

Application to the Public Utilities Commission for a Route Permit

Northstar Transmission, LLC
Northstar 161 kV Transmission Line Project

Alternative Permitting Process
PUC Docket Number: TL-08-1120

October 2008

PART I NARRATIVE



TETRA TECH EC, INC.



TETRA TECH EC, INC.

October 28, 2008

Dr. Burl W. Haar
Executive Secretary
Minnesota Public Utilities Commission
121 Seventh Place East, Suite 350
Saint Paul, MN 55101-2147

In the Matter of the Application for a Route Permit Under Alternative Permitting Process for the Proposed 161 kV Northstar Transmission Line and Associated Facilities: Docket # TL 08-1120

Dear Dr. Haar:

Under a separate e-file submission, dated today, please find Northstar Transmission, LLC's (Northstar) Route Permit Application for the Northstar Transmission Line Project (Project). The Route Permit Application is being made under the Alternative Permitting processes of Minnesota Rules 7849.5500 to 7849.5720 (2007).

The Project is located in the Townships of Wisconsin, Petersburg, and Des Moines and the City of Jackson in Jackson County, Minnesota. The application details Northstar's need for approximately 10 miles of 161 kV transmission line, a substation in Petersburg Township, and a switching station in the City of Jackson. The Project would capture energy generated by the Northstar Wind Farm, located in Emmet and Dickinson Counties, Iowa, and connect to the NSP/Xcel Energy Lakefield Jct-Fox Lake 161 kV transmission line east of the City of Jackson.

A check in the amount of \$6,250 made payable to the Department of Commerce related to the Route Permit Application (25% of the estimated total route permit fee, as required by Minnesota Rules 7849.5210 and Minnesota Statute Section 216E.18) has been submitted to the Department of Commerce by mail.

Pursuant to Minnesota Rules 7849.5240, the permittee must, within 15 days, provide notice (to the persons listed in subpart 2 of that rule) that the Route Permit Application has been submitted. To assist us in making the required notice, please immediately provide the undersigned with the list of persons whose names are on the general list maintained by the Minnesota Public Utilities Commission.

Sincerely,
Tetra Tech EC, Inc.

A handwritten signature in black ink that reads "Rebecca Longley".

Rebecca Longley
Project Manager

Enclosure: Route Permit Application



133 Federal Street, 6th Floor, Boston, MA 02110
Tel 617.457.8200 Fax 617.457.8498/8499
www.tteci.com

Table of Contents

1.0	SUMMARY OF PROPOSED PROJECT.....	1
2.0	ALTERNATIVE PERMITTING PROCESS – PROJECT ELIGIBILITY	1
2.1	Alternative Permitting Process Submission Requirements Checklist.....	3
2.2	Notification of Local Units of Government.....	7
2.3	Certificate of Need.....	7
2.4	Notice to the Commission.....	8
3.0	OWNERSHIP	8
3.1	Permittee/Contact Information.....	8
3.2	Project Location.....	8
3.3	Proposed Project	9
3.4	Schedule.....	10
4.0	DETAILED FACILITY DESCRIPTION AND ROUTE DEVELOPMENT PROCESS	11
4.1	Proposed Transmission Line Route Description.....	11
4.2	Proposed Substation Description	11
4.3	Proposed Switching Station	11
4.4	Route and Substation Site Location Rationale.....	12
4.5	Design Options	12
4.5.1	Transmission Structures.....	12
4.5.1.1	Rights-of-Way Acquisition	15
4.5.2	Electric and Magnetic (EMF) Fields.....	20
4.5.2.1	Electric Fields.....	20
4.5.2.2	Magnetic Fields.....	21
4.5.2.3	Stray Voltage.....	22
4.5.2.4	Farming Operations Vehicle Use and Buildings near Power Lines.....	22
5.0	CONSTRUCTION RESTORATION AND MAINTENANCE METHODS	23
5.1	Transmission Construction Procedures.....	23
5.2	Restoration Procedures	24
5.3	Maintenance Procedures	25
5.4	Estimated Project Costs	25
5.5	List of Permits.....	25
5.5.1	Federal Permits	26
5.5.2	State Permits	26
5.5.3	County Permits	27
5.5.4	Local Permits	27
6.0	ENVIRONMENTAL INFORMATION.....	27
6.1	Environmental Setting	27
6.2	Human Settlement Impacts.....	28
6.2.1	Public Health and Safety.....	28
6.2.2	Land Use, Land Acquisition and Landowner Displacement	28
6.2.3	Noise.....	29
6.2.4	Aesthetics.....	30
6.2.5	Socioeconomic Impacts	31
6.2.6	Cultural Values	33
6.2.7	Recreation	34
6.2.8	Public Services.....	36

