers through its Wild and Scenic Rivers Program. This section discusses potential impacts to scenic and recreational waterways in the area of the project. The Mississippi River is the dominant natural landform in the vicinity of the Project. Segments of the Mississippi River are designated either "scenic" or "recreational" through the Minnesota Wild and Scenic Rivers Program and are located within the project area.

5.10.1 Affected Environment

The Minnesota Wild and Scenic Rivers Program protects rivers that possess outstanding natural, scenic, geographic, historic, cultural, and recreational values. The program includes three designated districts representing different classifications. According to the Minnesota Department of Natural Resources a 'Wild River' exists, "in a free-flowing state (i.e. without significant artificial modification) with excellent water quality and adjacent lands which are essentially primitive." A 'Scenic River' is also free-flowing but its adjacent land uses are primarily undeveloped and 'Recreational Rivers' have experienced either impoundment or diversion with largely developed lands adjacent to its banks but are still worth protection and preservation.

The Mississippi River between the cities of St. Cloud and Monticello was designated as a state Wild and Scenic River in 1973. The segment between St. Cloud and Clearwater is a designated Scenic river, and the segment between Clearwater and Monticello is a designated Recreational river. Refer to Appendix G for a map of the scenic and recreational districts.

The protected Wild, Scenic, and Recreational Land Use District generally follows the road or property line nearest to an imaginary "line of sight," the approximate distance that a person can see back from the river. High visual impacts occur to scenic waterways would occur where a new transmission line would cross a scenic waterway or be visible from a scenic waterway. Refer to Appendix G for a map of the Wild and Scenic River District.

Minn. Rules 6105.0870 subp.9 requires the Applicant to coordinate with the MnDNR in determining the most appropriate location for energy facilities located within the Scenic and Recreational Land Use District. As of the date of the EIS publication, these rules are under revision and the MnDNR is considering merging these rules with state shoreline management rules.

5.10.2 Potential Impacts

Applicant Preferred Route

Most of the Mississippi River is located more than one mile away from the Applicant Preferred Route. This route parallels the Mississippi River to the west for a slightly longer distance than Alternate Routes A and B, and is also located in closer proximity.

Northwest of Monticello where the river is a designated Recreational River District, approximately 170 acres of district are located within the Applicant Preferred Route's corridor. If an alignment is selected through this district, impacts may occur to existing vegetation and the

viewshed. Further north along the route where the river ox-bows in Clear Lake township, less than four acres of the route is within the Recreational River District.

Portions of the Mississippi River and the Scenic River District (segment between St. Cloud and Clearwater) are located within one-half mile of the Applicant Preferred Route near Clearwater and St. Augusta, however at both locations it is outside of the designated district. Under the Applicant Preferred Route option, no permanent impacts to scenic waterways would occur.

Because the Applicant Preferred Route travels along the existing I-94 corridor where it is located within the district, no additional impacts to vegetation would be expected at this location but visual impacts could occur to the waterway from views of the transmission line.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. Refer to Table 5-22 for impacts on Minnesota State Wild and Scenic River Districts associated with the Applicant Preferred Route for each ROW occupancy scenario.

Table 5-22. Minnesota State Wild and Scenic River Impacts – Applicant Preferred Route

Applicant Preferred Route	ROW Minnesota State Wild and Scenic River Districts (acres)*	ROW Percent Minnesota State Wild and Scenic River Districts
Maximum Interstate ROW occupancy	26	5.1
Minimum Interstate ROW occupancy	26	5.1
No Interstate ROW occupancy	26	4.9

**Minnesota DNR Data Deli, 2009.*

Route A

Route A parallels the Applicant Preferred Route and the Mississippi River. Where Route A diverges from the Applicant Preferred Route it is located further west and at a greater distance to the river than the Applicant Preferred Route.

Northwest of Monticello, approximately 100 acres of the designated Recreational River District is located within the Applicant Preferred Route's corridor.

Similar to the Applicant Preferred Route, portions of the Mississippi River and the Scenic River District (segment between St. Cloud and Clearwater) are located within one-half mile of Route A in Clearwater.

Because Route A travels along the existing I-94 corridor where it is located within the district, no additional impacts to vegetation would be expected at this location but visual impacts could occur to the waterway from views of the transmission line.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within Route A reflect the co-location of the transmission line with the transportation

corridor as described in Section 1.5. Refer to Table 5-23 for impacts on Minnesota State Wild and Scenic River Districts associated with Route A for each ROW occupancy scenario.

Table 5-23. Minnesota State Wild and Scenic River Impacts – Route A

Route A	ROW Minnesota State Wild and Scenic River Districts (acres)*	ROW Percent Minnesota State Wild and Scenic River Districts
Maximum Interstate ROW occupancy	10	1.7%
Minimum Interstate ROW occupancy	10	1.7%
No Interstate ROW occupancy	9	1.5%

**Minnesota DNR Data Deli, 2009.*

Route B

Of all of the alternatives, Route B is located at the greatest distance from the Mississippi River which it parallels to the west. Only a small portion, approximately 30 acres, of the designated Recreational River District is located within Route B's corridor northwest of Monticello. At this location, the route parallels the existing I-94 corridor which has previously disturbed vegetation within the area.

Visual impacts to the district may occur if the transmission line is visible from the river. Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, less than one acre and less than one percent of the Minnesota State Wild and Scenic River Districts would be impacted by the ROW. Temporary construction impacts to the district could occur where the transmission line spans or travels along the scenic waterway. Visual impacts to the scenic waterway could occur from the proximity to the transmission line and structures.

Route C

This route is similar to Route B and parallels the Mississippi River to the west but includes a segment in Silver Creek Township that is located further south than Route B. At its closest proximity, the segment that diverges from Route B is more than a one-half mile from the district's western boundary.

The affected environment and associated impacts to scenic waterways are the same as Route B. Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, less than one-half of an acre, which represents no measurable percentage of the Minnesota State Wild and Scenic River Districts would be impacted by the ROW. Temporary construction impacts to the district could occur where the transmission line spans or travels along the scenic waterway. Visual impacts to the scenic waterway could occur from the proximity to the transmission line and structures.

Route D

Route D parallels the Mississippi River to the north for approximately 18 miles. This route crosses the Mississippi River twice; at one location where it is a designated Scenic River District

and at one location where it a designated Recreational River District. The Mississippi River is located in closer proximity to Route D than any of the other alternatives, less than a tenth of a mile in one location. The river is also a designated Canoe and Boating Route from St. Cloud through the Project area. The Scenic River District (segment between St. Cloud and Clearwater) is crossed by the route southwest of St. Cloud. Recreational River District is crossed by the river northwest of Monticello. At both river crossings there is an existing transmission line alignment.

Northwest of Monticello, approximately 80 acres of the designated Recreational River District are located within Route D's corridor at the location where the route crosses the Mississippi River.

In Clear Lake Township Route D travels through portions of the designated Scenic River District. Approximately 235 acres of the district are within the Route D corridor. Where the route traverses the Scenic River District it is paralleling an existing transmission line therefore no additional visual impacts are anticipated. After crossing the River southwest of St. Cloud in this district the route diverges slightly from the existing transmission line for less than three tenths as it exits the district.

Vegetation and visual impacts associated with the transmission lines are not anticipated because an existing transmission line crossing exists at the crossing located northwest of Monticello.

Land use at the crossing southwest of St. Cloud is primarily cropland but vegetation impacts and temporary construction impacts could occur if trees are removed to accommodate the new transmission line along this alignment.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Based on this requirement, 33 acres, which represent six percent of the Minnesota State Wild and Scenic River Districts, would be impacted by the ROW. Temporary construction impacts to the district could occur where the transmission line spans or travels along the scenic waterway. Visual impacts to the scenic waterway could occur from the proximity to the transmission line and structures.

Quarry Substation Site 1

Quarry Substation Site 1 is located more than five miles from the Mississippi River and its designated Scenic River District. No impacts to scenic waterways are anticipated as a result of the construction of the proposed Quarry Substation Site 1.

Quarry Substation Site 2

Quarry Substation Site 2 is located more than five miles from the Mississippi River and its designated Scenic River District. No impacts to scenic waterways are anticipated as a result of the construction of the proposed Quarry Substation Site 2.

Quarry Substation Site 3 and the 115 kV Interconnect

Quarry Substation Site 3 is located more than five miles from the Mississippi River and its designated Scenic River District. No impacts to scenic waterways are anticipated as a result of the construction of the proposed Quarry Substation Site 3 or the 115 kV interconnect.

5.10.3 Mitigation

No impacts on scenic or recreational waterways are anticipated as a result of any of the substation sites, and therefore, no mitigative measures are proposed.

Mitigation measures for potential impacts to crossing scenic and recreational waterways would be to co-locate the transmission line with an existing transmission line crossing. Mitigation measures for visual impacts to scenic waterways with transmission lines adjacent to the district within the viewshed to recreationalists would be to locate transmission lines and structures at a maximum distance from scenic or recreational waterways. Mitigation measures specific to each route are described below.

Applicant Preferred Route

The Applicant Preferred Route travels parallel to the segment of the Mississippi River where it is designated as a recreational river district northwest of Monticello. To minimize potential vegetation and visual impacts to the district, the proposed transmission lines could be located on the west side of I-94 or at a maximum feasible distance from the district. Where the route is in closer proximity to the designated Scenic River District, visual impacts can be avoided if the transmission line alignment is located west of I-94. If the proposed transmission line alignment were located on the east side of the route, the ROW occupancy options will minimize potential impacts to the district by maintaining the proposed infrastructure within the interstate corridor. The maximum ROW occupancy would provide the greatest mitigation if the alignment were constructed on the east side of the interstate.

Impacts to the Recreational River District in Clear Lake Township can be avoided if the transmission line alignment is located on the west side of I-94 at this location.

The portion of the Applicant Preferred Route that is located in close proximity to the Scenic River District in Clearwater is wider than the typical 1000-foot-wide route and mitigation measures for this location could include locating the transmission line in the western portion of this route.

Mitigation for reducing visual impacts to recreationalists on the scenic waterway would include located the transmission line and structures outside of the viewshed of this resource. See Section 5.6.3 for the aesthetics discussion of potential mitigation measures associated with visual impacts to the river. The applicant would work with the Minnesota Department of natural resources to locate the transmission line outside the viewshed of recreationalists on the scenic or recreational waterways adjacent to the Applicant Preferred Route.

Route A

Where Route A parallels the I-94 corridor northwest of Monticello, a portion of the Mississippi Recreational River District is within the route. To minimize potential vegetation and visual impacts to the district, the proposed transmission lines could be located on the west side of I-94 or at a maximum feasible distance from the district. Where the route is in closer proximity to the designated Scenic River District, visual impacts can be avoided if the transmission line alignment is located west of I-94.If the proposed transmission line alignment were located on the east side

of the route, the ROW occupancy options will minimize potential impacts to the district by maintaining the proposed infrastructure within the interstate corridor. The maximum ROW occupancy would provide the greatest mitigation if the alignment were constructed on the east side of the interstate.

The portion of Route A that is located in close proximity to the Scenic River District in Clearwater is wider than the typical 1000-foot-wide route and mitigation measures for this location could include locating the transmission line in the western portion of this route.

Mitigation for reducing visual impacts to recreationalists on the scenic waterway would include located the transmission line and structures outside of the viewshed of this resource. See Section 5.8.3 for the aesthetics discussion of potential mitigation measures associated with visual impacts to the river. Exploring the option of locating the transmission line outside of the viewshed of recreationalists on the scenic or recreational waterways adjacent to Alternate Route A with the Minnesota Department of Natural Resources could minimize adverse visual impacts.

Route B

Under the Route B option, no impacts to scenic waterways would occur, and therefore, no mitigative measures are proposed. See Section 5.6.3 in the aesthetics discussion for potential mitigation measures associated with visual impacts to scenic or recreational waterways.

Route C

Under the Route C option, no impacts to scenic waterways would occur, and therefore, no mitigative measures are proposed. See Section 5.6.3 in the aesthetics discussion for potential mitigation measures associated with visual impacts to scenic or recreational waterways.

Route D

Where the route is located within the designated Scenic River District vegetation impacts could be minimized by following the existing transmission alignment for the maximum extent feasible. To avoid impacts to trees, the Applicant would locate the proposed alignment across existing land uses designated as croplands, barren or grassland to the extent feasible at this location.

An existing transmission line exists at the locations where the route crosses the Mississippi River and its designated Scenic and Recreational Districts. The Project would not change the context of the current setting therefore no additional visual impacts are anticipated to scenic waterways and therefore, no mitigative measures are proposed. See the aesthetics discussion in Section 5.6.3 for potential mitigation measures associated with visual impacts to scenic or recreational waterways.

5.11 NATIONAL WILDLIFE REFUGE/WATERFOWL PRODUCTION AREAS

Federally owned or managed lands that protect wildlife habitat and nesting include National Wildlife Refugees (NWRs), WPAs, and U.S. Fish and Wildlife Service (USFWS) easements. These lands are owned and managed by the USFWS to conserve important natural resources. This section discusses potential impacts to federally managed lands in the area of the project.

5.11.1 Affected Environment

While agricultural land uses are an important component of wildlife resources in the Project area, land managed to promote wildlife habitat can provide for higher species diversity and larger populations than surrounding intensively used landscapes. Federally-owned or operated lands including NWRs, WPAs, and USFWS easements conserve resources throughout the state. There are no NWRs within the area of the project but there are some WPAs and USFWS easements in the project vicinity. Refer to Appendix G for a map of natural resources including any NWAs, WPAs or USFWS easements within the project area.

5.11.2 Potential Impacts

Applicant Preferred Route

No sections of the Applicant Preferred Route include or are located within one mile from NWRs or WPAs, and the route does not cross any USFWS easements.

Route A

No sections of Route A include or are located within one mile from NWRs or WPAs, and the route does not cross any USFWS easements.

Route B

No sections of Route B include or are located within one mile from NWRs or WPAs, and the route does not cross any USFWS easements.

Route C

No sections of Route C are located within one mile from WPAs, and the route does not cross any USFWS easements.

There is one WPA within one mile of Route C and no NWRs or USFWS easements within one mile of Route C. The Silver Creek WPA is a 52 acre site located approximately.7 miles south of the route where it deviates from Route B traveling west along 127th Street NE.

Route D

No sections of Route D are located within one mile from WPAs, and the route does not cross any USFWS easements.

Quarry Substation Site 1

No sections of the Quarry Substation Site 1 are located within one mile from WPAs, and the route does not cross any USFWS easements.

Quarry Substation Site 2

No sections of the Quarry Substation Site 2 are located within one mile from WPAs, and the route does not cross any USFWS easements.

Quarry Substation Site 3 and the 115 kV interconnect

No sections of the Quarry Substation Site 3 or the 115 kV interconnect are located within one mile from WPAs, and the route does not cross any USFWS easements.

5.11.3 Mitigation

No impacts on NWRs, WPAs, or USFWS easements are anticipated as a result of any of the proposed routes or substation sites, and therefore, no mitigative measures are proposed.

5.12 AIRPORTS

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

5.12.1 Affected Environment

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

Transmission line construction is limited near public airports due to Federal Aviation Administration (FAA) height restrictions, which prohibit transmission line structures above a certain height depending on the distance from the specific airport. Regulatory obstruction standards only apply to those airports that are available for public use and are listed in the FAA airport directory. Private airports are those that are not available to the general public without prior request and approval.

5.12.2 Potential Impacts

Potential impacts to airports and landing strips are expected to vary by route depending on the proximity of the line to the airport and the particular characteristics of the airport in question. Several airports are located in the vicinity of the Project. See Table 5-24 for airport locations. The closest public-use airport is Leaders Clear Lake Airfield located in Clear Lake, 4.1 miles from the Applicant Preferred Route. The airport is open to the public and has an asphalt and turf runway, 3,000 feet long, oriented north-south. The largest airport is the St. Cloud Municipal Airport located east of St. Cloud and 5.4 miles from the Applicant Preferred Route. The St. Cloud Airport has two runways oriented northwest-southeast and northeast-southwest. The Project would not be close enough to have any impacts on these airports.

There are 10 registered airports within 10 miles of one of the Project areas.

Table 5-24. Airports Within 10 Miles of the Project Area

Airport	Use
Aysta Field	Private
Guggenberger	Private
Leaders Clear Lake	Public
Maple Lake	Public
Miller	Private
Schroeder	Private
Seven Hills	Private
Shadduck	Private
St Cloud Hospital	Private
St Cloud Regional	Public
Triple H	Private

Applicant Preferred Route

No facilities open to public use are expected to be impacted by the Applicant Preferred Route. Seven Hills Airport, a private, non-public use airport, is located within 0.30 miles of the Applicant Preferred Route. The airport has one turf runway (9/27) measuring 2100x25 feet that runs east-west and is marked with reflectors. The eastern end of the runway is approximately 2,300 feet from the edge of the Applicant Preferred Route. A 20:1 approach slope would allow a maximum structure height of 115-191 feet depending on its placement in the route. Using the maximum, minimum, or no route sharing alignments and a 20:1 approach slope, a maximum structure height of less than 149 feet would be required in the approach area.

Route A

No facilities open to public use are expected to be impacted by Alternate Route A. Seven Hills Airport, a private, non-public use airport, is located within 0.30 miles of Route A. The airport has one turf runway (9/27) measuring 2100x25 feet that runs east-west and is marked with reflectors. The eastern end of the runway is approximately 2,300 feet from the edge of Alternate Route A. A 20:1 approach slope would allow a maximum structure height of 115-191 feet depending on its placement in the route. Using the maximum, minimum, or no route sharing alignments and a 20:1 approach slope, a maximum structure height of less than 149 feet would be required in the approach area.

Route B

No facilities open to public use are expected to be impacted by Route B. Seven Hills Airport, a private, non-public use airport, is located within 0.30 miles of the Route B. The airport has one turf runway (9/27) measuring 2100x25 feet that runs east-west and is marked with reflectors. The western end of the runway is approximately 1,450 feet from the edge of Route B. A 20:1 approach slope would allow a maximum structure height of 72-140 feet depending on its placement in the route. Using the Route B alignment and a 20:1 approach slope, a maximum structure height of less than 108 feet would be required in the approach area.

Route C

No facilities open to public use are expected to be impacted by Route C. Seven Hills Airport, a private, non-public use airport, is located within 0.30 miles of the Applicant Preferred Route. The airport has one turf runway (9/27) measuring 2100x25 feet that runs east-west and is marked with reflectors. The western end of the runway is approximately 1,450 feet from the edge of Route B. A 20:1 approach slope would allow a maximum structure height of 72-140 feet depending on its placement in the route. Using the Route C alignment and a 20:1 approach slope, a maximum structure height of less than 108 feet would be required in the approach area.

Route D

No facilities open to public use are expected to be impacted by Route D. The nearest public airport is Leaders Clear Lake Airport, located 2.6 miles north of the proposed route in Clear Lake Township. The nearest private airport is Seven Hills Airport, located 2.0 miles from the route. Other nearby private airports include Miller airport located 2.3 miles north of the route in Clear Lake Township and Aysta Field located 2.3 miles north of the route in Haven Township.

Quarry Substation Site 1

No facilities open to public use are expected to be impacted by quarry substation. The nearest public airport is St Cloud Regional Airport located 10 miles east of the proposed substation area. The nearest private airport is Guggenberger Airport, located 6.1 miles to the northeast in Le Sauk Township

Quarry Substation Site 2

No facilities open to public use are expected to be impacted by quarry substation. The nearest public airport is St Cloud Regional Airport located 10.2 miles east of the proposed substation area. The nearest private airport is Guggenberger Airport 5.3 miles to the northeast in Le Sauk Township.

Quarry Substation Site 3 or the 115 kV Interconnect

No facilities open to public use are expected to be impacted by Quarry Substation Site 3 or the 115 kV Interconnect. The nearest public airport is St Cloud Regional Airport located 10.2 miles east of the proposed substation area. The nearest private airport is Aysta Field located 6.8 miles to the east in Haven Township

5.12.3 Mitigation

Applicant Preferred Route Mitigation

Impacts to this airport from the Applicant Preferred Route could be avoided by utilizing the eastern portion of the route or using pole structures in this area with a height limited to less than 142 feet.

Route A Mitigation

Impacts to this airport from Route A could be avoided by utilizing the eastern portion of the route or using pole structures in this area with a height limited to less than 138 feet.

Route B Mitigation

Impacts to the airport could be avoided by utilizing the western portion of the route or using pole structures in this area with a height limited to less than 84 feet.

Route C Mitigation

Impacts to the airport could be avoided by utilizing the western portion of the route or using pole structures in this area with a height limited to less than 84 feet.

Route D Mitigation

No impacts on airports are anticipated, and therefore no mitigation is proposed.

Quarry Substation Sites 1 and 2 , Quarry Substation Site 3 and Interconnects A and B

No impacts on airports are anticipated, and therefore no mitigation is proposed.

5.13 HIGHWAYS AND ROADS

This section discusses potential impacts and mitigation on local roadways and highways in the area of the project. Paralleling roadways reduces the need for additional right of way. Under the routes evaluated for this project, transmission lines would parallel and cross roads including township roads, county roads, county highways, state highways, and one interstate. Impacts can be anticipated when the transmission line crosses over a roadway or when local or state government expands existing roadways and utility poles require relocation.

5.13.1 Affected Environment

Each of the route alternatives pass through a roadway network consisting of various interstate, state, county, city and other local roadways (Figure 5-2). Many of the roadways in the area are low volume roadways that primarily serve farm to market functions. Through the Wright County Road Department, the Stearns County Public Works Department and the Sherburne County Public Works Department, the counties have responsibility for the operation and maintenance of a system of county roadways. These roadways include county state-aid highways and county roads. Mn/DOT also has responsibility for planning and funding roadway improvements, including interstate highways, U.S. Highways, and state trunk highways.

Applicant Preferred Route

The Applicant Preferred Route primarily follows I-94, though other co-location opportunities including an existing 115 kV transmission line, state highways, other roads and property lines also are utilized.

The Applicant Preferred Route follows Wright County Highway 75 for almost six miles. Wright County Highway 75 is part of the Great River Road, a national scenic byway, which runs for more than 500 miles along the river in Minnesota. See Section 5.6 for a detailed discussion of the potential impacts to the Great River Road.

Table 5-25 lists the main roads that the Preferred Route would follow and traffic data, if available, for those roads.