Table of Contents - continued

6.3	Land-Based Economic Impacts	36
6.3.1	Agriculture.....	36
6.3.2	Forestry.....	37
6.3.3	Tourism.....	37
6.3.4	Mining.....	37
6.4	Archaeological and Architectural History Resources.....	37
6.4.1	Background Research and Literature Review.....	38
6.4.2	Potential Archaeological Resource Impacts	41
6.4.3	Potential Architectural Resource Impacts.....	41
6.5	Natural Environment.....	41
6.5.1	Air Quality	41
6.5.2	Water Quality.....	41
6.5.3	Flora and Fauna	48
6.6	Rare and Unique Resources.....	50
7.0	AGENCY AND PUBLIC CONTACTS	52
7.1	Agency Contacts	52
7.1.1	Minnesota Department of Natural Resources.....	52
7.1.2	Jackson County	52
7.1.3	Minnesota State Historic Preservation Office (SHPO).....	52
7.1.4	United States Fish and Wildlife Service	52
7.2	Adjacent Landowners	52
8.0	FACTORS TO BE CONSIDERED BY THE COMMISSION	52
8.1	Effects on Human Settlement, Including, But Not Limited to, Displacement, Noise, Aesthetics, Cultural Values, Recreation, and Public Services.....	52
8.2	Effects on Public Health and Safety	53
8.3	Effects on Land-based Economies, Including, but not limited to, Agriculture, Forestry, Tourism, And Mining	53
8.4	Effects on Archaeological and Historic Resources.....	53
8.5	Effects on the Natural Environment, Including Effects on Air and Water Quality Resources and Flora and Fauna	54
8.6	Effects on Rare and Unique Natural Resources.....	54
8.7	Application of Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and Could Accommodate Expansion of Transmission or Generating Capacity	55
8.8	Use or Paralleling of Existing Rights-Of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries.....	55
8.9	Use of Existing Large Electric Power Generating Plant Sites	55
8.10	Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-Of-Way	55
8.11	Electrical System Reliability.....	55
8.12	Costs of Constructing, Operating, and Maintaining the Facility which are Dependent on Design and Route.....	55
8.13	Adverse Human and Natural Environmental Effects which cannot be Avoided.....	56
8.14	Irreversible and Irretrievable Commitments of Resources	56

Table of Contents - continued**Tables**

Table 2-1	Alternative Permitting Process Submission Requirements Checklist.....	3
Table 3-1	Proposed Project Location	8
Table 4-1	Structure Design Summary	15
Table 4-2	Calculated Electric Fields (KV/M) for the Proposed 161 KV Transmission Line at 1 meter (3.28 feet) above ground	20
Table 4-3	Calculated Magnetic Flux Density (milligauss) for Proposed 161 kV Transmission Line (3.28 feet above ground)	22
Table 5-1	List of Potential Required Permits Permit Description Jurisdiction	26
Table 6-1	Common Noise Levels.....	29
Table 6-2	Rule 7030.0040 Noise Area Classifications	30
Table 6-3	Population and Economic Characteristics	32
Table 6-4	Architectural Properties located within one mile of Proposed Project	39
Table 6-5	Wetlands and Public Waters Summary Table	46
Table 6-6	Wildlife Species	49
Table 6-7	Rare and Unique Resources Potentially Occurring Near the Proposed Project Area	50
Table 8-1	Minnesota DNR Species Recorded Within One Mile Radius of the Project Route	54

Figures

Figure 1	Proposed Project Route.....	2
Figure 2	Typical Tangent Structure Northstar Transmission Line Northstar Transmission, LLC Jackson County, MN September 2008.....	13
Figure 3	Typical Double Circuit Davit Arm Structure Northstar Transmission Line Northstar Transmission, LLC Jackson County, MN September 2008.....	14
Figure 4	161 kV Line Adjacent to County Highway 25	16
Figure 5	161 kV Line Adjacent to Township Roads.....	17
Figure 6	161 kV Line on Private Property North of County Highway 14	18
Figure 7	161 kV Line Double Circuit along Xcel Transmission Line	19
Figure 8	Recreational Facilities.....	35
Figure 9	Wetlands and Protected Water Tile 1 of 2.....	43
Figure 9	Wetlands and Protected Water Tile 2 of 2.....	44

Appendices

Appendix A	List of Landowners
Appendix B	Municipalities Correspondence
Appendix C	Public Utility Commission Notification Letter
Appendix D	State Historic Preservation Office Correspondence
Appendix E	Natural Resource Agency Correspondence

1.0 SUMMARY OF PROPOSED PROJECT

Northstar Transmission, LLC, a Delaware limited liability company (the Applicant) is submitting this application for a 161 kilovolt (kV) high voltage transmission line to the Minnesota Public Utilities Commission (PUC) as required by Minnesota Rules (Minn Rules) Chapter 7849 and Minnesota Statutes (Minnesota Statutes) Chapter 216E. The proposed Northstar transmission line and associated facilities (Proposed Project or Project) for which a permit is being requested include:

- A new approximate 10-mile 161 kilovolt (kV) transmission line to capture energy generated by the Northstar Wind Farm located in Emmet and Dickinson Counties, Iowa to existing transmission facilities near Jackson, Minnesota.
- The proposed Tatman Project Substation¹ in Petersburg Township, Minnesota; and
- Possibly a new switching station on 790th Street, east of Jackson, Minnesota.

Northstar Transmission, LLC is currently in the process of evaluating two alternative points of interconnection (POI) as POI Option 1 and POI Option 2 (see Figure 1). POI Option 1 would interconnect the proposed transmission line to the new Jackson Substation, which is located north of the City of Jackson and is currently under construction. POI Option 2 would interconnect the proposed transmission line to a pole on an existing transmission line currently owned by Xcel Energy about one mile east of the City of Jackson and would require construction of a new switching station near the point of interconnection.

2.0 ALTERNATIVE PERMITTING PROCESS – PROJECT ELIGIBILITY

The proposed Northstar Transmission Line Project meets the qualifications for alternative permitting defined in Minn. Rules 7849.5500, subp.1.C, since it includes a high voltage transmission line (HVTL) between 100 and 200 kV. Therefore, this permit application has been prepared in conformance with PUC alternative permit application requirements (see Section 2.1).

¹ The Proposed Tatman Project Substation was formerly identified as the Minowa Substation during the Midwest Independent System Operator (MISO) Interconnection Request.