Table 5-25. Average Annual Daily Traffic for Selected Roads Parallel to the Applicant Preferred Route

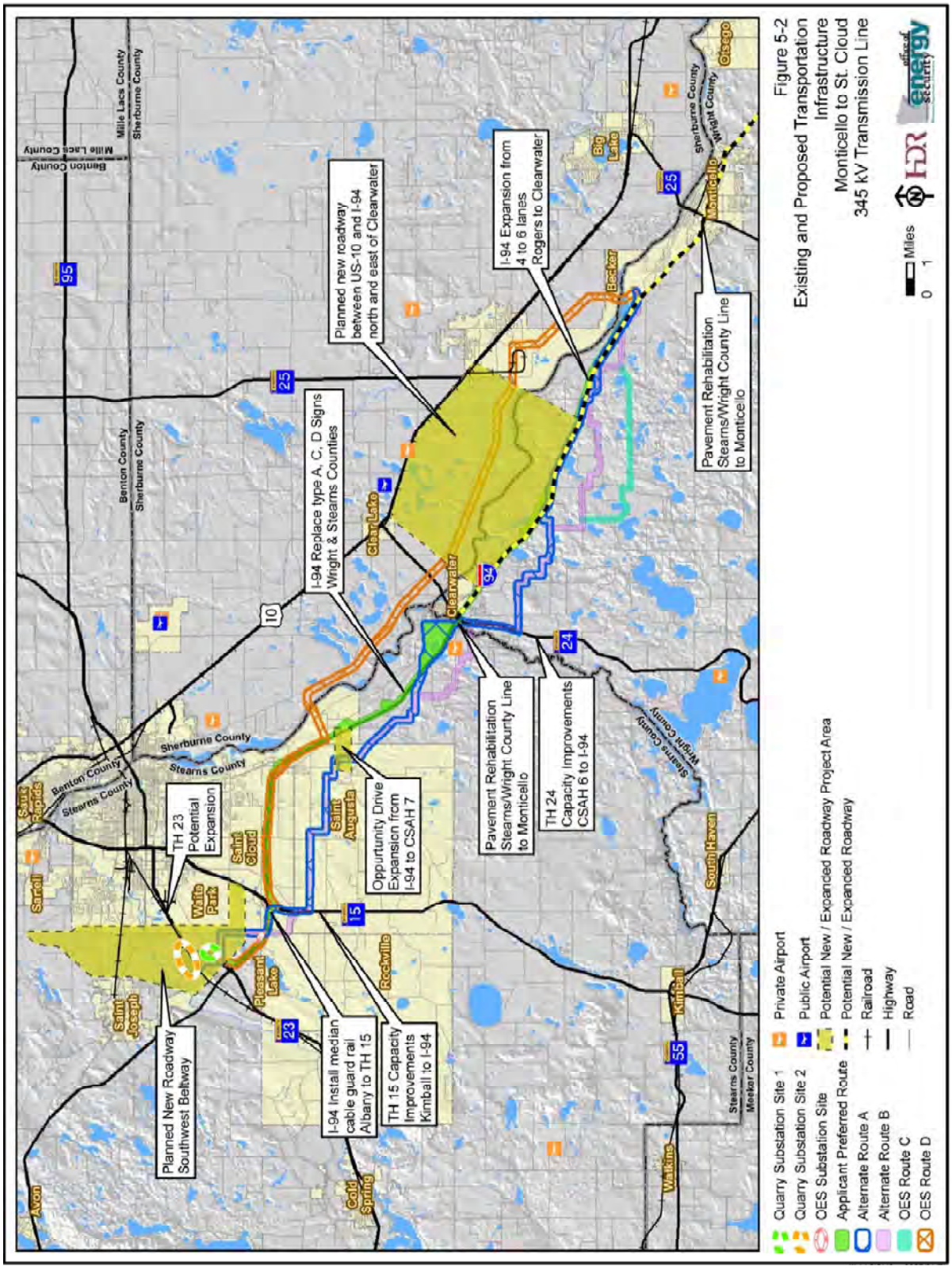
Applicant Preferred Route	Existing Average Annual Daily Traffic	Parallel Length (miles)
150th Street NW	NA	0.4
County Highway 75	NA	5.9
I-94	39,000 to 51,000[a]	19.5
State Highway 23	15,000	1.1

Source: Minnesota Department of Transportation, 2006-2007.

NA: Traffic data is not available for this roadway segment.

[a] *The traffic volume decreases from east (Monticello) to west (St. Cloud) along I-94.*

The Applicant Preferred Route passes by two full service rest stops. There is a rest stop (Enfield) for Eastbound I-94 traffic located 6 miles west of Trunk Highway (TH) 25, and a Westbound I-94 rest stop (Fuller) near Clearwater by the Stearns/Wright County border.


Planned New Roadway Southwest Beltway
I-94 Install median cable guard rail Albany to TH 15
TH 15 Capacity Improvements Kimball to I-94
TH 23 Potential Expansion
Oppurtunity Drive Expansion from I-94 to CSAH 7
Pavement Rehabilitation Stearns/Wright County Line to Monticello
TH 24 Capacity Improvements CSAH 6 to I-94
I-94 Replace type A, C, D Signs Wright & Stearns Counties
Planned new roadway between US-10 and I-94 north and east of Clearwater
I-94 Expansion from 4 to 6 lanes Rogers to Clearwater
Pavement Rehabilitation Stearns/Wright County Line to Monticello
Figure 5-2
Existing and Proposed Transportation Infrastructure
Monticello to St. Cloud
345 kV Transmission Line
Quarry Substation Site 1
Quarry Substation Site 2
CES Substation Site
Applicant Preferred Route
Alternate Route A
Alternate Route B
OES Route C
OES Route D
Private Airport
Public Airport
Potential New / Expanded Roadway Project Area
Potential New / Expanded Roadway
Railroad
Highway
Road
Miles
0 1
HDR
energy
security

Route A

Consideration of public services associated with Route A is similar to those described above for the Preferred Route. The amount of Route A that is adjacent to I-94 is reduced by about 70 percent compared to the Applicant Preferred Route. Although the route is not directly adjacent to the I-94 corridor, it still closely follows the Applicant Preferred Route.

Table 5-26 lists the main roads that Route A would follow and traffic data, if available, for those roads.

Table 5-26. Average Annual Daily Traffic for Selected Roads Parallel to Applicant Route A

Route A	Existing Average Annual Daily Traffic	Parallel Length (miles)
135th Street NW, Silver Creek Township	NA	0.6
137th Street NW, Silver Creek Township	NA	0.2
150th Street NW, Clearwater Township	NA	1.7
160th Street NW, Clearwater Township	220 [a]	1.5
238th Street, St. Augusta	NA	0.3
27th Avenue E, Lynden Township	NA	0.7
41st Avenue, St. Augusta	NA	0.5
Baker Avenue NW, Silver Creek Township	NA	0.3
Stearns County Road 115	1,450	0.3
Stearns County Road 137	390	1.3
Stearns County Road 143	350	.06
Stearns County Road 44	1,550	1.7
Wright County Road 7	690 [a]	0.3
Stearns County Highway 75	2,300	1.0
Wright County Highway 75	3,300 [a]	0.9
Ferman Avenue NW, Silver Creek Township, Clearwater Township	NA	0.2
Grover Avenue NW, Clearwater Township	NA	0.2
I-94, Wright County, Stearns County	39,000 to 51,000 [b]	5.7
State Highway 15, Stearns County	6,600	1.2
State Highway 23, Stearns County	15,000	0.7
State Highway 24, Wright County	17,800	2.0

Source: Minnesota Department of Transportation, 2006-2007

NA: Traffic data are not available for this roadway segment.

[a] Traffic data from 2004.

[b] The traffic volume decreases from east (Monticello) to west (St. Cloud) along I-94.

As with the Applicant Preferred, Route A passes by two full service rest stops. There is a rest stop (Enfield) for Eastbound I-94 traffic located 6 miles west of TH 25, and a Westbound I-94 rest stop (Fuller) near Clearwater by the Stearns/Wright County border.

Route B

Unlike the Applicant Preferred Route, the transmission line along Route B is designed to avoid collocation with I-94 by making use of property lines, cross country segments, and county roads. Other components such as existing 115 kV lines are taken into consideration as well.

Table 5-27 lists the main roads that Route B would follow and traffic data, if available, for those roads.

Table 5-27. Average Annual Daily Traffic for Selected Roads Parallel to Route B

Route B	Existing Average Annual Daily Traffic	Parallel Length (miles)
127th Street NE, Monticello Township, Silver Creek Township	NA	1.9
134th Street NW, Silver Creek Township	NA	0.4
135th Street NE, Silver Creek Township	NA	0.7
137th Street NE, Silver Creek Township	NA	1.0
140th Street NW, Silver Creek Township	NA	1.3
150th Street NW, Clearwater Township, Silver Creek Township	NA	1.0
160th Street NW, Clearwater Township	220[a]	1.5
195th Street E, Lynden Township	NA	0.4
200 Street NW, Lynden Township	NA	0.5
238th Street W, St. Augusta	NA	0.3
41st Avenue, St. Augusta	NA	0.5
Aladdin Avenue NW, Silver Creek Township	NA	0.6
Baker Avenue NW, Silver Creek Township	NA	0.3
Clementa Avenue NW, Silver Creek Township	390[a]	0.2
Stearns County Road 115	1,450	0.3
Stearns County Road 137	390	1.8
Stearns County Road 44	1,550	3.1
Wright County Road 7	690[a]	0.3
Wright County Road 8	1.550[a]	0.3
Dempsey Avenue NW, Silver Creek Township	NA	0.1
Fillmore Avenue NW, Clearwater Township, Silver Creek Township	NA	1.0
Grover Avenue NW, Clearwater Township	NA	0.2
State Highway 15, Stearns County	6,600	0.5
State Highway 23, Stearns County	15,000	0.7
State Highway 24, Wright County	17,800	1.5

Source: Minnesota Department of Transportation, 2006-2007

NA: Traffic data are not available for this roadway segment.

[a] *Traffic data from 2004.*

By design, none of Route B is co-located with I-94. It also follows roads with lower traffic volumes than Route A and has a greater length that does not parallel any road than Route A.

Route C

Route C, indentified on Figure 1-6, is approximately 30 miles in length and is located on the South Side of the Mississippi River. After exiting the Monticello Substation this route parallels Route B for approximately 1 mile. The route travels west for approximately 4 miles and then turns north for about 2.5 miles. The route then parallels Route B in a northwesterly direction taking several turns and jogs (in some areas paralleling Route A), through Monticello, Silver Creek, Clearwater and Lynden Townships in Wright County, for approximately 18.5 miles. The route enters into the St Cloud city limits and travels in a slightly north west direction taking several turns for approximately 4 miles. This route would terminate at one of the Quarry substation locations. Table 5-28 lists the main roads that Route C would follow and traffic data, if available, for those roads.

Table 5-28. Average Annual Daily Traffic for Selected Roads Parallel to Route C

Route C	Existing Average Annual Daily Traffic	Parallel Length (miles)
127th Street NE, Monticello Township, Silver Creek Township	NA	4.8
Wright County Road 8	1.550[a]	0.3
128th Street NW, Monticello Township, Silver Creek Township	NA	1.0
Ferman Ave NW, Silver Creek Township	NA	1.2
140th Street NW, Silver Creek Township	NA	0.3
150th Street NW, Clearwater Township, Silver Creek Township	NA	1.0
160th Street NW, Clearwater Township	220[a]	1.5
195th Street E, Lynden Township	NA	0.4
200 Street NW, Lynden Township	NA	0.5
238th Street W, St. Augusta	NA	0.3
41st Avenue, St. Augusta	NA	0.5
Baker Avenue NW, Silver Creek Township	NA	0.3
Clementa Avenue NW, Silver Creek Township	390[a]	0.2
Stearns County Road 115	1,450	0.3
Stearns County Road 137	390	1.8
Stearns County Road 44	1,550	3.1
Wright County Road 7	690[a]	0.3
Dempsey Avenue NW, Silver Creek Township	NA	0.1
Fillmore Avenue NW, Clearwater Township, Silver Creek Township	NA	1.0
Grover Avenue NW, Clearwater Township	NA	0.2
State Highway 15, Stearns County	6,600	0.5
State Highway 23, Stearns County	15,000	0.7
State Highway 24, Wright County	17,800	1.5

Source: Minnesota Department of Transportation, 2006-2007

NA: Traffic data are not available for this roadway segment.

[a] *Traffic data from 2004.*

Route D

Route D is approximately 30 miles in length and is located on the north side of the Mississippi River. After exiting the Monticello Substation this route would travel north for approximately one mile crossing the Mississippi River. The route would travel in a northwesterly direction for

approximately 20 miles crossing Becker, Clear Lake and Haven townships in Sherburne County. The route would then travel in a southwesterly direction crossing back over the river for one mile where it enters the St Cloud city limits. The route then turns in a northwest direction for two miles and heads straight west for another three miles. The route enters into the St Cloud city limits and travels in a slightly north west direction taking several turns for approximately three miles. This route would terminate at one of the Quarry substation locations.

Table 5-29 lists the main roads that Route D would follow and traffic data, if available, for those roads.

Table 5-29. Average Annual Daily Traffic for Selected Roads Parallel to Route D

Route D	Existing Average Annual Daily Traffic	Parallel Length (miles)
Existing Transmission Line	NA	20
I-94, Stearns County	39,000	8.6
State Highway 23	15,000	1.1

Source: Minnesota Department of Transportation, 2006-2007

NA: Traffic data are not available for this roadway segment.

Quarry Substation Site 1

The Quarry Substation Site 1 is located along the east side of State Highway 23 approximately 0.5 miles northeast of the I-94 and Highway 23 interchange (Figure 1-2). Up to 40 acres would be acquired for the proposed Quarry Substation. The width of any of the Proposed Routes would be up to 1.25 miles in width in the vicinity of the Quarry Substation Site 1 area to allow for substation interconnection flexibility.

Quarry Substation Site 2

The Quarry Substation Site 2 is located along the north side of State Highway 23 approximately one mile northwest of the I-94 and Highway 23 interchange (Figure 1-2). Up to 40 acres would be acquired for the proposed Quarry Substation. The width of any of the Proposed Routes would be up to 1.25 miles in width in the vicinity of the Quarry Substation Site 2 area to allow for substation interconnection flexibility.

Quarry Substation Site 3

The Quarry Substation Site 3 covers approximately 13 total acres in the southeast corner of T124 R29 S36 and the northeast corner of T124 R29 S1 in Stearns County (Figure 1-2). The area is bounded to the north by CSAH 6, to the east by the eastern boundary of T124 R29 S1 and to the south and west by I-94.

5.13.2 Potential Impacts

The primary impacts related to roadways involve compatibility with roadway expansion plans, safety requirements, and temporary construction impacts. Potential impacts to the Great River Road, the Scenic Byway in the project area, are discussed in Section 5.6.

Roadway ROW and Expansion Plans

The applicants have indicated that a 150-foot wide ROW (easement) would be required for the proposed transmission line. Specialty structures may be required for long spans or in environmentally sensitive areas. In these cases, a ROW of up to 180 feet may be required. When a transmission line is placed entirely across private land, an easement for the entire 150-foot to 180-foot-wide ROW would need to be acquired from the landowner(s). The applicants have indicated they would locate the poles as close to property division lines as reasonably feasible to reduce the amount of ROW impact on a particular property.

When paralleling roadways, the applicants plan to install poles just outside the public roadway ROW. Placement of poles would typically range from 5 feet to 25 feet into fields or other private property when possible. Thus, although the pole is still located on private property, the transmission line can occupy some of the public ROW, thereby reducing the size of the easement required from the private landowner. For example, if the required ROW is 150 feet, and the pole is placed five feet off of an existing road ROW, then only an 80-foot easement would be required from the landowner. The roadway and transmission line would share the other 70-foot-wide section of ROW. This strategy reduces the potential of having to relocate utility poles due to future roadway expansions. See Diagrams 1-2 through 1-4 for examples of these scenarios.

In order to share ROW, the applicants would need to acquire necessary approvals from the owner or the agency (e.g., Mn/DOT). Mn/DOT's Utility Accommodation Policy outlines the policies and procedures governing use and collocation of state trunk highway ROWs by utilities. The policy was developed in accordance with the requirements of state and federal law (Code of Federal Regulations, Title 23, Part 645, Subpart B). It is designed to ensure that the placement of utilities does not interfere with the flow of traffic and the safe operation of vehicles.

Mn/DOT has a responsibility to preserve the public investment in the transportation system and to ensure that non-highway uses of the ROW do not interfere with the ability of the state to make long-term highway improvements, such as adding lanes, interchanges, or bridges, or to safely maintain the existing system. In addition, state law requires Mn/DOT to reimburse the utility if a utility must be relocated from an ROW along an interstate highway as a result of future expansion or new interchanges.

Requirements vary based on whether the utility is crossing the highway or being installed parallel to it and based on the type of highway. For controlled access highways or freeways, "The installation of new utility facilities shall not be allowed longitudinally within the ROW of any freeway, except in special cases under strictly controlled conditions." (Mn/DOT Procedures for Accommodation of Utilities on Highway Right of Way – Highways No. 6.4.G-1). This means that the transmission structure–the poles and davit arms–must be completely outside of the ROW. For this Project, this would mean placing a pole approximately 20 to 25 feet outside the ROW.

The Federal Utility Accommodation Policy (Code of Federal Regulations, Title 23, Part 645, Subpart B) does provide for exceptions where special circumstances exist. If the highway is part of the National Highway System, the exception must be approved by the Federal Highway

Administration (FHWA) and would be considered a federal action, meaning that the requirements of the National Environmental Policy Act must be met.

Future Roadway Improvement Projects

Mn/DOT State Transportation Improvement Program contains a list of programmed projects that have received funding for fiscal years 2009-2012. The Mn/DOT Statewide 20-Year Highway Investment Plans: 2009-2028 contains descriptions of planned projects that may be implemented at a future date. Each of these documents was reviewed to determine which programmed (funded) and planned projects may be impacted by the Project alternatives. A summary of these projects is presented in Table 5-30 and illustrated on Figure 5-2.

Table 5-30. Future Roadway Improvements

Transportation Improvement	Project Area	Length	Description	Time-frame	Potential Route Impacts							
					App. Pref. Rte.	Rte A	Rte B	Rte C	Rte D	Quarry Site 1	Quarry Site 2	Quarry Site 3
Opportunity Drive	From I-94 to CSAH 7 in Augusta	NA	Planned extension of roadway	2012-2018[b]	○	◗	◗	◗	○	○	○	○
Southwest Beltway	South and West of Waite Park	NA	Planned new roadway	2012-2020[b]	◗	◗	◗	◗	◗	●	●	○
I-94	Albany to TH 15	20 mi	Install median cable guard rail	2009[a]	◗	◗	○	○	◗	○	○	◗
I-94	Stearns/Wright County Line to Monticello	18 mi	Pavement rehabilitation	2011[a]	●	●	○	○	○	○	○	○
I-94	Wright County, Stearns County	90 mi	Replace type A, C, and D signs	2009-2010[a]	●	◗	○	○	◗	○	○	◗
I-94	Rogers to Clearwater	30 mi	Expansion from 4 lanes to 6 lanes	2009-2018[b]	●	●	○	○	○	○	○	○
TH 15	Kimball to I-94	13 mi	Capacity improvements	2019-2028[b]	○	◗	◗	◗	○	○	○	○
TH 23	Waite Park	7 mi	Potential expansion	2019-2028[b]	●	◗	◗	◗	●	◗	◗	○
TH 24	Wright CSAH 6 to I-94	10 mi	Capacity improvements	2019-2028[b]	○	◗	◗	◗	○	○	○	○

Transportation Improvement	Project Area	Length	Description	Time-frame	Potential Route Impacts							
					App. Pref. Rte.	Rte A	Rte B	Rte C	Rte D	Quarry Site 1	Quarry Site 2	Quarry Site 3
Hwy 10 Interregional Connection	Between US 10 and I-94, north and east of Clearwater	5 mi	Planned new roadway	2015-2023[b]	◗	○	○	○	◗	○	○	○

Sources: a) Mn/DOT State Transportation Improvement Program, projects are funded between 2009 and 2012

b) Mn/DOT Statewide 20-Year Highway Investment 2009-2028 – projects listed are planned, but may not have guaranteed funding for implementation

Key: ● = Potential significant impacts; ◗ = Potential limited impact; ○ = No impacts identified

Roadway ROW and Safety Requirements

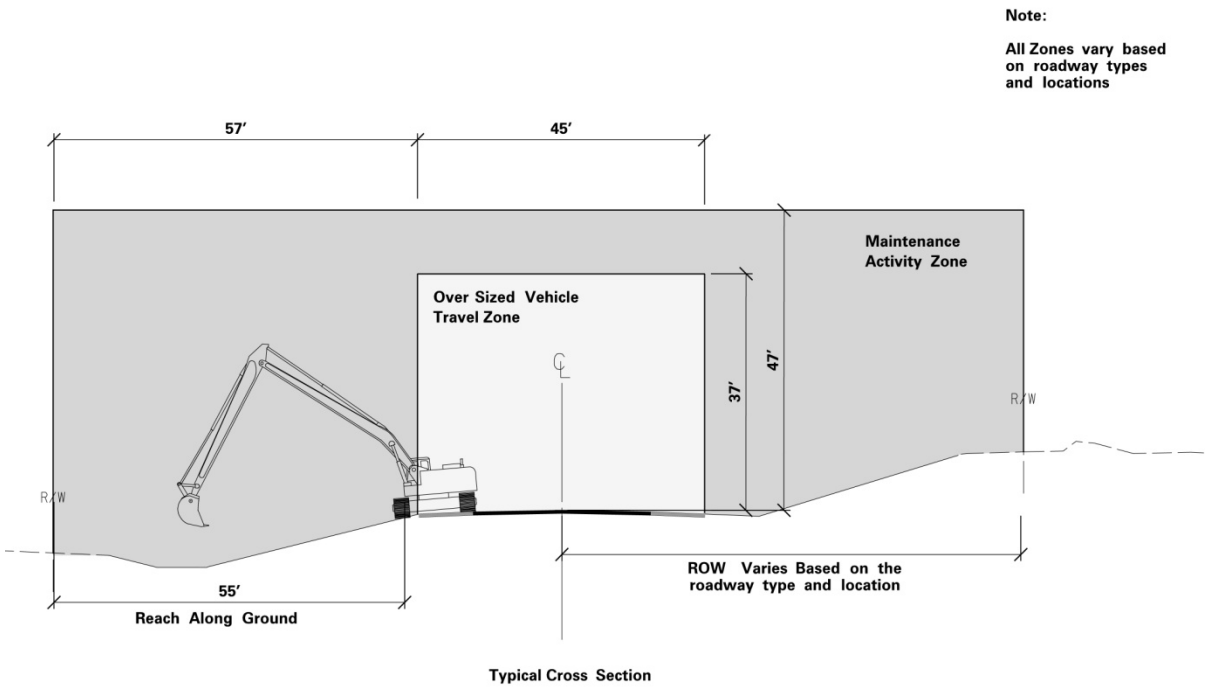
The poles must also be located a sufficient distance from the edge of the traveled roadways so as not to present a safety hazard. Most roadways have clear zones to provide a safety buffer between the roadway and adjacent land uses for errant vehicles. These areas may consist of a shoulder, a recoverable slope, a non-recoverable slope, or a clear run-out area. Requirements for clear zones and roadside obstruction vary based on traffic volume, design speed, roadside geometry, radius of horizontal curve, presence of a curb, and presence of urban or rural roads, collectors, arterials, or freeways. A brief review of clear zone requirements from state and federal manuals provides some guidance.

"For very low-volume local roads, such as township roads, the American Association of State Highway and Transportation Officials state that, "at location where a clear recovery area (an area free of hazards along the edge of a road) of two meters (six feet) or more in width can be provided at low cost and with minimum social/environmental impacts, provision of such a clear recovery area should be considered." (AASHTO Green Book, 2001). However, they also state that where constraints make these impractical, clear recovery areas of less than two meters may be used. They also suggest consideration of other factors such as the presence of vehicles wider than 2.6 m (8.5 ft) such as farm equipment.

The Mn/DOT Road Design Manual Part I and Part II, Chapter 4 (4-6(6)-4-6(20)) provides charts to determine clear zone widths based on speeds and side slope type.

There are 11 different tables in the Minnesota manual for determining clear zone widths based on daily traffic, cut or fill slopes, and design speed. In addition, the State of Minnesota also provides a formula for adjusting the clear zone on the outside of horizontal curves and a table for increasing clear zone widths when there are curbs greater than four inches. Given the complexity of roadway design, it is difficult to generalize about what is considered "safe" in regard to placing transmission line poles adjacent to roadways. The safe zone would have to be determined case by case. To obtain a general sense of this issue, Diagram 5-3 depicts a "zone of activity" or restriction zone as defined by Mn/DOT. In general, impacts to this zone should be avoided to minimize safety related issues associated with normal traffic operations.

Diagram 5-3. Mn/DOT Zone of Activity



Minnesota law generally gives utilities the right to construct facilities along Mn/DOT's ROW so long as such use does not interfere with public safety and convenience. Minor impacts are expected on the existing infrastructure during construction of the Proposed Project for temporary periods of time.