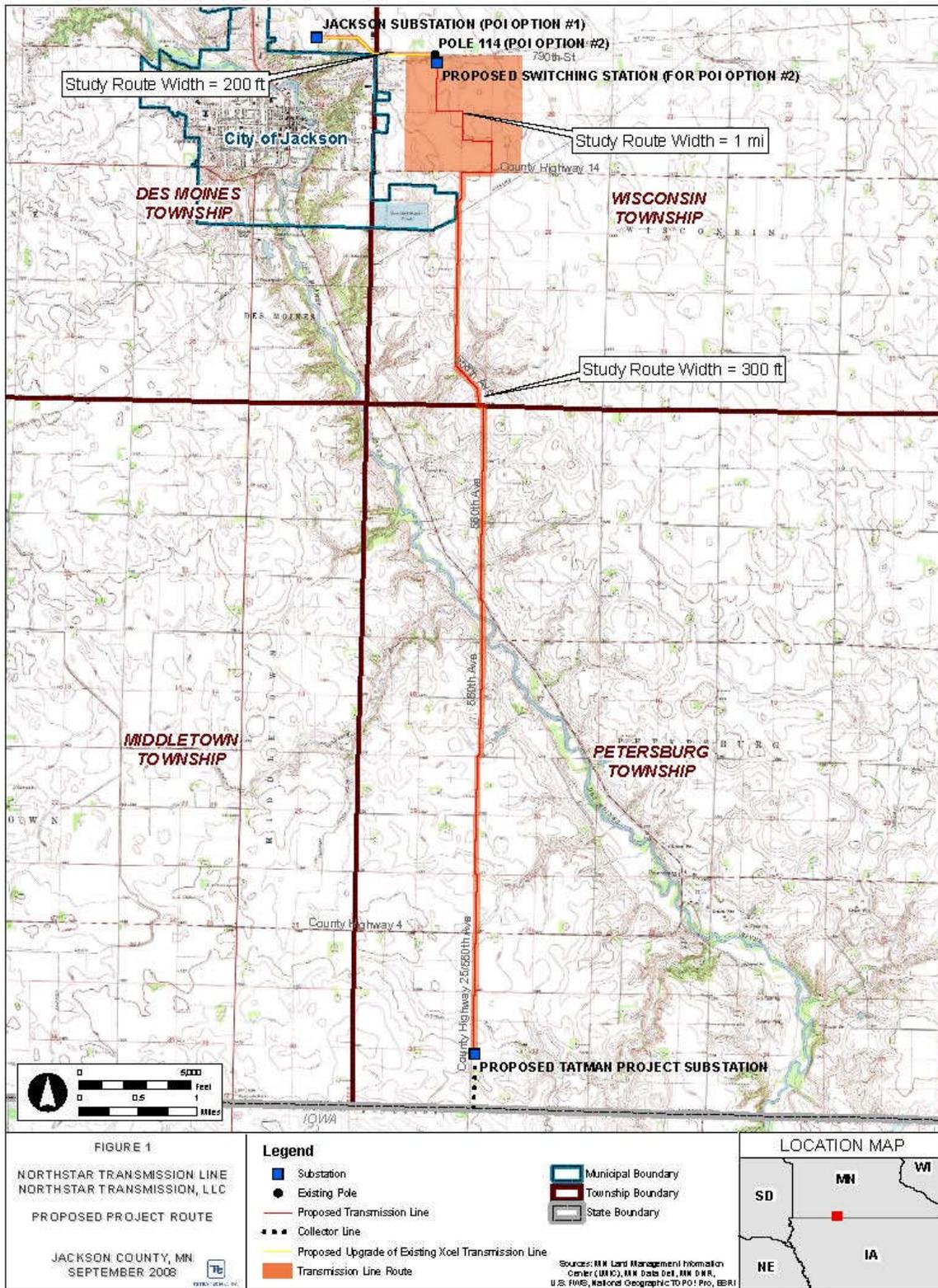


Figure 1 Proposed Project Route

2.1 Alternative Permitting Process Submission Requirements Checklist

Table 2-1 lists the PUC permit requirements for the alternative permitting process, and the locations in this permit application where the required information can be found.

**Table 2-1
Alternative Permitting Process Submission Requirements Checklist**

Rule/Statute	Information Required	Location in Permit Application
Minn. R. 7849.5500, Subp. 1(C)	Subpart 1. Eligible Projects. An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7849.5500 to 7849.5720 instead of the full permitting procedures in parts 7849.5200 to 7849.5340: high voltage transmission lines between 100 and 200 kV	Section 2.1
Minn. R. 7849.5500, Subp. 2.	Subpart 2. Notice to COMMISSION. An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7849.5500 to 7849.5700, shall notify the Commission of such intent, in writing, at least 10 days before submitting an application for the project.	Section 2.4 and Appendix C
Minn. R. 7849.5530	Contents of Application (alternative permitting process) The applicant shall include in the application the same information required in part 7849.5220, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them	Section 4.0; also see Minn. Rules 7849.5220, Subp.2 entry in this table
Minn. R. 7849.5220, Subp. 2 (applicable per Minn. R. 7849.5530)	Route Permit for High Voltage Transmission Line (HVTL) (a) a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	Section 3.1
	(b) the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated	Section 3.1
	(c) at least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference	Not applicable (Minn. Rules 7849.5530) Section 4.0
	(d) a description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line	Sections 3.3 and 4.0
	(e) the environmental information required under 7849.5220, Subp. 3	See Minn. Rules 7849.5220, Subp.3 (a) – (h) entry in this table
	(f) identification of land uses and environmental conditions along the proposed routes	Section 6.0
	(g) the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix A
	(h) United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes	Figure 1