Since the I-94 ROW was acquired by Mn/DOT in part with federal funding, the ROW is also subject to the oversight of both FHWA and Mn/DOT. 23 C.F.R. §645.215(a). FHWA has determined that the accommodation of utility facilities within highway ROW is in the public interest, provided such use or occupancy does not adversely affect highway or traffic safety, or otherwise impair the highway and its aesthetic quality (23 C.F.R. §645.205(a).[2] Mn/DOT has prepared guidelines outlining the conditions under which installations of utility facilities within interstate highway ROW are permitted. Mn/DOT's *Procedures for Accommodation of Utilities on Highway Right of Way*, Mn/DOT Position Statement - Highways No. 6.4, July 27, 1990, revised November 8, 2005 (Accommodation Policy). 23 C.F.R. §645.215(d); See also *Program Guide: Utility Adjustments and Accommodation on Federal-Aid Highway Projects, Sixth Edition*, FHWA-IF-03-014, pp. B-54, B-60 (Jan. 2003).[3]

The Accommodation Policy authorizes longitudinal installations under certain conditions including showing special circumstances. Application of the Accommodation Policy and Mn/DOT's rules, regulations and policies pertaining to longitudinal installations of transmission facilities has been an important factor in analyzing the routes and developing alternatives. In

[2]123 C.F.R. §1.23(c) requires a public interest determination before any non-highway use or occupancy of the right-of-way (including air space) may be authorized.
[3] Available at http://www.fhwa.dot.gov/reports/utilguid/if03014.pdf.

order to more fully evaluate the viability of the I-94 corridor for a transmission line alignment, the Applicants proposed and this EIS analyzes three potential alignments:

- Maximum ROW Occupancy (alignment centerline generally 5 feet outside the edge of I-94 right of way)
- Limited ROW Occupancy (alignment centerline generally 25 feet outside the edge of I-94 right of way)
- No ROW Occupancy (alignment centerline generally 75 feet outside the edge of I-94 right of way)

Any required temporary driveway, road, or lane closures would be coordinated with the local jurisdictions, and would provide for safe access of police, fire, and other rescue vehicles.

The alternatives could have potential safety implications for roadway maintenance. Typical roadway and ROW maintenance activities, such as mowing, refuse and debris removal, and sign replacement and inspections may occur in close proximity to the transmission lines.

The presence of roadway maintenance equipment and personnel near transmission lines may increase the risk of coming into contact with the transmission lines or arc flashes, especially from high temperatures, wind, and precipitation that cause sagging or blowouts.

The type of ROW occupancy option selected may have different impacts on these activities. The greater the amount of ROW occupancy, the greater the potential there is for safety impacts to maintenance activities and personnel. Greater ROW occupancy may potentially place limits on how roadway and ROW maintenance activities are carried out. With the maximum corridor occupancy alignment, the davit arms would encroach into the airspace above the ROW. Under the minimum corridor occupancy alignment alternative the transmission lines could encroach into the airspace above the ROW due to line sway caused by high winds, situations like these are commonly referred to as blowouts. Transmission line maintenance activities could also impact roadway safety and maintenance. In certain constrained areas, access to transmission poles could only be available from the roadway; this would be a notable concern along I-94 where there are higher traffic volumes. For the maximum and minimum ROW occupancy alignment scenarios, transmission line maintenance crews would need to stage their equipment within highway ROW.

According to the Applicant, a severe weather event, such as high winds or icing along the lines, could lead to the lines sagging and possibly breaking. The industry experience indicates, that if an event like this would occur the top part of the structure would tend to bend and snap since it is narrower than the base described below. If the structure were to break, the top portion would fall into the base of the pole structure. The pole structures themselves are supported by 6 to 12 foot diameter foundations that are 20 feet deep, and are unlikely to fall over. These structures are inspected on a monthly basis, and should any deficiencies be detected, the applicant would repair and/or replace the structures. The risk of an entire structure falling onto a road has not been the typical industry experience and is not anticipated to occur.

The safe movement of oversized goods could potentially be impacted by the alternatives. TH 15 from Sauk Centre through Saint Cloud is designated as a Superhaul route, as is I-94 west of the

TH 15 interchange. Superhaul routes are characterized as routes that can handle a 16-foot height limit, a 16-foot width limit with and 8-foot wide axle, a 130-foot length limit and a 235,000 lbs weight limit. Mn/DOT is responsible for preserving the ability to accommodate these characteristics and improve upon them if feasible.

Temporary Construction Impacts

Most of the transportation related impacts due to the Project would be from construction activities and temporary in nature. Temporary access for the construction of the new transmission lines within any of the routes and variations would require a 20-foot-wide access trail constructed within the transmission line ROW or by short spur trails from the existing road network to the ROW. In some situations, private field roads or trails are used. Permission form the property owner is obtained prior to accessing the transmission line route. New access roads may also be constructed when no current access is available or if the existing access is inadequate.

Temporary guard structures would be used to string conductor over existing roads and railroads. The structures typically consist of directly imbedded poles with a horizontal cross piece to support the conductor at sufficient height above traffic.

Temporary traffic impacts associated with construction equipment include material delivery and worker transportation. Typical construction equipment used on similar transmission line projects include tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed tractor trailers, flatbed trucks, pickup trucks, concrete trucks and various trailers. Many types of excavation equipment are set on wheel or track-driven vehicles. Poles are transported on tractor-trailers.

It is estimated that construction of the transmission line and substation modifications would require 40 full-time employees with 25 devoted to transmission line construction and 15 to substation modifications. Part-time personnel may also be needed. Construction of the concrete foundations for the pole is estimated to require 5-6 concrete trucks. Given the small number of workers and construction vehicles, traffic disruptions would be minimal and localized.

Staging areas are usually established for the Project, as well as temporary lay-down areas. Materials are delivered to staging areas and stored until they are needed. Any staging or temporary lay-down areas outside of the transmission ROW would require permission from the landowners through rental agreements.

Applicant Preferred Route

Construction activities along the Applicant Preferred Route have the potential to impact future roadway projects. Programmed projects include a signing replacement project along I-94 in Stearns and Wright counties, a repaving of I-94 in Wright County, and the installation of median cable guard rail along I-94 from Albany to TH 15. There are also planned projects that may be constructed at a later date, including the expansion of I-94 from 4 lanes to 6 lanes between Rogers and Clearwater, a potential expansion of TH 23 in Waite Park/St. Cloud, and the I-94

and State Highway 10 Interregional Connection, a partially new roadway connecting I-94 to Highway 10, located north and east of Clearwater.

The Preferred alignment also has the potential to impact the Southwest Beltway Project. This Project, which seeks to provide a new transportation link between communities such as St. Cloud, St. Joseph, Sartell, Waite Park and Sauk Rapids is currently in the scoping stages. There are two potential alignment routes (West and Central) that pass through the Preferred Route within the vicinity of the Quarry Substation Site 1 and Site 2.

Impacts to roadway traffic flow during construction are expected to be minimal. Temporary guard structures would be used to string conductor over existing roads and railroads. The structures typically consist of directly imbedded poles with a horizontal cross piece to support the conductor at sufficient height above traffic. It is estimated that construction of the transmission line and substation modifications would require 40 full-time employees with 25 devoted to transmission line construction and 15 to substation modifications. Part-time personnel may also be needed. Construction of the concrete foundations for the pole is estimated to require 5-6 concrete trucks. Given the small number of workers and construction vehicles, traffic disruptions would be minimal and localized.

Route A

Transportation related impacts associated with Route A are similar to those described above for the Preferred Route. Most of the impacts are primarily from construction activities and would be temporary in nature. New access roads may also be constructed when no current access is available or if the existing access is inadequate.

Construction activities along Route A have the potential to impact future roadway projects. Programmed projects include a signing replacement project along I-94 in Stearns and Wright counties, a repaving of I-94 in Wright County, and the installation of median cable guard rail along I-94 from Albany to TH 15. There are also planned projects that may be constructed at a later date, including the expansion of I-94 from 4 lanes to 6 lanes between Rogers and Clearwater, capacity improvements of TH 15 between Kimball and I-94, capacity improvements to TH 24 from Wright CSAH 6 to I-94 in Clearwater, a potential expansion of TH 23 in Waite Park/St. Cloud, and a possible extension of Opportunity Drive from I-94 to CSAH 7 in St. Augusta.

The Route A alignment also has the potential to impact the Southwest Beltway Project. There are two potential alignment routes (West and Central) that pass through Route A within the vicinity of the Quarry Substation Site 1 and Site 2.

Route B

Transportation related impacts associated with Route B are similar to those described above for the Preferred Route. Most of the impacts are primarily from construction activities and would be temporary in nature. New access roads may also be constructed when no current access is available or if the existing access is inadequate.

Construction activities along Route B have the potential to impact future roadway projects. Programmed projects include a signing replacement project along I-94 in Stearns and Wright

counties, a repaving of I-94 in Wright County, and the installation of median cable guard rail along I-94 from Albany to TH 15. Because Route B parallels I-94 for only a very short distance (less than one mile), potential impacts to these projects are unlikely. There are also planned projects that may be constructed at a later date, including the expansion of I-94 from 4 lanes to 6 lanes between Rogers and Clearwater, capacity improvements of TH 15 between Kimball and I-94, capacity improvements to TH 24 from Wright CSAH 6 to I-94 in Clearwater, a potential expansion of TH 23 in Waite Park/St. Cloud and a possible extension of Opportunity Drive from I-94 to CSAH 7 in St. Augusta.

The Applcant Route B alignment also has the potential to impact the Southwest Beltway Project. There are two potential alignment routes (West and Central) that pass through Route B within the vicinity of the Quarry Substation Site 1 and Site 2.

Transportation related impacts associated with Route C are similar to those described above for Route B. Most of the impacts are primarily from construction activities and would be temporary in nature. New access roads may also be constructed when no current access is available or if the existing access is inadequate.

Route C

Construction activities along Route C have the potential to impact future roadway projects. Programmed projects include a signing replacement project along I-94 in Stearns and Wright counties, a repaving of I-94 in Wright County, and the installation of median cable guard rail along I-94 from Albany to TH 15. Because Route C parallels I-94 for only a very short distance (less than one mile), potential impacts to these projects are unlikely. There are also planned projects that may be constructed at a later date, including the expansion of I-94 from 4 lanes to 6 lanes between Rogers and Clearwater, capacity improvements of TH 15 between Kimball and I-94, capacity improvements to TH 24 from Wright CSAH 6 to I-94 in Clearwater, a potential expansion of TH 23 in Waite Park/St. Cloud and a possible extension of Opportunity Drive from I-94 to CSAH 7 in St. Augusta.

The Route C alignment also has the potential to impact the Southwest Beltway Project. There are two potential alignment routes (West and Central) that pass through Route C within the vicinity of the Quarry Substation Site 1 and Site 2.

Route D

Transportation related impacts associated with Route D are similar to those described above for the Preferred Route. Most of the impacts are primarily from construction activities and would be temporary in nature. New access roads may also be constructed when no current access is available or if the existing access is inadequate.

Construction activities along Route D have the potential to impact future roadway projects. Programmed projects include a signing replacement project along I-94 in Stearns and Wright counties, and the installation of median cable guard rail along I-94 from Albany to TH 15. There are also planned projects that may be constructed at a later date, including a potential expansion of TH 23 in Waite Park/St. Cloud, and the I-94 and State Highway 10 Interregional Connection, a partially new roadway connecting I-94 to Highway 10, located north and east of Clearwater.

The Route D alignment also has the potential to impact the Southwest Beltway Project. There are two potential alignment routes (West and Central) that pass through Route D within the vicinity of the Quarry Substation Site 1 and Site 2.

Quarry Substation Site 1

Additional roadways/driveways would need to be constructed to provide access to the site. Access to the substation may be provided from Highway 23 directly via a new access roadway or by making use of existing nearby access points at Julep Road and Bel Clare Drive. Access to the substation may also be provided off of Indigo Road or 86th Avenue on the south and west side of the site. It is important to note that access to the site may require crossing the Northern Lines Railway. The Northern Lines railway is a Class III short line railroad that is 25 miles in length that provides access between various industrial sites in the St. Cloud area to the BNSF mainline on a daily basis. Any new access road would require creating a new crossing of the Northern Lines Railway, and would require coordination and permission from the railroad. No additional railroad crossings would be required if the access roads utilize the existing railroad crossings at Julep Road and Indigo Road. Regardless of whether or not new access roads are constructed over the railway, additional traffic would be crossing the railway during construction, operation, and maintenance of the substation.

The Quarry Substation Site 1 also has the potential to impact the Southwest Beltway Project. There are two potential alignment routes (West and Central) that pass within the vicinity of the Quarry Substation Site 1.

Quarry Substation Site 2

Additional roadways/driveways would need to be constructed to provide access to the site. Access to the substation may be provided from Highway 23 directly via a new access roadway, or by making use of the existing nearby access points at Bel Clare Drive.

The Quarry Substation Site 2 also has the potential to impact the Southwest Beltway Project. There are two potential alignment routes (West and Central) that pass within the vicinity of the Quarry Substation Site 2.

Quarry Substation Site 3

Additional roadways/driveways would need to be constructed to provide access to the site. Access to the substation may be provided from County Highway 6. The most likely route vehicles would take to the site for construction and ongoing maintenance include TH 23 (from I-94), Bel Clare Drive, County Road 137, and County Highway 6.

5.13.3 Mitigation Measures

Temporary guard structures would be used to string conductor over existing roads and railroads. The structures typically consist of directly imbedded poles with a horizontal cross piece to support the conductor at sufficient height above traffic.

Temporary access trails constructed outside the transmission line ROW would require coordination and permission from the landowner. In some situations, private field roads or trails

are used. Permission form the property owner would be obtained prior to accessing the transmission line route.

The construction contractor would coordinate construction activities with the appropriate road agencies to avoid interference with their roadway construction and maintenance activities. Any staging or temporary lay-down areas outside of the transmission ROW would require permission from the landowners through rental agreements. The construction contractor would work with the appropriate agencies to minimize impacts on roadway clear zones and rest areas.

Additional shielding of the transmission lines and equipment may be required in areas where roadway and ROW maintenance activities are expected to occur in close proximity with the transmission lines on a regular basis.

During final design the ultimate placement of the transmission line poles will be located. There is some flexibility in determining the final location of each pole which will allow the Applicant to minimize impacts to roadways.

The additional construction and maintenance traffic on the surrounding roadway system is not anticipated to have a significant impact on traffic operations; no mitigation is required.

5.14 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Archaeological and historic facility resources are those places that represent the visible or otherwise tangible record of human activity on the landscape. These resources vary in size, shape, condition, and importance, among other considerations; some are buried, while others are clearly evident on the landscape. The resources include pre-contact (Native American) archaeological sites, historic-period (Euroamerican) archaeological sites, and 19th and 20th century buildings, bridges, railroads, and industrial sites.

Definitions of terms clarify the meaning of locations as they relate to the project. The 'Project' refers to any action taken to construct or operate the transmission line. The 'Project Route' refers to the impact area of the transmission line whether from construction or operation. The 'Project Study Area' refers to the Project Route plus one mille buffer from the edge of the Project Route. An 'archaeological resource' refers to any surface or buried resource showing past human activity. A 'historic facility resource' refers to any standing post contact building or structure. A 'historic landscape' as defined by the National Park Service refers to, "a geographic area, including both cultural and natural resources and the wildlife or domestic animals therein, associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values". The 'Applicant' refers to Xcel Energy and Great River Energy.

In January of 2009 the Applicant reviewed records in the Minnesota State Historic Preservation Office (SHPO) archaeological and historic facility database. Records were reviewed to document previously identified resources within the Project Study Area. In addition, in November 2009 the Applicant reviewed archaeological records, historic facility records, and previous cultural resource inventory reports at SHPO to update data within the existing Project Study Area/Project Route and to gather information on the Office of Energy Security's (OES) identified Routes.

Regardless of the transmission line route or substation location selected, the Applicant will follow the process outlined below in Mitigative Measures to formally consider archaeological resources, historic facility resources and historic landscapes as they relate to the Project. Project documentation should follow the guidelines set up in the "SHPO Manual for Archaeological Projects in Minnesota" and the "Guidelines for History/Architecture Projects in Minnesota". Documentation prepared in this manner will allow the permitting agency to adequately review and consider the impact of this Project upon the resources identified within the Project Route.

Please note the information generated below was compiled using the text from sections 7.2.4, 7.3.4, and 7.4.4 of the "Application to the Minnesota Public Utilities Commission for a Route Permit for the Monticello to St. Cloud 345 kV Transmission Line Project" Docket # ET-2, E002/TL-09-246 and a report entitled "Executive Summary Literature Search of Cultural and Architectural Resources".

5.14.1 Previous Cultural Resource Inventory Reports

Thirty-six previous cultural resource inventory reports have been conducted within one mile of the proposed routes. These reports were completed to document a variety of different projects, such as: road improvement, pipeline corridors, electric transmission routes, electric generation

plant, and commercial/residential and state park development. These reports identified multiple archaeological and historic facility resources within the Project Study Area.

5.14.2 Preferred Route

The Preferred Route contains four archaeological resources and two historic facility resources located within 500 feet of the centerline of the Preferred Route. One of the four archaeological resources is represented by a historic artifact scatter and structural ruin and has been found eligible for listing in National Register of Historic Places (NRHP). The remaining resources represent prehistoric isolated finds and/or prehistoric artifact scatters related to the Woodland period. One of the two historic facility resources is represented by a bridge and the other resource has no data to identify or support its form or function. Neither of the historic facility properties has been evaluated for listing in NRHP. Project plans and engineering efforts will strive to avoid all of these resources.

No other archaeological resources, historic facility resources, or historic landscapes have been identified within the Project Study Area of the Preferred Route.

5.14.3 Alternate Route A

Three archaeological resources and four historic facility resources are located within 500 feet of the centerline of the Alternate Route A. One of the archaeological resources is a historic artifact scatter/structural ruin that is eligible for listing in the NRHP. The other two archaeological resources have not been evaluated for listing in the NRHP. The four historic facilities resources have not been evaluated for listing in the NRHP. Project plans and engineering efforts will strive to avoid all of these resources.

No other archaeological resources, historic facility resources, or historic landscapes have been identified within the Project Study Area of Route A.

5.14.4 Alternate Route B

Two archaeological resources and two historic facility resources are located within 500 feet of the centerline of Alternate Route B. Neither archaeological resource have been evaluated for listing in the NRHP. Neither historic facility resource has been evaluated for listing in the NRHP. Project plans and engineering efforts will strive to avoid all of these resources.

No other archaeological resources, historic facility resources, or historic landscapes have been identified within the Project Study Area of Route B.

5.14.5 Route C

No archaeological or historic facility resources have been found within 500 feet of the centerline of Route C.

5.14.6 Route D

One archaeological resource has been found within 500 feet of the centerline of Route D. This site has not been evaluated. No historic facility resources have been found within 500 feet of the centerline of Route D.

5.14.7 Quarry Substation Sites 1 and 2

No previously identified archaeological resources, historic facility resources, or historic landscapes have been identified within the Project Study Area.

5.14.8 Quarry Substation Site 3 and 115 kV Interconnect

No information is available concerning this location as it relates to cultural resources within the application.

Mitigative Measures

Impacts to archaeological resources occur from ground disturbing activities during construction or operation of the Project. These impacts can compromise the integrity of the resource. Eight archaeological resources have been identified within the Applicant proposed Project Routes. Impacts to these resources can be avoided by clear designation of the resource area, adjustments to the construction footprint, and designation of no construction and operation buffers around the resources. Archaeological resource inventories should be completed in areas of proposed ground disturbance to identify undocumented archaeological resources. If any resource can't be avoided, resource evaluation leading to specific treatment would be developed by the Applicant in coordination with SHPO, Office of the State Archaeologist (OSA) to mitigate the adverse impact caused by this Project.

Impacts to historic facility resources can result from physical damage to the facility or from construction/operation of the Project. Indirect impacts can result from visual intrusions of Project elements on the historic character or historic setting of the facility. Eight historic facility resources have been identified within or near the three Applicant designated routes. Direct impacts to these resources can be avoided by identifying no construction and/or operation buffers, adjustment to Project design so as to not impact the historic facilities physical makeup, and understand construction techniques so as to not harm historic facility resource foundations. In addition, indirect impacts to a historic facility should be considered and treatment techniques should be developed in coordination with SHPO the Commission, and possibly the OSA.

The Applicant does not anticipate impacts to previously identified resources within the three Applicant selected routes as a result of Project construction and/or operation. Avoidance will be used as a first step to mitigate impacts to resources. In the event that an impact occurs, coordination with SHPO the OSA, and the Commission would be needed and if applicable, further evaluation of the impacted resource to understand its eligibility for listing in the NRHP.

To understand the possible impacts to resources from Project construction or operation, mitigation will include a Phase Ia Literature Search completed to the Secretary of Interior Standards and Guidelines for Archaeology and Historic Preservation for the selected route. The Phase Ia Literature Search should identify all previously known cultural resources and all previously known cultural investigations within the selected route. This information, possibly combined with other supplementary information, will identify the types of additional archaeological or historic facility resources that could be located within the selected route and will allow the applicant to develop a survey methodology appropriate for locating such

resources. The survey methodology should detail the process, parameters, and types of survey that will be used to locate additional resources within the Project Area.

Once the Phase Ia Literature Search is completed a meeting between the Applicant, SHPO and the OSA should occur to discuss the data and survey contained within the report. In particular, survey methodology should be reviewed and discussed until all parties are comfortable that the survey methodology will accomplish the task it is designed to do. SHPO and OSA should be engaged to elicit any specific knowledge they have concerning the selected route.

A Phase I Reconnaissance Survey will be conducted within the selected route to identify additional archaeological and historic facility resources. This survey should be completed to the Secretary of Interior Standards and Guidelines for Archaeology and Historic Preservation. The applicant may want to engage the public at this point to see if any additional information relating to cultural resources is known. This identification of the resources within the selected route will inform the applicant of the potential impacts possible from project construction or operation. Once the survey inventory is complete and project design has been considered in relation to these resources, communication should occur between the Applicant, SHPO and the OSA to discuss the resources that will be impacted. The Applicant, SHPO and the OSA should develop an evaluation strategy for each of these resources to be impacted.

Once an evaluation strategy for the impacted resources is complete, mitigation will include a Phase II Intensive Survey at these identified locations. The Phase II Intensive Survey should be completed to the Secretary of Interior Standards and Guidelines for Archaeology and Historic Preservation and should use the National Register Criteria to provide the Applicant, SHPO and the OSA with data as to whether the resource is eligible for listing in the NRHP or not. Those resources deemed significant and eligible for listing in the NRHP will require treatment. These treatment plans should be developed by the Applicant in coordination with SHPO and the OSA and any other identified applicable party.

After the treatment plans have been completed, mitigation includes Phase III Treatment Activities. The Phase III Treatment Activity allows the Applicant to operate and construct the Project, while addressing the impacts to NRHP eligible resources. The result of the Phase III Treatment Activities is to provide the Applicant, SHPO and the OSA with documentation that the treatment plans developed in correlation with Phase II Intensive Survey were carried out and completed in full.

A possible approach to ease construction deadlines may be for the Applicant to construct the Project in a staged construction approach. A staged construction approach means that when the Phase I Inventory Survey is complete, those locations within the selected route without documented resources identified on them may have construction work initiated on them. In addition, as resources are determined not eligible or treated, then those locations would be available for construction. SHPO and the OSA would need to be confident that the Phase I Inventory Survey was adequate and complete for this approach for validity.

5.15 RARE AND UNIQUE NATURAL RESOURCES/CRITICAL HABITAT

This section discusses the threatened and endangered species protected under Minn. Stat. §84.895, and under Section 7 of the Endangered Species Act and areas of biodiversity significance that could be associated with rare and unique species and habitats.

5.15.1 Affected Environment

The MnDNR and USFWS have been involved in coordination efforts regarding these resources. These resources were identified using the MnDNR Natural Heritage Information System (NHIS). Threatened and endangered species are often found within high quality rare and unique habitats and features (e.g., SNAs), which could also be identified using NHIS. Many of the threatened and endangered species identified in the Project area are associated with wetland and other habitats associated with water resources. River species of mussels are encountered in major rivers within the one mile buffer, particularly the Mississippi River, which is crossed by the Project in one alternative.

In addition to the rare and unique habitats that are identified by NHIS, the MnDNR MCBS data documents high quality native habitats. The MCBS data were reviewed to determine if there were areas with moderate, high, or outstanding biodiversity significance within the Project area. The purpose of the data is to identify areas that have been surveyed in order to provide the areas of statewide biodiversity significance can be prioritized for preservation.

The MCBS Sites of biodiversity significance are ranked and organized into three classifications. A biodiversity significance rank is assigned based on the number of rare species, the quality of the native plant communities, size of the site, and context within the landscape. Areas of "outstanding" significance are sites that "contain the best occurrences of the rarest species, the most outstanding examples of the rarest native plant communities, and/or the largest, most intact functional landscapes in the state." Areas mapped as "high" significance are sites that "contain very good quality occurrences of the rare species, high-quality examples of rare native plant communities, and/or important functional landscapes." Areas mapped as "moderate" are sites that "contain occurrences of rare species, moderately disturbed native plant communities, and /or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes." There are no occurrences of MCSB outstanding significance areas crossed by the Project; however, are designated as high significance, and for having moderate significance are found in the area of the project.

As discussed in sections above, WMAs, SNAs, NWRs, WPAs, and USFWS easements often have native or restored habitats that could harbor threatened and endangered species. Refer to Sections 5.9 and 5.11 for a discussion of impacts and mitigation associated with each of the resources.

5.15.2 Potential Impacts

Applicant Preferred Route

The search of the MnDNR's NHIS showed that one state-listed threatened species (Blanding's turtle, *Emydoidea blandingii*) is known to occur within the Applicant Preferred Route. The review

of the NHIS database within one mile of the route identified a total of ten different species. There were no occurrences of federally listed species; one state-listed endangered species, two state-listed threatened species, and seven different species of special concern documented within a one mile area of the Applicant Preferred Route (See Table 5-31). No critical habitat occurs within one mile of the Applicant Preferred Route. There are no documented federally listed species occurring within one mile of the Applicant Preferred Route.

Table 5-31. Rare and Unique Resources – Applicant Preferred Route

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian flycatcher	*Empidonax virescens*	2	SC	S3
Bald eagle	*Haliaeetus leucocephalus*	4	SC	S3
Cerulean warbler	*Dendroica cerulea*	2	SC	S3
Peregrine falcon	*Falco peregrinus*	1	THR	S2
Red-shouldered hawk	*Buteo lineatus*	1	SC	S3
Amphibians				
Blanding's turtle	*Emydoidea blandingii*	6	THR	S2
Invertebrates				
Black sandshell	*Ligumia recta*	5	SC	S3
Plants				
Butternut	*Juglans cinera*	1	SC	S3
Hill's thistle	*Cirsium billii*	2	SC	S3
Tubercled rein-orchid	*Plantanthera flava var. herbiola*	18	END	S1

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed).*

The Applicant Preferred Route includes MCBS areas ranked high for biodiversity significance northwest of Monticello. These areas include tree coverage of primarily oak (*Quercus sp.)* species between I-94/County highway 75 and the Mississippi River. Temporary impacts to the area may occur during construction and permanent impacts to vegetation may occur if the transmission line alignment does not share existing ROW with I-94 or County highway 75.

West of Clearwater an MCBS area ranked moderate for biodiversity significance, less than seven acres in size, and the western edge of a larger MCBS area are located along the eastern edge of the Applicant Preferred Route. The MSBS area vegetation cover includes oak (*Quercus sp.)* species tree coverage and a baseball diamond. Temporary construction impacts and permanent vegetation impacts may occur to this area if the transmission line is constructed along the eastern border of the route.

Southeast of St. Augusta, the Applicant Preferred Route includes an MCBS area approximately six acres in size ranked moderate for biodiversity significance. The vegetation cover is a mix of

oak (*Quercus sp.)* species and upland shrubs that border the east side of I-94. Permanent impacts to vegetation and temporary construction impacts may occur if the transmission line alignment is located east of I-94 at this location.

South St. Cloud the Applicant Preferred Route includes an MCBS area less than four acres in size ranked high for biodiversity significance. Temporary construction impacts and permanent vegetation impacts may occur to this area comprised of lowland deciduous shrub coverage if the transmission line is constructed along the north side of I-94 at this location.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within the Applicant Preferred Route reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. See Table 5-32 for impacts on Rare and Unique Natural Resources/Critical Habitat.

Table 5-32. Rare and Unique Natural Resources/Critical Habitat – Applicant Preferred Route

Applicant Preferred Route	Number of MCBS Sites of Biodiversity Significance Crossed within ROW*	ROW MCBS Sites of Biodiversity Significance (acres)*	ROW Percent of MCBS Sites of Biodiversity Significance*	State Listed T&E or Candidate Species within Route**	State Listed T&E or Candidate Species Occurrences within Route**	State Listed T&E or Candidate Species within 1-mile of Route**	State Listed T&E or Candidate Species Occurrences within 1-mile of Route**
Maximum Interstate ROW occupancy	3	18	3.5%	1	1	10	42
Minimum Interstate ROW occupancy	3	19	3.7%	1	1	10	42
No Interstate ROW occupancy	3	19	3.6%	1	1	10	42

**MnDNR Data Deli*

*** Threatened and Endangered Species were identified using data licensed from the MnDNR for this project.*

Route A

This section focuses on federal and state protected species and rare and unique communities within one mile of Route A. While state non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered. The review of the NHIS database within one mile of the route corridor identified a total of 11 different species. The search of the MnDNR's NHIS showed

that one state-listed threatened species (Blanding's turtle, *Emydoidea blandingii)* is known to occur within Route A. There were no occurrences of federally listed species; one state-listed endangered species, three state-listed threatened species, and seven different species of special concern documented within a one mile area of Route A. No critical habitat occurs within one mile of Alternate Route A.

Table 5-33. Rare and Unique Resources – Route A

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian flycatcher	*Empidonax virescens*	2	SC	S3
Bald eagle	*Haliaeetus leucocephalus*	3	SC	S3
Cerulean warbler	*Dendroica cerulea*	3	SC	S3
Peregrine falcon	*Falco peregrinus*	1	THR	S2
Trumpeter swan	*Cygnus buccinator*	1	THR	S2
Red-shouldered hawk	*Buteo lineatus*	3	SC	S3
Amphibians				
Blanding's turtle	*Emydoidea blandingii*	5	THR	S2
Invertebrates				
Black sandshell	*Ligumia recta*	4	SC	S3
Creek heelsplitter	*Lasmigona compressa*	1	SC	S3
Plants				
Hill's thistle	*Cirsium billii*	2	SC	S3
Tubercled rein-orchid	*Plantanthera flava var. herbiola*	4	END	S1

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed).*

Where Route A parallels the Applicant Preferred Route northwest of Monticello, it also includes MCBS areas ranked high for biodiversity significance. These areas include tree coverage of primarily oak species between I-94/County highway 75 and the Mississippi River. In addition to impacting the MCBS area affected by the Applicant Preferred Route east of I-94, Applicant Route A would also impact the MCBS area of high biodiversity west of I-94 where the oak community is interspersed with other vegetative land cover such as grasslands, lowland deciduous, and crop lands. Temporary construction impacts and permanent impacts to vegetation may occur if the transmission line alignment does not share ROW with I-94 or County Highway 75.

Similar to the Applicant Preferred Route a small portion of an MCBS area ranked moderate for biodiversity significance is located west of Clearwater. Resources and impacts are similar to those described for the Applicant Preferred Route.

Although specific alignments have not yet been determined, I-94 corridor occupancy alignments proposed within Route A reflect the co-location of the transmission line with the transportation corridor as described in Section 1.5. See Table 5-34 for impacts on Rare and Unique Natural Resources/Critical Habitat.

Table 5-34. Rare and Unique Natural Resources/Critical Habitat – Route A

Route A	Number of MCBS Sites of Biodiversity Significance Crossed within ROW*	ROW MCBS Sites of Biodiversity Significance (acres)*	ROW Percent of MCBS Sites of Biodiversity Significance*	State Listed T&E or Candidate Species within Route**	State Listed T&E or Candidate Species Occurrences within Route**	State Listed T&E or Candidate Species within 1-mile of Route**	State Listed T&E or Candidate Species Occurrences within 1-mile of Route**
Maximum Interstate ROW occupancy	4	12	2.0%	1	1	11	29
Minimum Interstate ROW occupancy	4	14	2.4%	1	1	11	29
No Interstate ROW occupancy	4	17	2.8%	1	1	11	29

**MnDNR Data Deli*

*** Threatened and Endangered Species were identified using data licensed from the MnDNR for this project.*

Route B

This section focuses on federal and state protected species and rare and unique communities within one mile of Route B. While state non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered. The review of the NHIS database within one mile of the route identified 11 different species.

There were no occurrences of federally listed species; one state-listed endangered species, three state-listed threatened species, and seven different species of special concern documented within a one mile area of Route B. No critical habitat occurs within one mile of Route B.

Table 5-35. Rare and Unique Resources – Route B

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian flycatcher	*Empidonax virescens*	2	SC	S3
Bald eagle	*Haliaeetus leucocephalus*	3	SC	S3
Cerulean warbler	*Dendroica cerulea*	6	SC	S3
Peregrine falcon	*Falco peregrinus*	1	THR	S2
Trumpeter swan	*Cygnus buccinator*	1	THR	S2
Red-shouldered hawk	*Buteo lineatus*	4	SC	S3
Amphibians				
Blanding's turtle	*Emydoidea blandingii*	5	THR	S2
Invertebrates				
Black sandshell	*Ligumia recta*	3	SC	S3
Creek heelsplitter	*Lasmigona compressa*	1	SC	S3
Plants				
Hill's thistle	*Cirsium billii*	1	SC	S3
Tubercled rein-orchid	*Plantanthera flava var. herbiola*	4	END	S1

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed).*

West of the Monticello substation and the I-94 corridor, Route B includes MCBS areas ranked high for biodiversity significance. These areas border both sides of 127th Street NE which is paralleled by the route. The tree coverage in the area consists of oak (*Quercus sp.)* species primarily with grasslands, lowland deciduous shrubs, sedge meadow, upland shrubs, grasslands and cropland. Temporary impacts to the area may occur during construction and permanent impacts to vegetation would occur even if the transmission line alignment does share existing ROW 127th Street NE due to the proximity of the MCBS to the roadway and throughout the route at this location.

Route B includes an area ranked high for biodiversity significance in Silver Creek Township, along the south side of 137th Street NW. The vegetation cover in this area is red oak (*Quercus rubra*). Temporary construction and permanent impacts to vegetation may occur if the transmission line is located on the south side of 137th Street NW.

West of St. Augusta a small portion of an MCBS area ranked moderate for significant biodiversity is included in the southwest corner in the route where it changes less than direction. The area included in the route is less than an acre in size and is a part of a larger area that follows a small tributary in the area. The portion of the area within the route is previously disturbed cropland and grassland and impacts would not affect the overall quality of the area.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Refer to Table 5-36 for impacts on Rare and Unique Natural Resources/Critical Habitat.

Table 5-36. Rare and Unique Natural Resources/Critical Habitat – Route B

Route B	Number of MCBS Sites of Biodiversity Significance Crossed within ROW*	ROW MCBS Sites of Biodiversity Significance (acres)*	ROW Percent of MCBS Sites of Biodiversity Significance*	State Listed T&E or Candidate Species within Route**	State Listed T&E or Candidate Species Occurrences within Route**	State Listed T&E or Candidate Species within 1-mile of Route**	State Listed T&E or Candidate Species Occurrences within 1-mile of Route**
Impacts	5	11	1.7%	0	0	11	30

**MnDNR Data Deli*

*** Threatened and Endangered Species were identified using data licensed from the MnDNR for this project.*

Route C

This section focuses on federal and state protected species and rare and unique communities within one mile of Route C. While state non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered. The review of the NHIS database within one mile of the route identified a total of 12 different species. There were no occurrences of federally listed species; one state-listed endangered species, three state-listed threatened species, and eight different species of special concern documented within a one mile area of Route C. No critical habitat occurs within one mile of the route.

Table 5-37. Rare and Unique Resources – Route C

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Acadian flycatcher	*Empidonax virescens*	2	SC	S3
Bald eagle	*Haliaeetus leucocephalus*	3	SC	S3
Cerulean warbler	*Dendroica cerulea*	10	SC	S3
Peregrine falcon	*Falco peregrinus*	1	THR	S2
Trumpeter swan	*Cygnus buccinator*	1	THR	S2
Red-shouldered hawk	*Buteo lineatus*	5	SC	S3
Amphibians				
Blanding's turtle	*Emydoidea blandingii*	10	THR	S2
Invertebrates				
Black sandshell	*Ligumia recta*	3	SC	S3
Creek heelsplitter	*Lasmigona compressa*	1	SC	S3
Plants				
Hill's thistle	*Cirsium hillii*	1	SC	S3
Tubercled rein-orchid	*Plantanthera flava var. herbiola*	4	END	S1
American ginseng	*Panax quinquefolius*	1	SC	S3

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed).*

Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Refer to Table 5-38 for impacts on Rare and Unique Natural Resources/Critical Habitat associates with Route C. Resources and impacts to MCBS areas located west of the Monticello substation are similar to those described for Route B with the exception of the area located in Silver Creek Township. In this location Route C travels further south and intersections the southern portion of the MCBS area ranked high for significant biodiversity on the north side of 127th Street NE. In this location the MCBS area is part of the Harry Larson Memorial County Forest and approximately four acres of the MCBS would be within the proposed ROW.

Table 5-38. Rare and Unique Natural Resources/Critical Habitat – Route C

Route C	Number of MCBS Sites of Biodiversity Significance Crossed within ROW*	ROW MCBS Sites of Biodiversity Significance (acres)*	ROW Percent of MCBS Sites of Biodiversity Significance*	State Listed T&E or Candidate Species within Route**	State Listed T&E or Candidate Species Occurrences within Route**	State Listed T&E or Candidate Species within 1-mile of Route**	State Listed T&E or Candidate Species Occurrences within 1-mile of Route**
Impacts	5	15	2	0	0	23	73

**MnDNR Data Deli*

*** Threatened and Endangered Species were identified using data licensed from the MnDNR for this project.*

Route D

This section focuses on federal and state protected species and rare and unique communities within one mile of Route D. While state non-status species may occur, they are outside the focus of this discussion. Species protected under state statute are those listed as special concern, threatened, and endangered. The review of the NHIS database within one mile of the route identified 15 different species. There were no occurrences of federally listed species; one state-listed endangered species, four state-listed threatened species, and nine different species of special concern, and one species with no legal status are documented within a one mile area of Route D. One critical nesting area occurs within one mile of Route D.

Table 5-39. Rare and Unique Resources – Route D

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Bald eagle	*Haliaeetus leucocephalus*	7	SC	S3
Cerulean warbler	*Dendroica cerulea*	10	SC	S3
Peregrine falcon	*Falco peregrinus*	3	THR	S2
Trumpeter swan	*Cygnus buccinator*	1	THR	S2
Red-shouldered hawk	*Buteo lineatus*	2	SC	S3
Common moorhen	*Gallinula chloropus*	2	SC	S3
Loggerhead shrike	*Lanius ludovicianus*	7	THR	S2
Sandhill crane	*Grus canadensis*	1	NON	S4
Amphibians				
Blanding's turtle	*Emydoidea blandingii*	7	THR	S2
Invertebrates				
Black sandshell	*Ligumia recta*	13	SC	S3
Creek heelsplitter	*Lasmigona compressa*	4	SC	S3
Plants				
Hill's thistle	*Cirsium hillii*	2	SC	S3
Tubercled rein-orchid	*Plantanthera flava var. herbiola*	18	END	S1
Rock sandwort	*Minuartia dawsonensis*	1	SC	S3
Butternut	*Juglans cinerea*	2	SC	S3

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed). NON is a species with no legal status, but about which the Natural Heritage and Nongame Research Program is gathering data because the species falls into one of the following categories: the species is being considered for addition to the state list; the species was removed from the state list but records for the species are still entered and maintained as a precautionary measure or the species has been recently discovered in the state; the species is presumed to be extirpated from the state.*

MCBS areas ranked high for significant biodiversity exist within Route D northeast Monticello where the route travels across the Mississippi River. Impacts to the area are not anticipated because the route follows an existing transmission line in this location.

Southeast of the city of Clear Lake an MCBS area ranked moderate for significant biodiversity is traversed by Route D. Northeast of the city a small area ranked moderate is located along the west side of the route. Impacts to these areas are limited because the route follows an existing transmission line in this location.

In St. Augusta there is an MCBS area ranked moderate for significant biodiversity. The portion within Route D is approximately 16 acres in size and represents the southern tip of the MCBS area which extends northeast to the Mississippi River. The vegetation cover in the area includes oak (*Quercus sp.)* species, upland shrubs, grasslands and croplands. Temporary construction

impacts and permanent impacts to vegetation could occur if the transmission line alignment traveled through the area.

Although specific alignments have not yet been determined, Applicants are requesting a 150 foot ROW; 75 feet on either side of an alignment. Refer to Table 5-40 for impacts on Rare and Unique Natural Resources/Critical Habitat associated with Route D.

Table 5-40. Rare and Unique Natural Resources/Critical Habitat – Route D

Route D	Number of MCBS Sites of Biodiversity Significance Crossed within ROW*	ROW MCBS Sites of Biodiversity Significance (acres)*	ROW Percent of MCBS Sites of Biodiversity Significance*	State Listed T&E or Candidate Species within Route**	State Listed T&E or Candidate Species Occurrences within Route**	State Listed T&E or Candidate Species within 1-mile of Route**	State Listed T&E or Candidate Species Occurrences within 1-mile of Route**
Impacts	7	35	6%	1	1	12	68

**MnDNR Data Deli*

*** Threatened and Endangered Species were identified using data licensed from the MnDNR for this project.*

Quarry Substation Site 1

There are no NHIS occurrences within the Quarry Substation Site 1 or within one mile of the area. No MCBS areas are located at the Quarry Substation Site 1 location.

Quarry Substation Site 2

Applicants have reviewed the NHIS for species occurrences within one mile of the Quarry Substation Site 2. There are no NHIS occurrences within the site; however there are two species of special concern documented within a one mile area of Quarry Substation Site 2. The Applicant would not expect impacts on these species to occur due to lack of appropriate habitat within at the alternate site location. No MCBS areas are located at the Quarry Substation Site 2 location.

Table 5-41. Rare and Unique Resources – Quarry Substation Site 2

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Invertebrates				
Black sandshell	*Ligumia recta*	2	SC	S3
Creek heelsplitter	*Lasmigona compressa*	1	SC	S3

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed).*

Quarry Substation Site 3 and the 115 kV Interconnect

Applicants have reviewed the NHIS for species occurrences within one mile of the Quarry Substation Site 3 and the 115 kV Interconnect. There are no NHIS occurrences within the site; however there is one state-listed endangered species and one state-listed threatened species documented within a one mile area of the Quarry Substation Site 3 and the 115 kV Interconnect Route. The Applicant would not expect impacts on these species to occur due to lack of appropriate habitat within at the alternate site location. No MCBS areas are located at the Quarry Substation Site 3 location.

Table 5-42. Rare and Unique Resources – Quarry Substation Site 3 and the 115 kV Interconnect

Common Name	Scientific Name	Number of Occurrences	MN Status	State Rank*
Birds				
Red-shouldered hawk	*Buteo lineatus*	1	SC	S3
Plants				
Tubercled rein-orchid	*Plantanthera flava var. herbiola*	1	END	S1

**In Minnesota, a rank is assigned to the natural community type, which reflects the known extent and condition of that community. Ranks range from S1 (in greatest need of conservation action in the State) to S5 (secure under present conditions) to SU (undetermined, more information is needed).*

Similar to the Applicant Preferred Route and Route A, the Interconnect Route has the opportunity to collocate with the I-94 corridor as described in Section 1.5. There are two state listed Threatened and Endangered Species within one mile of the proposed ROW for the minimum, maximum, and no interstate occupancy options and only two occurrences of the species within one mile of the ROW . Refer to **Error! Reference source not found.** for impacts on Rare and Unique Natural Resources/Critical Habitat based on ROW.

5.15.3 Mitigation

The special status species associated with wetlands, stream banks, and rivers could be impacted by placement of structures within these habitats, or by increased erosion and sedimentation that could occur if Best Management Practices (BMPs) are not employed. Therefore, the Applicant would work to span rivers, streams, and wetlands throughout the Project area, implement appropriate BMPs, and maintain sound water and soil conservation practices during construction of the Project to protect topsoil and adjacent water resources, minimizing soil erosion and sedimentation. However, if it is not feasible to span, a survey would be conducted to determine the presence of special status species or suitability of habitat for such species, and coordination would occur with the appropriate agencies to avoid and minimize any associated impacts.

No impacts to NHIS species are anticipated as a result of any of the proposed routes, substations or interconnect routes; therefore no mitigation measures are proposed.

As discussed above, MCSB areas of moderate, high, and outstanding biodiversity significance; and MnDNR-listed natural communities are areas known to be capable of supporting rare and unique species. The number of structures placed in these areas would either be avoided or minimized by maximizing the span across them. Where structure placement cannot be avoided in these sensitive communities, special status species associated with these habitats could be affected. Applicants would also span any habitats where unique plant communities have been recorded or are likely to occur, wherever possible. If construction within these resources cannot be avoided, surveys would be conducted and the appropriate agencies would be consulted to assure impacts to listed species are avoided or minimized.

Environmentally sensitive areas and wetland areas may also require special construction techniques in some circumstances. During construction, the most effective way to minimize impacts to wet areas would be to span all streams and rivers. Construction mats are also placed in wet or soft soil locations and narrow ditches to minimize disturbances. These mats can also provide access to sensitive areas during times when the ground is not frozen to minimize impacts at the site. Diagram 5-4 shows an example of construction mats.

Diagram 5-4. Example of Construction Mats

Source: Route Permit Application for the Monticello to St. Cloud 345 kV Transmission Line Project.

Mitigation measures specific to each route are described below.

Applicant Preferred Route

As discussed in previous sections, Applicants have routed the Applicant Preferred Route such that the majority is co-located with existing ROWs, therefore minimizing additional tree clearing that could increase fragmentation of sensitive habitats.

Mitigation measures to avoid impacts to MCBS areas of high significance northwest of Monticello would include locating the transmission line alignment along the outside boundary of the MCBS area and within an existing roadway to the extent feasible or span the MCBS area entirely.

Mitigation measures to avoid impacts to the MCBS area of moderate biodiversity significance southeast of St. Augusta would be to span the MCBS area.

Route A

Where Route A parallels the Applicant Preferred Route northwest of Monticello ROW collocation with I-94 or County highway 75 provides the greatest opportunity to mitigating impacts to the MCBS area. Locating the transmission line alignment as close to the existing I-94 ROW as possible would minimize impacts to the MCBS area and reduce any fragmentation of the area of high biodiversity significance.