Rule/Statute	Information Required	Location in Permit Application
	(i) identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way with the proposed line	Sections 4.5.1.1, 6.2.2, and 8.8
	(j) the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line	Section 4.0
	(k) cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route	Section 5.4
	(l) a description of possible design options to accommodate expansion of the high voltage transmission line in the future	Section 4.5
	(m) the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line	Sections 5.1 through 5.4
	(n) a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	Section 5.5
	(o) a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required	Section 2.3
Minn. R. 7849.5220, Subp. 3	Environmental Information (a) a description of the environmental setting for each site or route	Section 6.1
	(b) a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services	Section 6.2
	(c) a description of the effects of the facility on land based economies, including, but not limited to, agriculture, forestry, tourism, and mining	Section 6.3
	(d) a description of the effects of the facility on archaeological and historic resources	Section 6.4
	(e) a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna	Section 6.5
	(f) a description of the effects of the facility on rare and unique natural resources	Section 6.6
	(g) identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	Sections 6.2 through 6.6, Mitigation sections, and 8.13
	(h) a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items (a) to (g) and the estimated costs of such mitigative measures	Sections 5.4, and 6.2 through 6.6 Cost of mitigation measures has been covered in a cost contingency

Rule/Statute	Information Required	Location in Permit Application
Minn. R. (7849.5240, Subp. 2 (applicable per Minn. R. 7849.5550))	Notice of Project Notification to persons on Commission's general list, to local officials, and to property owners	Will be mailed to required recipients within 15 days of application submission
Minn. R. 7849.5240, Subp. 4	Publication of notice in a legal newspaper of general circulation in each county in which the route is proposed to be located.	Will be published within 15 days of application submission
Minn. R. 7849.5240, Subp. 5	Confirmation of notice by affidavits of mailing and publication with copies of the notices	Will be submitted within 30 days of notice mailing/publication
Minn. R. 7849.5910	Factors to be Considered in Permitting a HVTL	
	(a) effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services	Section 8.1
	(b) effects on public health and safety	Section 8.2
	(c) effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	Section 8.3
	(d) effects on archaeological and historic resources	Section 8.4
	(e) effects on the natural environment, including effects on air and water quality resources and flora and fauna	Section 8.5
	(f) effects on rare and unique natural resources	Section 8.6
	(g) application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity	Section 8.7
	(h) use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries	Section 8.8
	(i) use of existing large electric power generating plant sites	Section 8.9
	(j) use of existing transportation, pipeline, and electrical transmission systems or rights-of-way	Section 8.10
	(k) electrical system reliability	Section 8.11
	(l) costs of constructing, operating, and maintaining the facility which are dependent on design and route	Section 8.12
	(m) adverse human and natural environmental effects which cannot be avoided	Section 8.13
(n) irreversible and irretrievable commitments of resources	Section 8.14	
Minn. R. 7849.5930, Subs. 1 and 2	Prohibited Routes Wilderness areas. No high voltage transmission line may be routed through state or national wilderness areas Parks and natural areas. No high voltage transmission line may be routed through state or national parks or state scientific and natural areas unless the transmission line would not materially damage or impair the purpose for which the area was designated and no feasible and prudent alternative exists. Economic considerations alone do not justify use of these areas for a high voltage transmission line	Not applicable – No impacts, see Section 6.2.7

Rule/Statute	Information Required	Location in Permit Application
Minn. Stat. §216E.03 Subd. 7(b) (applicable per Minn. Stat. §216E.04, Subd. 8)	Considerations in designating sites and routes (1) Evaluation of research and investigations relating to the effects on land, water and air resources of large electric power, generating plants and high voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including baseline studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment	Sections 4.5.2, 5.4, 6.2.1, 6.2.4, 6.5.1, 6.5.2, 6.5.3, and 6.6
	(2) Environmental evaluation of sites and routes proposed for future development and expansion and their relationship to the land, water, air and human resources of the state	Sections 4.4 and 8.7
	(3) Evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants transmission - designed to minimize adverse environmental effects	Not required for/applicable to transmission projects
	(4) Evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants	Not required for/applicable to transmission projects
	(5) Analysis of the direct and indirect economic impact of proposed sites and routes including, but not limited to, productive agricultural land lost or impaired	Sections 6.2.5 and 6.3
	(6) Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted	Sections 6.2 through 6.6, Mitigation sections, 8.1 through 8.6, and 8.13
	(7) Evaluation of alternatives to the applicant's proposed site or route proposed pursuant to subdivisions 1 and 2	Not required for alternative process
	(8) Evaluation of potential routes that would use or parallel existing railroad and highway rights-of way	Sections 4.5.1.1, 6.2.2, and 8.8
	(9) Evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations	Section 6.3.1
	(10) Evaluation of the future needs for additional high voltage transmission lines in the same general area as any proposed route, and the advisability of ordering the construction of structures capable of expansion in transmission capacity through multiple circuiting or design modifications	Sections 4.4 and 8.7
	(11) Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved	Section 8.14
	(12) When appropriate, consideration of problems raised by other state and federal agencies and local entities	Section 7.1