Route B

Impacts to the MCBS areas within Route B west of the existing Monticello Substation are not avoidable. If Route B is selected, the applicant would work with the MnDNR to locate the transmission line in an area that disturbs the smallest amount of high biodiversity at this location. Mitigation measure to avoid impacts to the MCBS area along 137th Street NW would be spanning the fraction of the MCBS area that is located on the edge of the proposed ROW.

Route C

Similar to Route B, impacts to the MCBS areas within Route C west of the existing Monticello Substation are not avoidable. Where the proposed Route C ROW is located on the north side of 127th Street NE and impacts to the MCBS (County Forest) are not avoidable, the Applicant would work with the MnDNR to avoid and minimize impacts to any sensitive habitats. Mitigation measure to avoid impacts to the MCBS area along 127th Street NW would be spanning the MCBS area that is located on the roadway to the extent feasible or moving the transmission line alignment to the south side of the roadway.

Route D

Permanent impacts to the MCBS areas will result from vegetation clearing in the 150 foot ROW. When crossing an MCBS site is unavoidable the area will be spanned to the extent feasible to minimize impacts to the site. TheMCBS sites that are crossed by the alignment are impacted along their outer boundaries so there would be no interruption of the total parcel. Although existing habitat is presently fragmented by the 115 kV transmission line, habitat along this route could be further diminished by the need for any additional ROW required for the proposed 345 kV transmission line.

5.16 SURFACE WATER

Surface waters are water resources that provide potable and non-potable water, wildlife habitat, and recreational opportunities such as swimming, boating, canoeing, and hiking. Section 401 of the Clean Water Act of 1977 (CWA) grants state agencies the authority to require certification of compliance with state and federal water quality regulations. In Minnesota, the Minnesota Pollution Control Agency (MPCA) implements Section 401 and would grant Project certification. The MPCA also administers the National Pollutant Discharge Elimination System (NPDES) permit program. This program regulates the discharge of stormwater from construction sites among other surface water discharges.

Some rivers, streams, and wetlands are designated Public Waters by the State of Minnesota and are under the regulatory jurisdiction of the MnDNR. These are listed in the Public Waters Inventory (PWI). The statutory definition of public waters can be found in Minn. Stat. §103G.005, subdivisions 15 and 15a. These waters are afforded special protection by the state and require a public waters work permit or license to cross public waters from the MnDNR to address construction impacts.

This section discusses the surface waters that may be impacted by the proposed project and the mitigative measures that could be implemented to minimize impacts.

5.16.1 Affected Environment

The Project area is found in Central Minnesota, an area covered with many ponds, lakes, streams, and rivers. The Project area also lies within the Upper Mississippi River Basin and spans the Sauk River and Mississippi River- St. Cloud watersheds. The largest river in the Project area is the Mississippi River. Route D is the only route which crosses the Mississippi River. The other routes roughly parallel the Mississippi River at a distance great enough that the transmission lines would not be visible from the Mississippi River, with the exception of near Monticello. The details of waterbody crossings are listed in tables for each route described below. The following information outlines the state and federal requirements with respect to regulating impacts to surface water when constructing and operating transmission line projects.

Section 404 of the CWA regulates activities that result in discharge of dredged, fill, or excavated material into Waters of the United States. The lateral limits of jurisdiction in those waters may be divided into three categories. The categories include the territorial seas, tidal waters, and non-tidal waters.

Section 303(d) of the federal CWA requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants; these are also referred to as impaired waters. The list, known as the 303(d) list, is based on violations of water quality standards. In Minnesota, the MPCA has jurisdiction over determining 303(d) waters. The only waterbody on this list that is crossed by the Project includes the Clearwater River, which is listed as having affected aquatic life due to low levels of dissolved oxygen.

5.16.2 Potential Impacts

Because all rivers, streams, and ditches would be spanned by transmission structures or avoided (if possible), a limited number of structures would be located within these features and impacts on rivers, streams, or ditches would be minimized. Indirect impacts could include sedimentation reaching surface waters during construction due to ground disturbance by excavation, grading, construction traffic, and dewatering of holes drilled for transmission structures. This could temporarily degrade water quality due to turbidity.

Applicant Preferred Route

Numerous surface water resources including lakes, rivers, streams, and wetlands are located along the Proposed Routes (see Appendix H).Major named surface waters within the Applicant Preferred Route include Warner, Locke, and Fish lakes and the Clearwater River. The largest surface water body along this route is Locke Lake. In order to avoid impacts associated with the crossing of Locke Lake, the Applicant Preferred Route parallels the north side of Interstate 94 (I-94). All of the major surface waters listed here are MnDNR protected waters.

Several small or unnamed streams also occur along the Applicant Preferred Route. Water features crossed by the Applicant Preferred Route are summarized in Table 5-43. Waterbodies listed in the PWI are denoted in this table.

Table 5-43. Waterbodies Crossed by the Applicant Preferred Route

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Stream (perennial) to Rice Lake	1	No
Stream (perennial) from Fish Lake to Mississippi River	1	No
Clearwater River	1	Yes
Plum Creek	1	Yes
Johnson Creek	1	Yes
Robinson Hill Creek	2	Yes
Drainage Ditch to Mud Lake	2	No
County Ditch 17	1	Yes
Drainage Ditch to County Ditch 17	1	No
Unnamed Stream to County Ditch 17	1	No

Determined by HDR Inc. based on 150 foot ROW for all options

Route A

Major named surface waters within Route A include Warner, Fuller, and Locke lakes and the Clearwater River. The largest surface water body along this route is Locke Lake. As with the Applicant Preferred Route, to avoid impacts associated with the crossing of Locke Lake, Applicant Route A parallels the north side of I-94. All of the major surface waters listed here are MnDNR protected waters.

Several small or unnamed streams also occur along the Alternate Route A. The surface water resources crossed by Route A are listed below and identified on the detailed route maps in Appendix H.

Table 5-44. Waterbodies Crossed by Alternate Route A

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Stream (perennial) to Rice Lake	1	No
Stream (perennial) from Fish Lake to Mississippi River	1	No
Clearwater River	1	Yes
Plum Creek	1	Yes
Stream (intermittent) to Johnson Creek	1	No
Johnson Creek	3	Yes
Robinson Hill Creek	2	Yes
Stream (intermittent) to Robinson Hill Creek	1	No
County Ditch 17	1	Yes
Stream (intermittent) to County Ditch 17	1	No

Determined by HDR Inc. based on 150 foot ROW for all options

Route B

Major named surface waters within Route B Route include the Clearwater River. The Clearwater River is a MnDNR protected water.

Several small or unnamed streams also occur along the Alternate Route A. The surface water resources crossed by Route B are listed below and identified on the detailed route maps in Appendix H.

Table 5-45. Waterbodies Crossed by Route B

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Stream (perennial) to Fish Lake	1	No
Clearwater River	1	Yes
Plum Creek	1	Yes
Stream (intermittent) to Johnson Creek	1	No
Johnson Creek	3	Yes
Robinson Hill Creek	2	Yes
Stream (intermittent) to Robinson Hill Creek	1	No
County Ditch 17	1	Yes
Stream (intermittent) to County Ditch 17	1	No

Determined by HDR Inc. based on 150 foot ROW for all options

Route C

Ember and North lakes and the Clearwater River are the major named surface waters within Route C. All of the major surface waters listed here are MnDNR protected waters.

Several small or unnamed streams also occur along Route C. The surface water resources crossed by Route C are listed below and identified on the detailed route maps in Appendix H. (that shows detailed route maps).

Table 5-46. Waterbodies Crossed by Route C

Waterbody Name	Number of Crossings	PWI Stream
Silver Creek	1	Yes
Stream (perennial) to Fish Lake	1	No
Clearwater River	1	Yes
Plum Creek	1	Yes
Stream (intermittent) to Johnson Creek	1	No
Johnson Creek	3	Yes
Robinson Hill Creek	2	Yes
Stream (intermittent) to Robinson Hill Creek	1	No
County Ditch 17	1	Yes
Stream (intermittent) to County Ditch 17	1	No

Determined by HDR Inc. based on 150 foot ROW

Route D

Major named surface waters within Route D include the Mississippi River. The Mississippi River is a MnDNR protected water.

Several small or unnamed streams also occur along Route D. The surface water resources crossed by Route D are listed below and identified on the detailed route maps in Appendix H. (that shows detailed route maps).

Table 5-47. Waterbodies Crossed by Route D

Waterbody Name	Number of Crossings	PWI Stream
Mississippi River	3	Yes
Johnson Creek	1	Yes
Robinson Hill Creek	2	Yes
Drainage Ditch to Mud Lake	2	No
County Ditch 17	1	Yes
Drainage Ditch to County Ditch 17	1	No
Unnamed Stream to County Ditch 17	1	No

Determined by HDR Inc. based on 150 foot ROW for all options

Quarry Substation Site 1

There are no waterbodies located in the Quarry Substation 1 area. Therefore impacts to waterbodies are not anticipated and mitigation would not be needed.

Quarry Substation Site 2

There are no major named surface waters within the Quarry Substation Site 2.

Several small or unnamed streams occur along within the Quarry Substation Site 2. The surface water resources within the Quarry Substation Site 2 are listed below and identified on the detailed route maps in Appendix H.

Table 5-48. Waterbodies Crossed by Quarry Substation Site 2

Waterbody Name	Number of Crossings	PWI Stream
Stream (Intermittent) to County Ditch 17	1	No
County Ditch 17	1	Yes

Determined by HDR Inc. based on 150 foot ROW

Quarry Substation Site 3 and the 115 kV Interconnect

There are no major named surface waters within the Quarry Substation Site 3 and the 115 kV Interconnect.

A small unnamed stream occurs within the Quarry Substation Site 3 Area. The surface water resources within the Substation are listed below and identified on the detailed route maps in Appendix H.

Table 5-49. Waterbodies Crossed by Quarry Substation Site 3 and the 115Kv Interconnect

Route/Site Name	Waterbody Name	Number of Crossings	PWI Stream
Quarry Substation Site 3 and 115kV Interconnect	Drainage Ditch to County Ditch 17	1	No
	Drainage Ditch	2	No
	County Ditch 17	1	Yes

Determined by HDR Inc. based on 150 foot ROW for all options

5.16.3 Mitigation

The mitigation for the Applicant Preferred Route, Route A, Route B, Route C, Route D, Quarry Substation Sites 1 and 2 and the Quarry Substation Site 3 and the 115 kV interconnect would be the same.

Impacts would be avoided and minimized using appropriate sediment control practices and construction practices. These practices would be detailed in the National Pollutant Discharge Elimination System (NPDES) permit and Stormwater Pollution Prevention Plan (SWPPP) that would be completed prior to the start of construction. In addition, Minn. Stat. §84.415 requires the Applicant to obtain a license from the MnDNR for passage of any utility over, under, or

across public waters. Other permits potentially needed include a Section 404 Regional General Permit from the USACE and Section 401 CWA, Water Quality Certification.

Waterways would not be crossed by construction equipment unless necessary and the appropriate local, state, and or federal agencies would be consulted. Where waterways must be crossed to string new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices would help to prevent soil erosion. The Applicant is proposing to replace disturbed soil and restore to previous conditions, or better, and the amount of land converted to an impervious surface would be small. Therefore, there would be no significant impacts on surface water quality.

5.17 WETLANDS

Wetlands perform many important hydrologic functions, such as maintaining stream flows, slowing and storing floodwaters, stabilizing stream banks, nutrient removal and uptake, and groundwater recharge. This section discusses the wetlands that may be impacted by the proposed project and the mitigative measures that would be implemented to minimize impacts

5.17.1 Affected Environment

Wetlands are present at several points along the various route and substation alternatives being analyzed for the Project. Wetlands are important resources for flood abatement, wildlife habitat, and water quality. In the State of Minnesota, wetlands are regulated under the Wetland Conservation Act (WCA) and therefore require coordination with the Minnesota Board of Water and Soil Resources (BWSR) and Section 404 of the CWA by the USACE. PWI wetlands are also regulated by the DNR.

The USFWS National Wetlands Inventory (NWI) was used to identify wetlands throughout the various route and substation alternatives analyzed for this Project. Starting in the 1970s, the USFWS produced maps of wetlands (NWIs) based on aerial photographs and Natural Resources Conservation Service soil survey maps. Because land use has changed since the 1970s, wetlands shown on the NWI maps are sometimes inconsistent with current wetland conditions; however, NWIs are the most accurate and readily available database of wetland resources within the proposed Project area.

For jurisdictional purposes, the USACE and the State of Minnesota jointly define wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.

A number of wetland classification systems have been developed, but the Cowardin et al. (1979) and the Circular 39 (Shaw and Fredine 1956) classification methods are the most widely recognized systems and have been used for wetland classification within the regional area. Please see Appendix C for further detail on these classification systems.

Temporary and permanent wetland impacts that would occur due to construction and operation of the Project were determined using the NWI to estimate the acres of wetland located within 1,000-foot route widths and the acreage for each of the substation sites.

Temporary impacts on wetlands may occur if they need to be crossed during construction of the transmission line. Permanent impacts on wetlands would take place where structures must be located within wetland boundaries. Wetland impacts due to permanent structure placement would result in approximately 55 square feet of permanent impacts per standard single-pole structure. Temporary impacts would total one acre per span of transmission line. Table 5-50 below identifies the wetlands crossed by the transmission line and existing wetlands in the area of the propsed substations.

Table 5-50. Wetlands Crossed by the Route

Route	Total NWI Acres in Route	NWI Forested Acres in Route	Total PWI Acres in Route
Applicant Preferred	571	30	173
Route A	545	16.5	180
Route B	602	21	130
Route C	589	21	157
Route D	428	20	113
115 kV Interconnect	126	0.1	5

Determined by HDR Inc. based on 1000 foot Route

5.17.2 Potential Impacts

A 150-foot-wide ROW was used to calculate temporary and permanent impacts for each of the five alignments and the two interconnect transmission lines. The Applicant is proposing to parallel the I-94 corridor for significant segments of the Applicant Preferred Route, Applicant Route A, Route D and the Substation Interconnect A. To address the potential for conflicts with occupancy of I-94 right of way, the Applicant specifically identified three alignment options for these routes; the Maximum ROW Occupancy (alignment centerline generally 5 feet outside the edge of I-94 right of way), the Minimum ROW Occupancy (alignment centerline generally 25 feet outside the edge of I-94 right of way) and the No ROW Occupancy (alignment centerline generally 75 feet outside the edge of I-94 right of way).

Table 5-51 provides a qualitative assessment of the type of impacts that could occur with these three alignments.

Table 5-51. Summary of Wetlands Crossed by 150-foot ROW

Alignment		Wetlands[1] NWI							Streams, Lakes, and PWI[4]		
		Total Wetlands Within the ROW (Acres)	Number of Wetlands the ROW Crosses	Forested Wetlands in ROW (Acres)	Number of Forested Wetlands ROW Crosses	Number of Poles in Wetlands[2]	Permanent Wetland Impacts (Acres)[2]	Temporary Wetland Impacts (Acres)[3]	Number of PWI Wetlands within ROW	Number of Poles in PWI Wetlands by Alignment	Permanent Wetland Impacts (Acres)[2]
Applicant Preferred Route	Maximum ROW Occupancy	59	56	2	4	28	.03	8.3	7	6	0.007
	Minimum ROW Occupancy	65	58	3	4	30	.04	8.7	7	6	0.007
	No ROW Occupancy	72	60	5	4	30	.04	9.1	7	6	0.007
Route A	Maximum ROW Occupancy	47	67	3	2	19	.02	5.8	6	6	0.007
	Minimum ROW Occupancy	47	67	3	2	20	.02	5.9	6	6	0.007
	No ROW Occupancy	46	68	3	2	18	.02	5.7	6	5	0.006
Route B		57	82	3	3	24	.03	7.3	3	1	0.001
Route C		50	76	3	4	18	.02	6.3	5	2	0.002
Route D		35	32	1	2	11	.01	4.0	3	3	0.003
115 kV Interconnect	Maximum ROW Occupancy	21	11	0	0	8	0.01	2.6	2	2	0.002
	Minimum ROW Occupancy	59	56	2	4	28	.03	8.3	7	6	0.002
	No ROW Occupancy	65	58	3	4	30	.04	8.7	7	6	0.002

[1] Wetland numbers were calculated using the NWI maps. These values represent an estimate of the number of wetlands likely present along the route. These values do not necessarily represent the number of wetland impacts subject to state and federal delineation of wetlands.

[2] The number of poles was determined by preliminary pole spotting conducted by Applicants and the identification of wetlands was determined using NWI wetland data for the Applicant Preferred Route, Route A and B. For Routes C, D and the 115 kV Interconnect the number of poles was calculated by taking the length of the wetland crossing and divided it by an 800 foot span. The final number of poles in wetlands is dependant on final design and engineering and field delineation of wetlands. Permanent Impacts were calculated using 55 square feet per pole

[3] Temporary impacts were calculated by identifying the acreage of wetlands that are within 10 feet of each side of the alignment (20 feet total width). The 20 feet in width is the assumed width of a temporary access road. This estimate is worst-case based as the entire length of the wetland would not likely need to be traversed during construction

[4] Stream crossings were compiled using the MnDNR 24K streams dataset. Lakes were identified using the MnDNR 24K lakes dataset. PWI streams, waters, and wetlands were identified in the MnDNR datasets. PWI waters were identified using the MnDNR PWI dataset.

Applicant Preferred Route

Table 5-51 above, includes a summary of wetlands crossed by the Applicant Preferred Route. The most common wetland type crossed by this route is palustrine emergent wetlands. See Appendix C for a description of each wetland type, representing primarily palustrine ecological systems.

The Applicants have also analyzed the three ROW occupancy options and have identified that there are fewer poles in wetlands and fewer impacts to wetlands under the Maximum Interstate Occupancy Alignment option. The number of poles in PWI wetlands and the number of PWI wetlands within the three occupancy options is the same. Appendix H illustrates the wetland locations within the Route.

Route A

Table 5-51 above, includes a summary of wetlands crossed by Route A. The most common wetland type crossed by this route is palustrine emergent wetlands. See Appendix C for a description of each wetland type, representing primarily palustrine ecological systems.

The Applicants have also analyzed the three ROW occupancy options and have identified that there are fewer poles in wetlands and fewer impacts to wetlands under the No Interstate Occupancy Alignment option. There is one fewer pole in the no ROW occupancy option and there are the same number of wetlands in all three options. Appendix H illustrates the wetland locations within the Route.

Route B

Table 5-51 above, includes a summary of wetlands crossed by Route B within a 150 foot ROW. The most common wetland type crossed by Route B are palustrine emergent wetlands. See Appendix C for a description of each wetland type, representing primarily palustrine ecological systems. Route B has similar impacts to wetlands as the other routes analyzed. Appendix H illustrates the wetland locations within the Route.

Route C

Table 5-51 above, includes a summary of wetlands crossed by Route C within a 150 foot ROW. The most common wetland type crossed by Route C are palustrine emergent wetlands. See Appendix Y for a description of each wetland type, representing primarily palustrine ecological systems. Route C has similar impacts to wetlands as the other routes analyzed. Appendix H illustrates the wetland locations within the Route.

Route D

Table 5-51 above, includes a summary of wetlands crossed by Route D. The most common wetland type crossed by this route is palustrine emergent wetlands. See Appendix Y for a description of each wetland type, representing primarily palustrine ecological systems. Appendix H illustrates the wetland locations within the ROW. Appendix H illustrates the wetland locations within the Route.

Quarry Substation Site 1

The area analyzed for Quarry Substation Site 1 covers 89.6 acres. While the final engineering and design have not been determined, the final constructed fenced area of the substation would be approximately 15 acres within the 89.6 acre site.

The most common wetland type existing in the Quarry Substation Site 1 area is palustrine emergent wetlands. Appendix H illustrates the wetland locations within the substation site area.

Quarry Substation Site 2

The area analyzed Quarry Substation Site 2 covers 296.7 acres. Final engineering and design has not been determined. However, the final constructed fenced area of the substation would be approximately 15 acres within the 296.7 acre site analyzed.

The most common wetland type existing is palustrine emergent wetlands. Appendix H illustrates the wetland locations within the substation site area.

Quarry Substation Site 3

The area analyzed for the Quarry Substation 3 substation covers 15 acres. Final engineering and design has not been determined. However, the final constructed fenced area of the substation would be approximately 15 acres.

The most common wetland type existing is palustrine emergent wetlands. Appendix H illustrates the wetland locations within the substation site area.

5.17.3 Mitigation

A wetland permit is required from the United States Army Corps of Engineers (USACE) under Section 404, and a license to cross PWI wetlands is required from the MnDNR. Other permits potentially needed include a Section 401 CWA, Water Quality Certification. This Project may not require a permit under WCA by definition (Minn. R. 8420.0110 Subpart 18) or by exemption (R. 8420.0122 Subpart 6). Coordination with affected local government units or the BWSR is required for the WCA determination.

If impacts to wetlands occur, they would be minimized through construction practices that would be conditions of required water resource and route permits. Construction crews would likely be required to maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored soil. Crews would likely be required to avoid major disturbance of individual wetlands and drainage systems during construction. This could be accomplished by strategically locating new access roads and spanning wetlands and drainage systems where possible. When it is not feasible to span the wetland, construction crews can consider several options during construction to minimize impacts such as:

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

- Erosion control devices (e.g., silt fence, straw bales) could be installed to ensure that sediment does not enter the water feature.
- Wetland vegetation could be restored following construction.

No staging or stringing setup areas would be placed within or adjacent to water resources, to the extent feasible. Applicants would avoid major disturbance of individual wetlands and drainage systems during construction to the extent feasible. This would be done by spanning wetlands and drainage systems, where possible. When it is not possible to span the wetland, Applicants would draw on several options during construction to minimize impacts.

Access roadways would be designed to minimize wetland impacts by locating the areas of roadways near the edges of wetland areas, minimizing the width of the access roadways and construction material (gravel) where possible. The Applicant would be required to obtain necessary permits or approvals. Vegetation maintenance procedures under transmission lines prohibit trees from establishing. Existing trees must be removed throughout the entire ROW, including forested wetlands. Wetland mitigation for conversion of forested wetlands to non-forested wetlands may be required as a condition of applicable wetland permits which may include WCA approvals, MnDNR public waters work permits, and USACE Section 404 permits.

5.18 FLOODPLAINS

Floodplains are the low, flat, periodically flooded lands adjacent to rivers, lakes and oceans and subject to geomorphic (land-shaping) and hydrologic (water flow) processes. Floodplains are regulated at both the state and federal levels to promote and ensure sound land use development in floodplain areas. This section identifies the floodplains that may be impacted by the project and mitigative measures that may be implemented if necessary. Quarry Substation Sites 1, 2, and 3 as well as the 115 kV Interconnect do not impact any floodplains.

5.18.1 Affected Environment

Federal Emergency Management Agency (FEMA) collected data and has mapped floodplains nationwide. FEMA maps were reviewed to determine the presence of floodplains within the Project Area. This search indicated that there are several floodplains areas located within the site. The Clearwater and Mississippi Rivers travel through the Proposed Project Area. The Clearwater and Mississippi Rivers have floodplain zones which are classified as 100-year and 500-year elevations within the Project Area (Figure 5-1). Floodplain areas found in the Proposed Project Area are summarized in Table 13. FEMA defines a 100-year flood zone as the following: "A 100-year flood is the flood elevation that has a one percent chance of being equaled or exceeded each year. The 100-year flood is that standard used by most Federal and state agencies and is used by the National Flood Insurance Program (NFIP) as the standard for floodplain management and determination of flood insurance" (FEMA FAQ documents). Following a similar classification or definition, a 500-year flood is the flood elevation that has 0.2 percent chance of being equaled or exceeded each year.

FEMA designates areas that are likely to experience flooding in a 100-year and 500-year rainfall event. While transmission structures can withstand some inundation, function and maintenance of the transmission structures could be affected within the floodplain during a flood event.

The acreages of floodplains crossed by the Project routes and substations are listed below in Table 5-52.

Table 5-52. Floodplains within the 1000-foot Route

Route	Floodplain	Acres
Applicant Preferred Route	100-Year	27.6
Route A	100-Year	10.7
Route B	100-Year	7.8
Route C	100-Year	0.5
Route D	100-Year	9.7
Substation	**Floodplain**	**Acres**
Quarry Substation Site 1	100-Year	0
Quarry Substation Site 2	100-Year	0
Quarry Substation Site 3 and the 115 kV Interconnect	100-Year	0

5.18.2 Potential Impacts

A 150 foot wide ROW was used to calculate the acres of floodplains within the ROW for each of the five alignments and the two interconnect transmission lines. The Applicant is proposing to parallel the I-94 corridor for significant segments of the Applicant Preferred Route, Route A, Route D and the Quarry Substation Interconnect A. To address the potential for conflicts with occupancy of I-94 right of way, the Applicant specifically identified three alignment options for these routes; the Maximum ROW Occupancy (alignment centerline generally 5 feet outside the edge of I-94 right of way), the Minimum ROW Occupancy (alignment centerline generally 25 feet outside the edge of I-94 ROW) and the No ROW Occupancy (alignment centerline generally 75 feet outside the edge of I-94 ROW).

Table 5-53 provides a qualitative assessment of the type of impacts that could occur when a final alignment has been selected.

Table 5-53. Floodplain Data

Alignment		ROW 100-year Floodplain (Acres)	Number of Poles in Floodplain by Alignment
Preferred Route	Maximum Interstate Route Sharing	8	4
	Minimum Interstate Route Sharing	8	3
	No Interstate Route Sharing	8	3
Alternate Route A	Maximum Interstate Route Sharing	1	0
	Minimum Interstate Route Sharing	1	0
	No Interstate Route Sharing	1	0
Alternate Route B		1	0
Route C		1	0
Route D		10	3

Applicant Preferred Route

Table 5-53 above, includes a summary of the 100 year floodplain crossed by the Applicant Preferred Route and identifies that all three of the ROW occupancy options have the same amount of 100 year floodplain within their alignments. The minimum and no occupancy ROW options would have one fewer pole than the maximum ROW occupancy option. The floodplains are shown on the route maps in Appendix H.

Route A

Table 5-53 above, includes a summary of the 100 year floodplain crossed by Route A and identifies that all three of the ROW occupancy options have the same amount of 100 year floodplain within their alignments. There would be no poles placed in any of the ROW occupancy alignment options. The floodplains are shown on the route maps in Appendix H.

Route B

Table 5-57 above, includes a summary of the 100 year floodplain crossed by Route B. There would be no poles placed in this alignment. The floodplains are shown on the route maps in Appendix H.

Route C

Table 5-53 above, includes a summary of the 100 year floodplain crossed by Route C. There would be no poles placed in this alignment. The floodplains are shown on the route maps in Appendix H.

Route D

Table 5-53 above, includes a summary of the 100 year floodplain crossed by Route D. There would be three poles placed in this alignment. The floodplains are shown on the route maps in Appendix H.

Mitigation

Impacts within FEMA floodplains are expected to be minimal and therefore no mitigation measures are anticipated.

5.19 FLORA

Flora consists of the plants in the project region that make up vegetation communities and native vegetation. This section presents the historic and present-day flora as well as noxious weeds and discusses potential impacts on flora.

5.19.1 Affected Environment

The Minnesota Department of Natural Resources and the U.S. Forest Service have developed an Ecological Classification System (ECS) for ecological mapping and landscape classification in Minnesota. The Project area is located within the ECS unit defined as the Eastern Broadleaf Forest. Within this ECS unit, the Project occurs within three subsections: Big Woods, Hardwood Hills, and Anoka Sand Plain.

The Big Woods and Hardwood Hills subsections contain fragmented and limited contiguous segments of wooded and forest tracks. Undisturbed wooded or forested areas are rare. Several wooded and forested land cover areas within the regional area include dry, mesic, and wet forests. These forest community types vary depending on the hydric characteristics of the soil. Dry forests are dominated by white, black, and pin oaks; bitternut hickory; and red maple. Mesic stands would be comprised of red, white, or bur oaks; sugar maple; basswood; green ash; bitternut hickory; big tooth aspen; and butternut. Wet forest areas are typically associated with larger river systems and occur on floodplains. Dominant species consist of green ash, slippery red rock elms, silver maples, cottonwood, black willow, American elm, and bur oak. Black ash, American hornbeam, ironwood, boxelder, hackberry, and basswood are subdominant species.

The State of Minnesota follows the National Hierarchical Framework of Ecological Units for developing an ECS for ecological mapping and landscape classification. The state is divided into four ecological provinces, ten sections and 26 subsections. Provinces are defined units of land using major climate zones, native vegetation, and biomes such as prairies, deciduous forests, or boreal forests. Sections are units within provinces defined by origin of glacial deposits, regional elevation, distribution of plants, and regional climate. The Proposed Routes traverse the Minnesota and northeastern Iowa Morainal Section. Subsections are units within sections defined using glacial deposition processes, surface bedrock formations, local climate, topographic relief, and the distribution of plants, especially trees.

The Project area occurs within one ECS unit, as described by the MnDNR and USFWS: the Eastern Broadleaf Forest. Within this ECS unit, the Project occurs within three subsections: Big Woods, Hardwood Hills, and Anoka Sand Plain. Woodlands and forests dominated sites where fire was uncommon, including species such as sugar maple (*Acer saccarum*), basswood, American elm (*Ulmus americana*), and northern red oak (*Quercus rubra*). Silver maple (*Acer saccarinium*) forests still occupy the active floodplains, while silver maple, cottonwood (*Populus deltoides*), box-elder (*Acer negundo*), green ash (*Fraxinus pensylvanica*), and slippery elm (*Ulmus rubra*) grow near rivers where flooding is infrequent. Wet depressions create conditions suitable for marshes, wet meadows, shrub/scrub wetlands, and wet prairies. As a result of settlement and farming in the 1800s, most of the historic prairie has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays*) and soybeans (*Glycine max*); in the grazed areas, dominant vegetation includes introduced grasses, such as smooth brome (*Bromus inermis*) and

sorghum (*Sorghum vulgare*). Similarly, woodland trees were removed and land was converted to agriculture.

Historically the Big Woods subsection was a forested region dominated by a sugar maple/basswood forest whereas presently the majority of the region is agricultural farms. Presettlement vegetation in the Big Woods Subsection forest consisted of American elm (Ulmus Americana), basswood (*Tilia americana*), sugar maple (*Quercus Saccharum*), bur oak (*Quercus Macrocarpa*), ironwood (*Ostrya virginiana*), northern red oak (*Quercus Rubra*), and aspen (*Populus*).

The Hardwood Hills subsection is located further north of the Big Woods along the Mississippi River. Historically maple-basswood forests interspersed with oak savannas, tallgrass prairies, and oak forests dominated the subsection. Like the Big Woods, presently most of the land is farmed. Presettlement vegetation included mixed forests of oaks (*Quercus sp.*), sugar maple (*Quercus Saccharum*), basswood (*Tilia americana*), and other hardwoods located in the eastern portion of the subsection.

Presettlement vegetation in the Anoka Sand Plain Subsection was oak barrens and openings with upland prairie and floodplain forests along the Mississippi River. The area directly adjacent to the river includes mixed forests of oaks (Quercus sp.) but the predominant land use throughout the subsection is agricultural with croplands.

Throughout the general Project area, there are several areas where native vegetation occurs naturally or is managed. Designated habitat or conservation areas include managed lands such as WMAs, SNAs, NWRs, WPAs, USFWS easements, and unmanaged areas including MnDNR designated MCBS areas of biodiversity significance and rare native habitats and communities. Refer to Sections 5.9, 5.11, and 5.15 for a discussion of impacts and mitigation associated with each of the resources. All of these resources provide habitat for native vegetation, wildlife, and rare and unique resources.

Noxious weeds are regulated under Minn. Stat. §18. Noxious weeds can rapidly overtake native vegetation and severely degrade habitat quality. Cropland suffers losses in productivity following noxious weed infestations. Noxious weeds can be introduced to new areas through propagating material like roots or seeds transported by contaminated construction equipment. Disturbed soil surfaces allow noxious weeds to establish and out-compete existing vegetation. Eleven species of primary noxious weeds are recognized and prohibited by Minn. R. 1505.0730 (see Table 5-54). The Minnesota Noxious Weed Law also defines and lists 49 secondary noxious weeds. A county may select a weed or weeds from this secondary list to be placed on its noxious weeds list. If a secondary noxious weed is placed on a county noxious weed list, that weed must be controlled in that county. The Applicant would work with the state and counties crossed by the alternatives to identify locations along the Project route where invasive species may occur.

Table 5-54. Minnesota Prohibited Noxious Weeds

Common Name	Scientific Name
Mustard, garlic	*Alliaria petiolata* (*Bieb.*) (formerly *alliaria officinalis*)
Hemp	*Cannabis sativa*
Plumeless Thistle	*Carduus acanthoides* (*L.*)
Musk Thistle	*Carduus nutans* (*L.*)
Canada Thistle	*Cirsium arvense* (*L.*) *Scop.*
Bull Thistle	*Cirsium vulgare* (*Savi*) *Tenore*
Field Bindweed	*Convolvulus arvensis*
Purple Loosestrife	*Euphorbia esula* (*L.*)
Perennial Sowthistle	*Lythrum salicaria, vurgatum*, or any combination
Poison Ivy	*Toxicodendron radicans* (*Ktze.*) (formerly *Rhus radicans*)

5.19.2 Potential Impacts

Flora throughout most of the Project area is typical of that normally found in an agricultural setting. The majority of the alternative routes would follow existing ROWs; including roads, transmission lines and would occur adjacent to cultivated row crops. Impacts on native vegetation are not anticipated to substantially disrupt vegetative community quality or function. Applicants would span areas containing native communities wherever possible. Applicants would also work to avoid and minimize direct impacts on habitat and conservation areas as possible. Temporary construction impacts on flora would take place most intensively at the structure locations where borings would take place and spoils would be stored. Permanent impacts are estimated at 55 square feet per pole. Temporary impacts are estimated at one acre per span. Staging areas and stringing areas would also temporarily impact flora across the route. Grading could occur at the staging areas if they are not located in previously disturbed sites. In forested areas, clearing for access roads and staging areas would be limited to only those trees necessary to permit the passage of equipment. Temporary access roads would be removed and the area restored to its original condition.

Permanent vegetative impacts would take place in woodland areas within the Project ROW. Trees and shrubs that may interfere with maintenance and the safe operation of the transmission line would not be allowed to establish within ROW.

Applicant Preferred Route

Flora throughout most of the Applicant Preferred Route is typical of that normally found in an agricultural setting. The Applicant Preferred Route occurs within the same ECS unit and subsections: Big Woods, Hardwood Hills, and the Anoka Sandplain. There are no sections of the Applicant Preferred Route which cross WMAs or NWRs. No habitat would be removed from SNAs, WPAs or USFWS easements. A total of six MCBS sites of biodiversity significance would be crossed by the route.

Route A

Flora throughout most of Route A is typical of that normally found in an agricultural setting. Route A occurs within the same ECS unit and subsections as the Applicant Preferred Route. Similar to the Applicant Preferred Route, there are no sections of Route A which cross WMAs or NWRs. No habitat would be removed from SNAs, WPAs or USFWS easements. A total of six MCBS sites of biodiversity significance would be crossed by the route. See Section 5.15 for a complete discussion of MCBS resources, impacts, and mitigation.

Route B

Flora throughout most of Route B is typical of that normally found in an agricultural setting. Route B occurs within the same ECS unit and subsections as the Preferred and Route A: Big Woods, Hardwood Hills, and the Anoka Sandplain.

Route B does not cross any NWRs, however, it does include a small section of Hoglund WMA in Wright County. No habitat would be removed from SNAs, WPAs or USFWS easements. A total of six MCBS sites of biodiversity significance would be crossed by the route. See Section 5.15 for a complete discussion of MCBS resources, impacts, and mitigation.

Route C

The affected environment, impacts to flora, and mitigation measures associated with Route C are the same as those described for Route B. A total of six MCBS sites of biodiversity significance would be crossed by the route. See Section 5.15 for a complete discussion of MCBS resources, impacts, and mitigation.

Route D

Flora throughout most of Route D is typical of that normally found in an agricultural setting. Route D occurs within the same ECS unit and subsections as the other alignments but predominantly travels through the Anoka Sandplain where it is located east of the Mississippi River. There are no sections of the route which cross WMAs or NWRs. No habitat would be removed from SNAs, WPAs or USFWS easements. A total of eight MCBS Sites of Biodiversity Significance would be crossed by Route D. See Section 5.15 for a complete discussion of MCBS resources, impacts, and mitigation.

Quarry Substation Site 1

The land use within the Proposed Quarry Substation Site 1 area is generally agricultural, therefore the flora at these locations are not likely to be very diverse. Quarry Substation Site 1 does not include WMAs or NWRs. No habitat would be removed from SNAs, WPAs or USFWS easements for Quarry Substation Site 1. No MCBS sites of biodiversity significance would be included in the site. Although NWI wetlands occur within both Quarry Substation site locations, it appears from a review of recent aerial photography that they have both been previously disturbed by agricultural activities or actively cultivated. No MCBS sites of biodiversity significance would be included in the site.

Quarry Substation Site 2

The land use within the Proposed Quarry Substation Site 2 area is generally agricultural, therefore the flora at these locations are not likely to be very diverse. Quarry Substation Site 2 does not include WMAs or NWRs. No habitat would be removed from SNAs, WPAs or USFWS easements for Quarry Substation Site 2. No MCBS sites of biodiversity significance would be included in the site. Although NWI wetlands occur within both Quarry Substation site locations, it appears from a review of recent aerial photography that they have both been previously disturbed by agricultural activities or actively cultivated. No MCBS sites of biodiversity significance would be included in the site.

Quarry Substation Site 3 and 115 kV Interconnect

The land use within the Quarry Substation Site 3 area and the 115 kV Interconnect is generally agriculutre, therefore the flora at these locations are not likely to be very diverse. The Quarry Substation Site 3 does not include WMAs or NWRs. No habitat would be removed from SNAs, WPAs or USFWS easements for the Quarry Substation Site 3. No MCBS sites of biodiversity significance would be included in the site.

5.19.3 Mitigation

Co-locating with existing routes through wooded areas would reduce the impact on trees and habitats they support. Typically, vegetation is controlled mechanically or with herbicides on a regular maintenance schedule. Vegetation that does not interfere with the safe operation of the transmission line is allowed to reestablish within the ROW after construction.

Applicants intend to continue working with the MnDNR and USFWS to avoid or minimize impacts on sensitive flora or on any areas known to contain native vegetation along the route wherever feasible. The transmission line alignment and structure locations will be determined in final design and mitigation measures may include spanning sensitive flora or vegetation.

The disturbance necessary for construction may cause a reduction of habitat within the ROW for some wildlife. The effect diminishes after construction as vegetation reestablishes. If the ROW is then managed for maximum vegetation cover, there should not be a significant long-term reduction in habitat that is present under the existing line.

Areas disturbed due to construction activities could be restored to pre-construction contours and reseeded with a seed mix recommended by local MnDNR management and that is certified to be free of noxious weeds.

Construction equipment can spread noxious weed-propagating material to new locations. The Applicant may be required to comply with Minnesota noxious weed laws as described in Minn. R. Ch. 1505 and would observe county weed lists where they occur. Around substations and switches, weed control can be applied in a manner that does not allow for the spread of weeds onto adjacent agricultural land during operation of the transmission line.

Crews could attempt to limit ground disturbance wherever possible during the construction of the transmission line and substations. However, areas of disturbance are expected during the normal course of work, which may occur over several weeks in any one location. As

construction on each parcel is completed, disturbed areas could be restored to their original condition to the maximum extent practicable. The ROW agent would contact each property owner after construction is completed to see if any damage has occurred as a result of the Project. If damage has occurred to crops, fences or the property, Applicants would reimburse the landowner for the damages sustained. In some cases, Applicants may engage an outside contractor to restore the damaged property to as near as possible to its original condition. Resilient species of common grasses and shrubs typically reestablish areas disturbed during construction with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the proposed transmission line route may require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

- Erosion control blankets with embedded seeds;
- Silt fences; and
- Straw bales.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction permit plans. Long-term impacts are minimized by utilizing these construction techniques.

No impacts on flora or habitat are anticipated as a result of the proposed substation sites, or any of the proposed routes except for Route B, and therefore, no mitigative measures are proposed.

See Section 5.15.3 for mitigation measures associated with MCBS Sites of Biological Significance.

Route B Mitigation

Acquiring a portion of a WMA would require close coordination with the MnDNR and would likely require mitigation in the form of additional land of equal or greater ecological value. Impacts to the portion of the Hoglund WMA intersected by the route could be avoided if the transmission line were constructed on the north side of 140th Street NW.

5.20 FAUNA

Fauna is defined as the wildlife throughout the Project area and consists of birds, mammals, fish, reptiles, amphibians, mussels, and insects, both resident and migratory, which use the area habitat for forage, shelter, breeding, or as a stopover during migration. Species include those found in agricultural landscapes, prairie remnants, pasture, grasslands, wetland, trout streams and riverine habitats. This section discusses potential impacts on fauna.

5.20.1 Affected Environment

Common mammals for these habitats include raccoon (*Procyon lotor*), skunk (*Mephitis spp.*), white-tailed deer (*Odocoileus virginianus*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), badger (*Mustilidae family*), porcupine (*Erethizon dorsatum*) and rabbit (*Sylvilagus spp.*). Common birds include songbirds, hawks such as red-tailed hawk (*Buteo jamaicensis*) and cooper's hawk (*Accipter cooperii*), waterfowl, and game birds such as pheasant (*Phasianus colchinus*) and turkey (*Meleagus gallopavo*).

Throughout the Project area, there are several areas where high-quality wildlife habitat occurs naturally or is being managed. Designated habitat or conservation areas including managed areas such as MnDNR WMAs, USFWS WPAs and easements, and unmanaged areas including MnDNR designated MCBS biodiversity significance and rare native habitats and communities were analyzed within each route. Refer to Sections 5.9, 5.11, and 5.15 for a discussion of impacts and mitigation associated with each of the areas. All of these areas provide habitat for native vegetation, wildlife, and rare and unique resources.

While agricultural land uses are an important component of wildlife resources in the Project area, land managed to promote wildlife habitat can provide for higher species diversity and larger populations than surrounding intensively used landscapes.

The Migratory Bird Treaty Act of 1918 (16 United States Code (USC) 703-712) governs the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests. The Fish and Wildlife Conservation Act of 1980 (16 USC 2901-2911) affords protection to Birds of Conservation Concern (BCC). Migratory birds and BCC are an important component of biodiversity in North America. Many species are known to occur in the Project area in a variety of habitats, grasslands, and wetlands. Additionally, the 1940 Bald and Golden Eagle Protection Act (16 USC 668-668C) specifically prohibits the taking or possession of and commerce in bald eagles (*Haliaeetus leucocephalus)* and golden eagles (*Aquila chrysaetos*), either alive or dead, or any part, nest, or egg of these eagles.

Common wildlife species found within the regional area include large and small mammals, songbirds, waterfowl, raptors, reptiles, and amphibians. Appendix D presents a list of common mammal, bird, reptile and amphibian species that may occur within the area.

5.20.2 Potential Impacts

There is potential for the displacement of wildlife and loss of habitat from construction of the Project. Wildlife could be impacted in the short-term within the immediate area of construction. The distance that animals would be displaced would depend on the species. Additionally, these

animals would be typical of those found in agricultural and urban settings and should not incur population level effects due to construction.

Temporary impacts to fauna would take place most intensively at the structure locations (requiring one acre per span of transmission line) where borings would take place and spoils would be stored. Staging areas and stringing areas would also temporarily impact fauna within the Project construction area. Grading could occur at the staging areas if they are not located in previously disturbed sites. Clearing for access roads would be limited as much as possible and would be at maximum 20 feet wide. In forested areas, clearing would be limited to only those trees necessary to permit the passage of removed and the area restored to original condition.

Raptors, waterfowl, and other bird species may be affected by the construction and placement of the transmission line. Avian collisions are a possibility after the completion of the transmission line but typically due to the larger size of conductors associated with transmission lines compared to distribution lines; transmission line conductors are more visible. Transmission lines oriented in a north/south alignment can increase potential collision hazards by reducing visibility into the horizon during sunrise or sunset especially if the transmission line divides feeding and resting areas. Waterfowl typically are more susceptible to transmission line collision, especially if the transmission line is placed between agricultural fields that serve as feeding areas, and wetlands or open water, which serve as resting areas. In these areas, it is likely that waterfowl and other birds would be traveling between different habitats, potentially increasing the likelihood of avian conflicts with the transmission line. Because of the high density of birds in such nesting sites, disturbance to the site has the potential to impact individuals. Species' population reproductive success is not likely to be impacted. Construction impacts to these areas would be minimized as much as possible in coordination with the MnDNR.

Electrocution of large birds, such as raptors, is a concern typically related to distribution lines. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. The Applicant's transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution. As such, electrocution is not a concern related to this Project.

Habitat fragmentation could be caused by the transmission line bisecting habitats. Because the proposed transmission line follows existing features such as roads, transmission lines, or field lines, very few new routes would be created as a result of this Project. Areas of sensitive habitat would be spanned as much as possible. Impacts from habitat fragmentation can extend beyond the area disturbed by a new route. Fragmentation affects some wildlife species by creating barriers to daily migrations. Predation can increase among animals that are forced out of cover as they search for food, and decreases the distance that predators may have to travel to penetrate large habitat areas. Some species depend on large areas of undisturbed habitat and their survivability decreases as fragmentation increases.

Game species are not likely to be negatively affected by this Project. No impacts would occur to WPAs and WMAs can be avoided. Native habitats would be spanned wherever feasible, impacts to these species' habitat would be small. Similarly, because transmission line routing avoids direct

impacts on lakes and rivers, impacts on fisheries would be small. Any impacts, temporary or permanent, are unlikely to affect population levels of these species.

Applicant Preferred Route

There is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat in the Applicant Preferred Route. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species would only be displaced a short distance. Also, it is likely that the least amount of impacts to fauna would occur from the Applicant Preferred Route because it is the shortest route.

Route A

There is a potential for temporary displacement of wildlife during construction and for loss of small amounts of habitat in Route A; however, it is likely that species would only be displaced a short distance since there is similar habitat close by. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species would only be displaced a short distance.

Route B

There is a potential for temporary displacement of wildlife during construction and for loss of small amounts of habitat in Route B; however, it is likely that species would only be displaced a short distance since there is similar habitat close by. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species would only be displaced a short distance.

Route C

Similar to Route B, there is a potential for temporary displacement of wildlife during construction and for loss of small amounts of habitat in Route C. However, it is likely that species would only be displaced a short distance since there is similar habitat close by. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species would only be displaced a short distance.

Route D

Like all of the alternatives, there is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat from Route D. Comparable habitat is adjacent to the route for habitat types that occur in the area, therefore, it is likely that species would only be displaced a short distance.

Quarry Substation Site 1

The land use associated with Quarry Substation Site 1 is mostly agricultural. Impacts on wildlife at this location are expected to be minimal due to the abundance of similar adjacent habitat. Permanent impacts on wildlife could take place at substation locations where 40 acres of land would be changed from existing land uses, most likely agricultural, to the developed substation area.

Construction would displace wildlife; however additional impacts on wildlife are not expected. However, the Applicant would work with the appropriate agencies should sensitive wildlife or their habitats exist at these locations to minimize disturbance.

Quarry Substation Site 2

The land use associated with Quarry Substation Site 2 is mostly agricultural. Impacts on wildlife at this location are expected to be minimal due to the abundance of similar adjacent habitat. Permanent impacts on wildlife could take place at substation locations where 40 acres of land would be changed from existing land uses, most likely agricultural, to the developed substation area.

Construction would displace wildlife; however additional impacts on wildlife are not expected. However, the Applicant would work with the appropriate agencies should sensitive wildlife or their habitats exist at these locations to minimize disturbance.

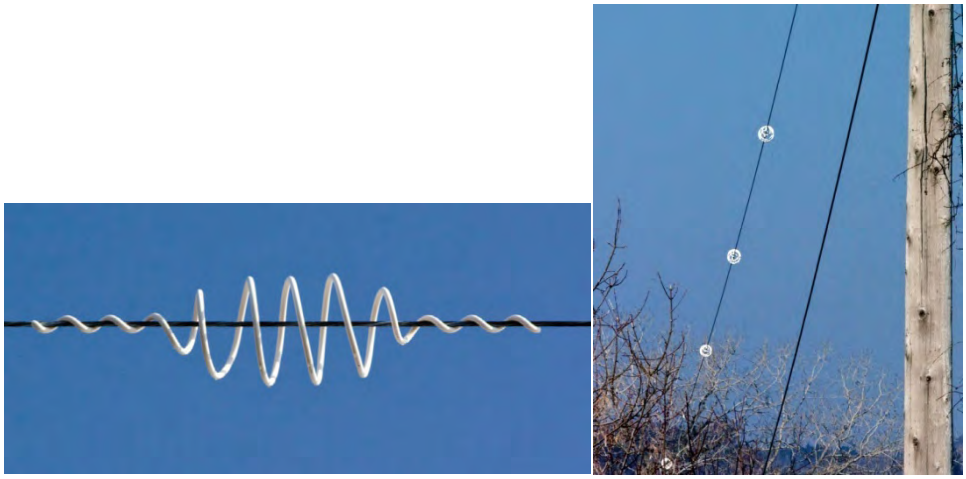
Quarry Substation Site 3 and the 115 kV Interconnect

The land use associated with Quarry Substation Site 3 and the 115 kV Interconnect are cropland and grassland. The Project would expect impacts on wildlife at these locations to be minimal due to the abundance of similar adjacent habitat. Permanent impacts on wildlife could take place at substation locations where approximately 15 acres of land would be changed from existing land uses, most likely agricultural, to the developed substation area.

5.20.3 Mitigation

The Applicant intends to address avian issues at water body crossings and other areas of concern by working with the MnDNR and USFWS to identify any areas that may require marking transmission line shield wires or to use alternate structures to reduce the likelihood of collisions.

Diagram 5-5. Transmission Line Shield Wires



Source: CapX2020. 2009. Birds and Power Lines. CapX2020 Fact Sheets.

To mitigate possible impacts to wildlife, the Applicant intends to avoid areas known as major flyways or migratory resting spots, and span designated high quality wildlife habitat areas wherever feasible (see Section 5.15 for a discussion of Rare and Unique Species, including high

quality wildlife habitat areas). Areas disturbed due to construction activities can be restored to pre-construction contours and can be reseeded with a MnDNR-recommended seed mix that is free of noxious weeds. In areas where complete spanning is not possible, the Applicant can minimize the number of structures placed in high quality wildlife habitat by coordinating with the MnDNR and USFWS to determine appropriate minimization or mitigation measures.

In 2002, Xcel Energy, entered into a voluntary Memorandum of Understanding (MOU) with the USFWS to work together to address avian issues throughout its service territories. In August 2009 Xcel Energy submitted a draft avian protection plan to the USFWS. As of the date of publication of this EIS the avian protection plan is being reviewed by the USFWS.

Applicant Preferred Route Mitigation

The majority of the Applicant Preferred Route is co-located with existing ROWs that has been previously disturbed this reduces the need for additional tree clearing that could increase fragmentation.

Route A Mitigation

Route A has been routed, to the extent possible, to be co-located with existing ROWs to minimize additional tree clearing that could increase fragmentation. However, this route is only 92 percent co-located, which is 3 percent less than the Applicant Preferred Route.

Route B Mitigation

Route B has been routed, to the extent possible, to be co-located with existing ROWs to minimize additional tree clearing that could increase fragmentation. However, this route is only 91 percent co-located, which is 4 percent less than the Applicant Preferred Route.

Route C Mitigation

This route is similar to Route B, however Route C route has more co-location and is slightly shorter than Route B.

Route D Mitigation

Route D has been routed, to the extent possible, to be co-located with existing ROWs to minimize additional tree clearing that could increase fragmentation. This route is more than 97 percent co-located which represents the greatest co-location of all of the alternatives.

Quarry Substation Site 1 and 2

Construction would displace wildlife; however, additional impacts on wildlife are not expected. The Applicant intends to work with the appropriate agencies should sensitive wildlife or their habitats exist at these locations to minimize disturbance.

Mitigation for Quarry Substation Site 3 and the 115 kV Interconnect

Construction would displace wildlife; however, additional impacts on wildlife are not expected. The Applicant intends to work with the appropriate agencies should sensitive wildlife or their habitats exist at these locations to minimize disturbance. Restricted lot size would reduce the overall facility size and therefore minimize impacts compared to the other alternatives.

5.21 AIR QUALITY

Transmission lines and substations do not produce significant amounts of air pollutants. This section discusses the potential for ozone and nitrogen oxide production from transmission lines. During construction, it is possible that fugitive dust can be created resulting from soil disturbance and released into the atmosphere. The entire project area is in attainment with National and Minnesota Ambient Air Quality Standards for all criteria pollutants with the exception of Wright County.

5.21.1 Affected Environment

The affected environment includes portions of Stearns, Sherburne and Wright Counties near transmission line and substation sites. Stearns and Sherburne counties are classified as attainment areas for all criteria air pollutants (Carbon Monoxide - CO, Lead - Pb, Nitrogen Dioxide - NO_x, Particulate Matter (PM_{10} and $PM_{2.5}$), Ozone – O_3, and Sulfur Dioxide – SO_2). Wright County is classified as an attainment area for all criteria pollutants except for Carbon Monoxide, for which part of the county it is classified as a maintenance area. A maintenance area is an area previously designated as a non-attainment area, and subsequently re-designated as an attainment area subject to the requirement to develop a maintenance plan under section 175A of the Clean Air Act. For Wright County, the re-designation to attainment (maintenance) occurred on November 29, 1999 for CO.

Currently, ambient air monitoring data are collected for $PM_{2.5}$, O_3, and CO for at least one station within Stearns, Sherburne, and Wright counties. Ambient air monitoring data taken from these stations, provided in Appendix E, show that monitored data are lower than the National Ambient Air Quality Standards found in Table 5-55. Other criteria pollutants are not currently monitored within the three counties.

Table 5-55. National Ambient Air Quality Standards

National Ambient Air Quality Standards			
Pollutant	**Primary Stds.**	**Averaging Times**	**Secondary Stds.**
Carbon Monoxide	9 ppm (10 mg/m3)	8-hour(1)	None
	35 ppm (40 mg/m3)	1-hour(1)	None
Lead	0.15 µg/ m3	Rolling 3-Month Average	Same as Primary
	1.5 µg/ m3	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/ m3)	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM10)	150 µg/ m3	24-hour(2)	Same as Primary
Particulate Matter (PM2.5)	15.0 µg/ m3	Annual(3) (Arith. Mean)	Same as Primary
	35 µg/ m3	24-hour(4)	Same as Primary
Ozone	0.075 ppm (2008 standard)	8-hour(5)	Same as Primary
	0.08 ppm (1997 standard)	8-hour(6)	Same as Primary
	0.12 ppm	1-hour(7) (Applies only in limited areas)	Same as Primary
Sulfur Dioxide	0.03 ppm	Annual (Arith. Mean)	[see below]
	0.14 ppm	24-hour(1)	[see below]
	[see above]	3-hour(1)	0.5 ppm (1300 µg/m3)

Source: www.epa.gov/air/criteria.html - Information Retrieved November 13, 2009.

Notes:

1 Not to be exceeded more than once per year.

2 Not to be exceeded more than once per year on average over 3 years.

3 To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

4 To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

5 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

6 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm. The 1997 standard – and the implementation rules for that standard – would remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard (0.08 ppm) to the 2008 ozone standard (0.075 ppm).

7 The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1. As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the fourteen 8-hour ozone nonattainment Early Action Compact Areas. The 1-hour ozone standard does not apply to the Project area.

Minnesota has AAQS which differ slightly from the National Ambient Air Quality Standards shown above, including standards for Hydrogen Sulfide (H_2S), a 1-hour standard for SO_2, and an

annual standard for PM_{10}. Relative to the 2008 ozone standard, Minnesota Pollution Control Agency recommended to EPA in a March 10, 2009, letter that the entire state be designated as attainment for the ozone standard (see Appendix F). Following is a description of impacts and mitigation with respect to air quality. The impacts and mitigation would be the same for the four proposed routes and three substations.

5.21.2 Potential Impacts

The only pollutants of concern relating to transmission lines are O_3 and NO_x. However, transmission lines and substations do not produce significant amounts of these air pollutants, as the only potential air emissions from a 345 kV transmission line result from corona and are limited.

Corona consists of the breakdown or ionization of air in a few centimeters or less immediately surrounding conductors and can produce ozone and oxides of nitrogen in the air surrounding the conductor. For a 345 kV transmission line, the conductor gradient surface is usually below the air breakdown level. Typically, some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona. Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short lived.

During construction of the proposed transmission line and substation, there would be limited emissions due to exhaust from vehicles and other construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by construction-related emissions are expected to occur during this phase of activity. The magnitude of the construction emissions is influenced heavily by the specific construction activity occurring. Weather conditions – specifically stable weather conditions – can also contribute to high concentrations of pollution. If construction activities are high during stable periods, concentrations of pollution due to construction would also tend to be high close to the sources of the pollution. Exhaust emissions, primarily from diesel equipment, would vary according to the phase of construction, but would be minimal and temporary. Adverse impacts on the surrounding environment would be minimal because of the short and intermittent nature of the exhaust emission and dust-producing construction phases.

5.21.3 Mitigation

To minimize or avoid temporary impacts from fugitive dust, BMPs can be used such as:

- Avoid using oil and other petroleum derivatives for dust control.
- Enforcement speed limits, based on road conditions, to reduce dust problems.

- Not operating equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, until repairs or adjustments are made.
- Disallow burning or burying waste materials on the ROW and dispose all waste materials at permitted waste disposal areas or landfills.
- The emission of dust into the atmosphere during construction could be minimized to the extent practical during the manufacturing, handling, and storage of concrete aggregate. During these operations, methods and equipment could be used as necessary for the collection and disposal or prevention of dust. The methods of storing and handling cement and cement additives can also include means of minimizing atmospheric discharges of dust.

5.22 NOISE

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

Cumulative noise increases occur on a logarithmic scale. If a noise source is doubled, there is a three dBA increase in noise, which is barely discernible to the human ear. For cumulative increases resulting from sources of different magnitudes, the rule of thumb is that if there is a difference of greater than ten dBA between noise sources, there would be no additive effect (i.e., only the louder source would be heard and the quieter source would not contribute to noise levels). Therefore, predicted noise levels associated with the transmission line are typically much lower than the ambient noise in the Project area and would not increase the existing background noise levels in the Project area. Table 5-56 below provides noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here in context.

Table 5-56. Noise Levels Associated with Common Sources

Sound Pressure Level (dBA)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Concert
110	Pneumatic chipper (powered by compressed air or hydraulics)
100	Jointer/planer
90	Chainsaw
80	Heavy truck traffic
70	Business office
60	Conversational speech
50	Library
40	Bedroom
30	Secluded woods Source: A Guide to Noise Control in Minnesota, MPCA (revised, 1999)
20	Whisper

Source: A Guide to Noise Control in Minnesota, MPCA (revised, 1999)

The Minnesota Pollution Control Agency (MPCA) has established standards for the regulation of noise levels. The land use activities associated with residential, commercial and industrial land have been grouped together into Noise Area Classifications (NAC). See Minn. R. 7030.0050.

Each NAC is then assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits for land use activities within the NAC. See Minn. R. 7030.0040. Table 5-57 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a one hour period; L50 is the dBA that may be exceeded 50 percent (30 minutes) of the time within an hour, while L10 is the dBA that may be exceeded 10 percent (six minutes) of the time within an hour. Residences, which are typically considered sensitive to noise, are classified as NAC 1.

Table 5-57. MPCA Noise Limits by Noise Area Classification (dBA)

Noise Area Classification	Daytime		Nighttime	
	L10	L50	L10	L50
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

5.22.1 Potential Impacts

Construction activities would generate noise that is short-term and intermittent. Construction activities would be limited to daytime hours. As such, the Project would not have significant noise effects for the surrounding area.

Transmission lines produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal and do not exceed the MPCA Noise Limits outside of the ROW.

In foggy, damp, or rainy weather, transmission lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the conductors. During heavy rain the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow and other times when there is moisture in the air, transmission lines would produce audible noise approximately equal to household background levels.

The proposed transmission lines were modeled using the Bonneville Power Administration CFI8X model to evaluate audible noise from HVTLs. Where possible, the model was executed as a worst-case scenario benchmark, to ensure that noise was not under-predicted. Table 5-58 presents the L5 and L50 predicted for proposed transmission lines for the Project. The L5 is a noise level that would not be exceeded more than five percent of the time. Using the L5 for demonstrating compliance with the MPCA L10 standard is conservative because the noise level exceeded 10 percent of the time would definitively be less than noise level exceeded five percent of the time.

Table 5-58. Calculated Audible Noise for the Operation of Proposed Single/Double Circuit Transmission Line Designs (3.28 Feet Above Ground)

Structure Type	Noise L5 (Edge of ROW, dBA)	Noise L50 (Edge of ROW, dBA)
Single Pole, Davit Arm, 345 kV/345 kV Double Circuit with one Circuit In Service	54.1	45.8

There are a number of residences within proximity of the Applicant Preferred Route, Route B, Route C ,Route D and the Interconnect routes A and B. These residences would fall within the NAC 1 category under Minnesota Rules. As such, the L10 and L50 from the Project must not exceed nighttime levels of 55 and 50 dBA at these residences, respectively. Since it is assumed that the noise levels generated by the Project would be the same at night as those generated during the daytime, compliance with the nighttime levels (more restrictive) would also demonstrate compliance with the daytime noise standards due to greater noise sensitivity of humans at night.

Noise associated with the operation of the proposed 345 kV transmission line along the Applicant Preferred Route is not predicted to exceed the limits identified by the MPCA.

Noise associated with Quarry Substation Site 1, Quarry Substation Site 2 and the Quarry Substation Site 3 would include the operation of transformers and switchgear. Transformers produce a constant low-frequency humming noise while switchgear produces an impulsive or short duration noise during infrequent activation of the circuit breakers. Due to the infrequent operation of the switchgear, the noise generated would be considered temporary in nature and not predicted to exceed the MPCA Noise Limits. In addition, the Applicant has indicated that typically if the transformer meets the National Electrical Manufacturers Association (NEMA) standard, bulk substations are large enough such that the Minnesota statutes governing noise limits are met at the site boundary. Since the Minnesota statute refers to the noise level at the point of reception, which is not usually the edge of the utility property but at the nearest normally occupied piece of property or building, meeting limits at the property boundary provides a conservative design. The Applicant has further indicated that they will use substation equipment that meets applicable NEMA standards.

5.22.2 Mitigation

There are no anticipated impacts expected from noise from the proposed routes or substations, therefore, there is no mitigation necessary.

5.23 ELECTRIC AND MAGNETIC FIELDS AND STRAY VOLTAGE

This section discusses electromagnetic fields (EMF) and stray voltage with respect to the proposed Project. The term EMF refers to electric and magnetic fields that arise from the electrical potential (voltage) and the movement of an electrical charge (current) associated with the transmission and use of electricity. Electric and magnetic fields are invisible just like radio, television, and cellular phone signals, all of which are part of the electromagnetic spectrum. The frequency of transmission line EMF in the United States is 60 hertz and falls in the extremely low frequency (ELF) range of the electromagnetic spectrum (any frequency below 300 hertz). For the lower frequencies associated with power lines, the electric and magnetic fields are typically evaluated separately. The intensity of the electric field is related to the voltage of the line, while the intensity of the magnetic field is related to the current flow along the conductors.

Concerns about health effects of electric and magnetic fields (EMF) from power lines were first raised in the late 1970s. Since then, considerable research has been conducted to determine if exposure to magnetic fields, such as those from high-voltage power lines, causes biological responses and health effects. Initial epidemiological studies done in the late 1970s showed a weak correlation between surrogate indicators of magnetic field exposure (such as wiring codes or distance from roads) and increased rates of childhood leukemia. (Wertheimer et. al, 1979). More recent studies that used direct measurements of magnetic field exposure show either a very weak, or no statistical correlation with adverse health affects, e.g., Savitz, et. al. 1988; and Toxicological and laboratory studies have not been able to show a biological mechanism between EMF and cancer or other adverse health effects.

While there are numerous internet sites devoted to EMF dangers (whether from power lines, cell phones, or radio frequency signals), the vast majority of experts believe that EMF from power lines does not cause leukemia or any other health problem. In part, these experts argue the physical impossibility of any health effect due to such low-frequency, low-energy magnetic fields.

Natural and human-made electromagnetic fields are, in fact, present everywhere in our environment. Natural electric fields in the atmosphere range from background static levels 10 to 120 volts per meter (V/m) to well over several kilovolts per meter (kV/m) produced by the build-up of electric charges in thunderstorms. The Earth itself has a magnetic field that ranges from approximately 300 to 700 milligauss (mG). In addition to the presence of the earth's steady state electric field, an average home experiences additional magnetic fields of 0.5 mG to 4 mG which arise from the general wiring and appliances located in a typical home (National Cancer Institute, 2009). .

Stray Voltage

Stray voltage is a natural phenomenon that occurs between two contact points in any animal confinement area where electricity is grounded. By code, electrical systems, including farm systems and utility distribution systems, must be grounded to the earth to ensure continuous safety and reliability. Stray voltage is a condition that can occur on the electric service entrances to structures from distribution lines—not transmission lines. More precisely, stray voltage exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Where the electrical system is grounded, some current inevitably flows

through the ground and a low level of voltage called neutral-to-earth voltage (NEV) develops at these locations. When NEV is measured between two objects that may be simultaneously contacted by an animal, it is frequently referred to as stray voltage. Stray voltage is not electrocution, ground current, EMFs, or earth current. Transmission lines have been shown to contribute to stray voltage when the electric distribution system directly serving the farm or wiring of the farm was directly under and parallel to the transmission line. These circumstances are considered during installation of transmission lines therefore mitigating the contribution of stray voltage from the Project.

5.23.1 Affected Environment

Electric fields

Electric fields are created by voltage or the difference in the electric charge between two points, and are measured in V/m or kV/m. Higher voltage produces stronger electric fields. The intensity of the electric field decreases significantly with increasing distance from the source and electric fields are easily shielded or weakened by objects such as trees, buildings, clothing and skin.

The available data for exposure to static electric fields suggest that the only negative human health effects are the direct perception of body hair movement and small shocks, similar to the shock received by the induced friction from walking on a carpet and touching a doorknob. On the whole, scientific evidence indicates that chronic exposure to electric fields at or below levels traditionally established for safety does not cause adverse health effects. Safety concerns related to electric fields are sufficiently addressed by adherence to the National Electric Safety Code (NESC).

There are currently no federal guidelines on the strength of electrical fields beneath high voltage transmission lines. However, a few states and agencies have established regulations or guidelines with regard to transmission line electric fields.

Table 5-59. Electric Field Exposure Guidelines

Organization	Electric Field Exposure Guidelines (kV/m)	
	General Public	Occupational
ICNIRP (2009)	4.2	8.3
IEEE (2002)	5	20
ACGIH (2009)	_	25

ICNIRP – International Commission on Non-Ionizing Radiation Protection
IEEE – Institute of Electrical Engineers and Electronic Engineers
ACGIH – American Conference of Governmental Industrial Hygienists

The 8 kV/m guideline used by the Minnesota Public Utilities Commission (Commission) is designed to prevent injury from shocks when touching large objects such as a bus or agricultural equipment parked under high-voltage transmission lines of 345 kV or greater. A route permit for a high-voltage transmission line typically states the line shall be designed, constructed, and

operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m.

Magnetic Fields

Magnetic fields are created by electric current or flow (measured in amperes). The higher the Magnetic fields are created by electric current or flow (measured in amperes). Higher currents produce stronger magnetic fields. However, unlike electric fields, magnetic fields are not easily shielded and pass through most structures or objects. Consequently health concerns regarding EMF have focused more closely on magnetic fields than electric fields.

We encounter magnetic fields from every-day things such as radar and microwave towers, television and computer screens, motors, fluorescent lights, microwave ovens, cell phones, electric blankets, house wiring and hundreds of other common electrical devices. As with electric fields, magnetic fields decrease in strength with increased distance from the source. The strength of both the electric and magnetic fields from transmission lines is inversely proportional to the square of the distance from the source conductors. Magnetic fields also vary in intensity depending on the type of structure and the amount of current flowing through the transmission line in a given area.

There are currently no state or federal guidelines for magnetic fields generated by high-voltage transmission lines. However, several agencies have established exposure guidelines for general public and occupational magnetic field exposure.

Table 5-60. Magnetic Field Exposure Guidelines

Organization	Magnetic Field Exposure Guidelines (mG)	
	General Public	Occupational
ICNIRP (2009)	833	4,200
IEEE (2002)	9040	27,100
ACGIH (2009)	–	10,000

ICNIRP – International Commission on Non-Ionizing Radiation Protection
IEEE – Institute of Electrical Engineers and Electronic Engineers
ACGIH – American Conference of Governmental Industrial Hygienists

Health Effects

The study of cancer in relation to ELF EMF has been a topic of study since the late 1970s. Since that time there have been several epidemiological studies that have explored the possible association of not only cancer risks, but other potential human maladies (brain tumors, leukemia, breast cancer, and mental health issues). Studies have focused on both occupational exposures for individuals working in electrical industries and public exposures for children and adults living and working around common EMF sources (in-home wiring, transmission lines, home, and office appliances/equipment). The results of the various studies conducted over the last three decades, specifically those regarding the relationship between EMF and childhood leukemia and other cancer risks, have been mixed; some have found an association while others have not.

Where there is association suggested in epidemiological studies, it is usually very near the statistical threshold of significance. However, when these studies are repeated in a laboratory, the results have not reproduced or identified a biological mechanism to support a link between childhood leukemia and magnetic fields. The replication of field results in a laboratory setting is a basic test of scientific validity. Researchers continue to look at magnetic fields until more certain conclusion can be reached.

The World Health Organization (WHO), in 1996, launched a large multidisciplinary research effort to address growing public concerns over the possible health effects from exposure to EMF. Based on in-depth review of scientific literature the WHO concluded that, "…current evidence does not confirm the existence of any health consequences from exposure to low level electromagnetic fields. However, some gaps in knowledge about biological effects exist and need further research." Leukemia is the most common childhood cancer worldwide for children ages zero to 14, with approximately 2,600 cases diagnosed in the United States annually. Unfortunately, the cause of childhood leukemia is not known. Many suspected risk factors that have been studied and evaluated, but ultimately most children with leukemia do not have any risk factors, and as stated above, the cause of their cancer is not known at this time. In the case of high-voltage power lines as a suspected risk factor, the WHO indicates that few children have time-averaged exposures to residential 60 Hz magnetic fields in excess of the levels suspected to be associated with an increased incidence of childhood leukemia. Approximately one percent to four percent have mean exposures above 3 mG and only one percent to two percent have median exposures in excess of 4 mG. If there are any risks such as childhood leukemia associated with living near power lines, then it is clear those risks are very small, otherwise we should be witnessing an observable epidemic of childhood cancers. However, there is little, if any evidence of such an epidemic of childhood cancer.

5.23.2 Potential Impacts

Electric Fields

The electric field from a transmission line can couple with a conductive object, such as a vehicle or a metal fence, which is in close proximity to the transmission line. HVTLs can induce a voltage on objects and therefore make it possible for current to flow as the object is discharged. The voltage buildup is dependent on many factors, including the weather; object shape, size, orientation, and capacitance; object to ground resistance; and location along the ROW. If these objects are insulated or semi-insulated from the ground and a person touches them, a small current would pass through the person's body to the ground. This might be accompanied by a spark discharge and mild shock, similar to what can occur when a person walks across a carpet and touches a grounded object or another person. It is important to note that underground transmission lines still generate electric fields that are detectable above the ground surface.

The main concern with induced voltage on an object is the discharge through the person to ground if contact is made with the object. The best method to avoid these discharges is to avoid parking equipment directly under the transmission line. To ensure that any discharge does not reach unsafe levels, the National Electric Safety Code (NESC) requires that any discharge be less than 5 milliamperes (ma). Based on Applicants' 115 kilovolts (kV), 230 kV, and 345 kV

transmission line operating experience, the discharge from any large mobile object—such as a bus, truck, or farm machinery— parked under or adjacent to the transmission line are less than 5 ma and would unlikely reach levels considered an annoyance. Applicants would also assure that any fixed object, such as a fence or other large permanent conductive object in close proximity to or parallel to the transmission line, would be grounded so any discharge would be less than the 5 ma NESC limit.

Similarly, the Commission's standard of maximum electric field limit of 8 kV/m measured one meter above ground was designed to prevent serious hazard from shocks when touching large objects placed under AC transmission lines of 500 kV or greater. The proposed facilities would comply with the NESC and Commission standards.

Table 5-61 provides electric fields at the maximum conductor voltage for the type of transmission line facilities proposed. Electric fields were calculated using ENVIRO, a software program licensed by the EPRI. The calculated electric field assumed the maximum operating voltage of 362 kV, which is 105 percent of the nominal voltage for the transmission line. For any specific design, the set of phase conductors height above ground has a marked influence on the maximum electric field. The phasing arrangement is of particular importance for the maximum field for a double circuit configuration (two circuits on a single structure).

Table 5-61. Transmission Line Designs (3.28 Feet Above Ground)

Structure Type	Nominal Voltage	Distance to Proposed Centerline										
		-300'	-200'	-100'	-75'	-50'	0'	50'	75'	100'	200'	300'
Single Pole Davit Arm 345 kV Single Circuit	362 kV	0.05	0.12	0.65	1.15	2.02	2.35	2.28	0.99	0.52	0.11	0.04
Single Pole Davit Arm 345 kV/345 kV Double Circuit with One Circuit In Service	362 kV	0.04	0.08	0.11	0.19	0.22	3.76	1.58	0.40	0.18	0.12	0.06
Single Pole Davit Arm 345 kV/345 kV Double Circuit with Both Circuits In Service	362 kV	0.02	0.05	0.15	0.42	1.41	2.48	1.41	0.42	0.15	0.05	0.02

The predicted electric field strengths range from 2.35 kV/m to 3.76 kV/m at the mid-point of the proposed line. These levels are considerably less than the recommended exposure guidelines listed in Table 5-60 and the Commission's maximum safety limit of 8 kV/m.

Magnetic Fields

Table 5-62 provides calculated magnetic fields for each structure and conductor configuration proposed for the Project. Magnetic fields were calculated for each section of the Project and under two system conditions: the expected peak and average current flows as projected for the year 2011, under normal system intact conditions. Current is given in amps. The peak magnetic field values are calculated at a point directly under the transmission line and where the conductor is closest to the ground. The same method is used to calculate the magnetic field at varying distances from the alignment of the structure. The magnetic field profile data show that magnetic field levels decrease rapidly (inverse square of the distance from source) from the alignment.

Because the magnetic field produced by the transmission line is dependent on the current flowing on its conductors, the actual magnetic field when the Project is in service is typically less than that shown in the table. This is because the calculations in the figures represent the

magnetic field with current flow at expected normal system peak conditions. Actual current flow on the transmission line would vary as magnetic field changes throughout the day and would be less than peak levels during most hours of the year.

Table 5-62 provides magnetic fields at the expected peak and average current flows as projected for the year 2011.

Table 5-62. Calculated Magnetic Fields (ma) for Proposed Double Circuit 345 kV Transmission Line Designs (3.28 Feet Above Ground)

Structure Type	System Condition	Current (Amps)	Distance to Proposed Centerline										
			-300'	-200'	-100'	-75'	-50'	0'	50'	75'	100'	200'	300'
Single Pole Davit Arm 345 kV Single Circuit	Peak	566	1.71	3.62	12.11	18.73	30.87	68.35	38.37	21.79	13.37	3.52	1.53
	Average	339	1.02	2.17	7.25	11.22	18.49	40.94	22.98	13.05	8.01	2.11	0.91
Single Pole Davit Arm 345 kV/345 kV Double Circuit with One Circuit In Service	Peak	566	1.53	3.18	9.50	13.79	21.20	54.92	38.97	23.79	15.23	4.21	1.85
	Average	339	0.91	1.91	5.69	8.26	12.70	32.89	23.34	14.25	9.12	2.52	1.11
Single Pole Davit Arm 345 kV/345 kV Double Circuit with both Circuits In Service	Peak	566	0.41	1.24	7.12	13.02	25.64	64.38	25.95	13.24	7.26	1.27	0.42
	Average	339	0.25	0.74	4.26	7.80	15.36	38.56	15.54	7.93	4.35	0.76	0.25

Predicted magnetic field strengths range from 32.89 to 68.35 milliguass at the mid-point of the proposed line. These levels are considerably less than the recommended exposure guidelines listed in Table 5-60.

Although the line would be built with double circuit capable poles, only a single circuit would be installed for this Project. Electric and magnetic fields are lower for a double circuit configuration than for a single circuit configuration. The lower predicted values for a double circuit configuration results from a cancellation effect when two circuits on a single structure are designed to operate under opposite phases. Based on the proposed design and operation of the Project, no impacts are anticipated due to EMF.

Stray Voltage

The primary concern with stray voltage has been it's potential effect on farm animals that are confined in areas where electrical distribution systems supply the farm. Transmission lines do

not, by themselves, create stray voltage because they do not connect to businesses or residences. However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.

Electrical current flowing between the neutral wire and ground is a normal part of electrical systems. Stray voltage problems are most often the result of the system not operating properly. This abnormal condition leading to stray voltage can be caused by poor grounding conditions, inadequate connections, lightening strikes, or undersized neutral conductors. Issues with stray voltage can also arise in circumstances where transmission lines are directly over or parallel to the electric distribution system serving the farm. Stray voltage can cause impacts to dairy farming operations and milk production. Issues are typically related to the distribution and service lines directly serving a farm or wiring on a farm. Issues with stray voltage can arise in circumstances where transmission lines are directly over or parallel to the electric distribution system serving the farm.

5.23.3 Mitigation

Electromagnetic Fields

There are no anticipated impacts attributed to EMF from the Project, therefore, mitigation would not be needed. However, three primary methods to reduce EMF exposure for the Project are explained below.

Magnetic field exposure is directly related to distance from the transmission line, therefore, as indicated in the route permit application, the applicants have selected route options and designs in part to avoid residences to the greatest possible extent. Also, the proposed ROW and the structures can be designed to help minimize EMF exposure.

The configuration and distance between transmission line phases has an impact on EMF exposure. The amount of EMF exposure is reduced when the phases are compacted. The applicants could consider compacted structure designs where feasible.

Phase cancellation significantly reduces EMF from transmission lines. For the double-circuit lines, rearranging phase conductors may help to reduce magnetic field strength. The applicants could consider these options during the detailed Project design phase.

Stray Voltage

Mitigation of potential stray voltage impacts would include that all safety requirements are met during the construction and operation of the Project. Appropriate measures would be taken to prevent stray voltage problems when the transmission lines proposed in this Project parallel or cross distribution lines.

5.24 IMPLANTABLE MEDICAL DEVICES

5.24.1 Affected Environment

Implantable medical devices (IMDs) are those that are intended to be completely or partially introduced into the human body, indefinitely. Common IMDs include: pacemakers, implantable cardioverter defibrillators (ICDs), neurostimulators, cochlear implants and insulin pumps. Interference with the operation of pacemakers and implantable cardioverters/defibrillators is a potential impact of electric fields. Interference with IMDs can occur if the electric field intensity is high enough to induce sufficient body currents to cause interaction. Modern bipolar devices are much less susceptible to interactions with electric fields.

5.24.2 Potential Impacts

Medtronic and Guidant, manufacturers of pacemakers and implantable cardioverters/ defibrillators, have indicated that electric fields below 6 kV/meter are unlikely to cause interactions affecting operation of most of their devices (Wisconsin PSC, 2009).

Older unipolar designs are more susceptible to electric field interference. Research completed by Toivoen et al. (1991) indicated that the earliest evidence of interference was in electric fields ranging from 1.2 to 1.7 kV/meter. For older style unipolar designs, the electric field for some proposed structure types does exceed levels that Toivoen et al. has indicated may produce interference. However, a recent paper (Scholten et al., 2005) concludes that the risk of interference inhibition of unipolar cardiac pacemakers from high voltage power lines in everyday life is small. In the unlikely event a pacemaker is impacted, the effect is typically a temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker returns to its normal operation when the person moves away from the source of the interference.

There would be no anticipated impacts on implantable medical devices as a result of the Project.

5.24.3 Mitigation

There are no anticipated impacts to implantable medical devices expected from the Project, therefore, mitigation would not be needed.

5.25 FARMING OPERATIONS, VEHICLE USE, AND METAL BUILDINGS LOCATED NEAR POWER LINES

5.25.1 Affected Environment

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge would drain off 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.

Farm equipment, passenger vehicles, and trucks may be safely used under and near power lines. The power lines would be designed to meet or exceed minimum clearance requirements over roads, driveways, cultivated fields, and grazing lands specified by the NESC.

Buildings are permitted near transmission lines, but are generally prohibited within the ROW itself because a structure under a transmission line may interfere with safe operation. For example, a fire in a building located in the ROW could damage a transmission line.

5.25.2 Potential Impacts

A potential for shocks from insulated electric fences exists when located near HVTL. There is also a slight potential for vehicles under HVTLs to build up an electric charge. Typically, however the vehicle remains grounded through the tires.

5.25.3 Mitigation

Potential shocks from insulated electric fences can be prevented by using two methods: i) one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected; or, ii) an electric filter can be installed that grounds out charges induced from a power line while still allowing the charger to be effective.

Recommended clearances for farm equipment, passenger vehicles, and trucks within the NESC are designed to accommodate a relative vehicle height of 14 feet.

There is a potential for vehicles under HVTLs to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap long enough to touch the earth. However, such buildup is a rare event because vehicles generally are effectively grounded through tires. Modern tires provide an electrical path to the ground because carbon black, a good electricity conductor, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles would not normally build up charge unless they have unusually old tires or are parked on dry rock, plastic or other surfaces that insulate them from the ground.

Another safety issue that arises when operating vehicles near power lines is refueling. The possibility of fuel ignition under a power line is remote. Nevertheless, refueling vehicles directly under or within 100 feet of a transmission line 200 kV or greater is not recommended.

To prevent damage to a transmission line as a result of an issue with a building located within the ROW, NESC guidelines establish clear zones for transmission facilities. Metal buildings may

have unique issues. For example, metal buildings near transmission lines of 200 kV or greater must be properly grounded.

5.26 WIRELESS TECHNOLOGIES

Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted (corona consists of the breakdown or ionization of air within a few centimeters of conductors and hardware). This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations can be restored by appropriate modification of (or addition to) the receiving antenna system. Moreover, AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the ROW to either side.

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 Megahertz), and

The excellent interference rejection properties inherent in FM radio systems make them virtually immune to amplitude type disturbances.Digital reception is in most cases more tolerant of noise and somewhat less resistant to multipath reflections (i.e., reflections from structures) than analog broadcasts.

5.26.1 Potential Impacts

A two-way mobile radio located immediately adjacent to and behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects.

Although digital reception is more tolerant of RF noise, if the noise levels or reflections are great enough, they would impact digital television reception.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose or damaged hardware may also cause television interference. The transmission line hardware can be designed and maintained to minimize gap and corona discharges. There is a potential for interference impacts to occur to omnidirectional communication towers. The height of the transmission line may interfere with beam paths. If interference occurs, Applicants intend to work with the microwave tower owner to mitigate the impacts.

If interference from transmission line corona does occur for an AM radio station that is within the station's primary coverage area and that had good reception before the Project was built, satisfactory reception can be obtained by appropriate modification of the receiving antenna system. The transition to digital TV broadcasts would be complete by the time the Project is constructed.

No widespread interference to television or radio reception is anticipated as a result of the Project.

5.26.2 Mitigation

Movement of either mobile radio unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower.

If isolated radio or television interference occurs because of the transmission line, the Applicant intends to work with the affected landowner to restore reception to pre-Project quality.

If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, Applicants can inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the present level, including the appropriate modification of receiving antenna systems if deemed necessary.

In the rare occasion where the construction of the Project may cause interference within a television station's primary coverage area, Applicants would work with the affected viewers to correct the problem, which can usually be corrected with the addition of an outside antenna.

5.27 EXISTING UTILITIES

Two underground pipelines exist in the Project area. The Amoco liquid pipeline runs from northwest to southeast, just south of the Applicant Preferred Route and Route A. The NSP high-pressure gas line is located on the northern side of the proposed routes and intersects Route D approximately halfway between St. Cloud and Monticello.

The Applicant Preferred Route, Route A, and all proposed Quarry Substations Sites would not impact any pipelines.

5.27.1 Potential Impacts

When an HVTL is located adjacent to a pipeline ROW, the pipeline may be subjected to electrical interference from electric and magnetic induction, conductive interference and capacitive effects. Electric and magnetic induction is the primary effect of the high voltage AC transmission line on a buried pipeline during normal (steady state) operation. This form of interference is due to the magnetic field produced by the AC current flowing in the conductors of the transmission line coupling with the metallic pipeline, inducing a voltage and associated current on the pipeline.

Conductive interference is a concern when a transmission line fault occurs in proximity to the pipeline, as it can cause AC currents to enter the pipeline at coating holidays (flaws in the coating) and produce a voltage gradient across the pipeline coating. Electric and magnetic effects are also a concern during a fault because the phase current in at least one phase (conductor) of the high voltage AC transmission line is elevated.

Capacity effects are typically only a concern during pipeline construction when long sections of the pipeline are above ground. To prevent contact shock hazards, proper horizontal and vertical separation between the transmission line's conductors and equipment used during pipeline construction and maintenance (such as cranes and shovels) must be maintained.

If these electrical interference effects are great enough during normal operation, then a potential shock hazard exists for anyone that touches an aboveground part of the pipeline, such as a valve or cathodic protection test station. In addition, during normal operation, if the induced AC current density at a flaw in the pipeline coating is great enough, AC pipeline corrosion may occur. Lastly, damage to the pipeline coating can occur if the voltage between the pipeline and surrounding soil becomes excessive during a fault condition.

Applicant Preferred Route

The Applicant Preferred Route would not cross either pipeline; therefore no impacts to either pipeline are expected.

Route A

Route A would not cross either pipeline; however, in Clearwater Township, Route A comes within approximately one-tenth of a mile from the Amoco pipeline.

Route B

Route B would cross the Amoco pipeline approximately five times within Silver Creek Township. The first crossing would occur at Filmore Avenue NW between 140th Street NW and 150th Street NW. The second crossing occurs at the intersection of Endicott Avenue NW and 140th Street. The third crossing occurs just south of 140th Street NW and County Highway 8. The fourth crossing occurs near the intersection of Dempsey Avenue NW and 134th Street NW. The fifth crossing occurs at Crofoot Avenue NW between 127th Street NW and 134th Street NW.

Route C

Route B would cross the Amoco pipeline two times within Silver Creek Township. The first crossing would occur at Filmore Avenue NW between 140th Street NW and 150th Street NW. The second crossing occurs at the intersection of Armitage Avenue NW and 127th Street NE.

Route D

Route B would cross the NSP high pressure gas line only once. The crossing would occur near State Highway 24 and 117th Street.

5.27.2 Mitigation

With proper planning and mitigation, pipelines and high voltage AC transmission lines can be safely collocated. The AC interference effects can be predicted with computer modeling. The National Association of Corrosion Engineers has standards that ensure that pipeline integrity would not be degraded nor personnel safety compromised because of AC interference from a transmission line constructed and operated adjacent to a pipeline. Mitigation techniques for AC interference on pipelines include reducing the impedance of the transmission structure grounds, grounding the pipeline in conjunction with de-couplers, burying gradient control wires along the pipeline or burying ground mats under aboveground facilities (such as valves) and using dead fronts at test stations.

None of these mitigation methods would be expected to require additional ROW. Reducing transmission impedance consists of adding stacked or parallel ground rods to the structure grounding system. This is done adjacent to the transmission structure, thus no additional transmission line ROW is required. Grounding a pipeline typically occurs within the existing pipeline through a de-coupler device to prevent DC cathodic protection current from flowing to the ground. Gradient control wires are typically copper conductors buried parallel to and adjacent to the pipeline (within 5 to 10 feet).

Ground mats consist of an eight-foot-square section of conductors buried underneath where pipeline personnel stand when operating a valve. Dead fronts consist of replacing the existing test sections with test sections that are non-conductive and require no additional land. Lastly, additional "coupon stations" are sometimes installed to monitor the pipeline to insure that mitigative measures are effective at preventing AC pipeline corrosion. These facilities are installed adjacent to the pipeline and use coupons that are exposed to the same environment as

the pipeline and are monitored to determine if AC corrosion is occurring. This typically would not require additional ROW.

The Applicants would insure that computer modeling of AC interference effects is completed and that any required mitigation is designed and installed prior to energizing the transmission line. Based on past projects, the cost to complete computer modeling, mitigation design, and installation is low compared to the overall cost of the Project. The Applicants have been meeting and working with all known pipeline owners to ensure that there is proper separation between the proposed transmission line and pipelines to meet safety requirements.

6.0 PERMITS AND APPROVALS

There are several permits and approvals that must be obtained for the Project in addition to the state Route Permit. Below is a list and a brief description of permits and approvals that are required by local, state, and federal governments.

Table 6-1. Potential Permits and Approvals

Permit	Jurisdiction
Local Approvals	
Road Crossing/ROW Permits	County, Township, City
Lands Permits	County, Township, City
Building Permits	County, Township, City
Over width Loads Permits	County, Township, City
Driveway/Access Permits	County, Township, City
Minnesota State Approvals	
Certificate of Need	Minnesota PUC
Route Permit	Minnesota PUC
Cultural and Historical Resources Review	Minnesota SHPO
Endangered Species Consultation	Minnesota DNR - Ecological Services
License to Cross Public Waters	Minnesota DNR - Lands and Minerals
Utility Permit	Mn/DOT
Wetland Conservation Act	BWSR
NPDES Permit	MPCA
Federal Approvals	
Section 10 Permit	USACE
Section 404 Permit	USACE
Permit to Cross Federal Aid Highway	FHWA
Notice of Proposed Construction (7460-1)	FAA
Notice of Actual Construction or Alteration	FAA
Farmland Protection Policy Act/Farmland Conversion Impact Rating	USDA/NRCS
Spill Prevention, Control and Countermeasure (SPCC) Plan	EPA
Compatibility Analysis of Disturbed Easements/Lands	USFWS

6.1 LOCAL APPROVALS

Typical local approvals associated with transmission line construction are listed in the table above. Descriptions of the potential permits required for the project are defined below.

Road Crossing/ROW Permits

These permits may be required to cross or occupy county, township, and city road ROW.

Lands Permits

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

Building Permits

These permits may be required by the local jurisdictions for substation modifications and construction.

Over width/Loads Permits

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

Driveway/Access Permits

These permits may be required to construct access roads or driveways from county, township or city roadways.

6.2 STATE OF MINNESOTA APPROVALS

Certificate of Need

Prior to issuance of a route permit, a Certificate of Need is required from the PUC.

Route Permit

HVTLs cannot be constructed without a route permit approved by the PUC.

Cultural and Historic Resources Review

A cultural and historic resources review was conducted by the Minnesota SHPO. This review assists the Applicants in identifying potential impacts to cultural and historic resources.

Endangered Species Consultation

The Minnesota DNR Natural Heritage and Nongame Research Program collects, manages, and interprets information about nongame species. Consultation was requested from the department for the Project regarding rare and unique species.

License to Cross Public Waters

The Minnesota DNR Division of Lands and Minerals regulates utility crossings over, under, or across any State land or public water identified on Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minnesota Statues §84.415 and Minnesota Rules §6135. The Applicants would file these permits once the design of the transmission line is complete and would acquire the permit prior to construction.

Utility Permit

A permit from the Mn/DOT is required for construction, placement, or maintenance of utility lines that occur adjacent or across the highway ROW. The Applicants would file for this permit once the design of the transmission line is complete and would require the permit prior to construction.

NPDES Permit

A NPDES permit is required for stormwater discharges associated with the construction activities disturbing equal to greater than one acre. A requirement of the permit is to develop and implement a stormwater pollution prevention plan (SWPPP), which includes BMPs to minimize discharge of pollutants from the site. This permit would be acquired since the construction would cause a disturbance of greater than one acre for the whole of the Project.

6.3 FEDERAL APPROVALS

Section 401 Permit

Section 401 Water Quality Certification is regulated by the Minnesota Pollution Control Agency under Section 401 of the Clean Water Act 33 U.S.C. 1344. The applicants would apply for this certification if a Section 404 permit is required.

Section 10 Permit

The USACE regulates impacts to navigable waters of the U.S. The Mississippi River is classified by the USACE as navigable water, and the Applicants would apply for a permit for each of the crossings proposed for the Project.

Section 404 Permit

A Section 404 permit is required from the USACE for discharges of dredged or fill material into waters of the U.S. The Applicants would apply for these permits once a route is awarded for the Project.

Notice of Proposed Construction

Notice and approval are required for structures 200 feet in height or the height of the structures would exceed a slope requirement as defined in the FAA Advisory Circular (AC 70/7460-2K). Form 7460-1 is required for the notice.

Notice of Actual Construction or Alteration

This is required to provide the FAA with final construction as-built information for their records, using Form 7460-2.

Farmland Protection Policy Act/Farmland Conversion Impact Rating

The intent of the Farmland Protection Policy Act is to minimize the conversion of farmland to nonagricultural uses by Federal projects. The Applicants would work with The Department of Agriculture to meet the requirements of this program.

Spill Prevention, Control and Countermeasure Plan

A Spill Prevention, Control and Countermeasure Plan is required to prevent discharge of oil into navigable waters of the U.S., and is required if the aboveground storage capacity for the substance is greater than 1,320 gallons and there is a reasonable expectation of a discharge into navigable waters of the U.S. The Applicants would update and develop their SPCC Plan at substations meeting the criteria per 40 CFR 112.

Compatibility Analysis of Disturbed Easements/Lands

This permit is required for work within easements owned by the USFWS. Compatibility is determined in accordance with the National Wildlife Refuge System Improvement Act. A compatible use is a wildlife-dependent recreational use or any other use on lands that in the sound professional judgment of the director would not materially interfere with or detract from the fulfillment of the mission of the USFWS (wildlife conservation) or purposes of the land. The Applicants intend to work closely with the USFWS on potential impacts to their lands.

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