2.2 Notification of Local Units of Government

In accordance with Amendment 216C found in Minnesota Session Laws 2008, Chapter 296 an Applicant must notify local units of government 90 days prior to filing a route permit application, as so stated in the following:

Subd. 3a. **Project notice.** At least 90 days before filing an application with the commission, the Applicant shall provide notice to each local unit of government within which a route may be proposed. The notice must describe the proposed project and the opportunity for a preapplication consultation meeting with local units of government as provided in subdivision 3b.

EFFECTIVE DATE. This section is effective September 1, 2008.

Northstar Transmission, LLC has identified the local units of government where the transmission line will traverse as:

- Jackson County (for occupying right-of-way along County Highway 25 and crossing County Highways 4 and 14)
- Petersburg Township (for occupying right-of-way along 560th Avenue and private property)
- Wisconsin Township (for occupying right-of-way along 558th Avenue and private property)
- Des Moines Township (for occupying right-of-way along the Xcel transmission line route)
- City of Jackson (for occupying right-of-way along the Xcel transmission line route)

In anticipation of securing permits and to discuss the construction and operation of the Northstar Transmission Line Project, personnel from Emmet County Energy, LLC contacted Gordon Olson, Director of Jackson County Planning Commission in April 2008 and met with Mr. Olson, Jackson County Highway Engineer, Jackson County Highway Supervisor on May 7, 2008. Mr. Olson confirmed the notification of that governmental unit via letter (see Appendix B).

Emmet County Energy, LLC contacted Wisconsin Township during the first week of July and met on July 14th. A letter confirming the meeting was sent by Mr. Russell Winter, Trustee for Wisconsin Township (see Appendix B).

Emmet County Energy, LLC also contacted Petersburg Township Trustees during the first week of July and met on the evening of July 10th. Mr. Van Johnson, Trustee for Petersburg Township sent a letter confirming this notification (see Appendix B).

The Applicant entered into discussions with Xcel in the early stages of Project development. Although Xcel identified the proposed Jackson Substation as a point of interconnection, the Applicant pursued an alternative Point of Interconnection at Pole 114. That is the reason that the communities along the Xcel transmission from pole 114 to the Jackson Substation were not contacted in the early stages of Project development. On October 7th, Mark Goede, Chairman of the Des Moines Township Board of Trustees was contacted and a letter was sent on October 8 (see Affidavit of Alan Blum para. 2-4, Appendix B). On October 7th, Dean Albrecht, Administrator for the City of Jackson was contacted and a letter was sent on October 8th (see Affidavit of Alan Blum, para. 3-4, Appendix B).

2.3 Certificate of Need

A Certificate of Need (CON) for a 'large energy facility' (see Minn Statutes Section 216B.243, Subd. 2) must be issued by the PUC prior to Project construction. The proposed 161 kV transmission line could be greater than 10 miles long if the Project includes POI Option #1; and therefore, could be classified as a 'large energy facility' as defined in Minnesota Statutes Section 216B.2421, Subd. 2(3). Therefore a CON

will be filed and the Notice Plan Approval Request was filed on August 6th, 2008 (Docket Number IPP6686/CN-08-944) for the Proposed Project.

2.4 Notice to the Commission

The Applicant notified the PUC of its intent to use the Alternative Permitting Process for the Proposed Project. The notification letter (see Appendix C), dated September 22, 2008 complies with the requirement for applicants to notify the PUC at least 10 days prior to submission of an application.

3.0 OWNERSHIP

3.1 Permittee/Contact Information

The Northstar Wind Farm is being developed by Emmet County Energy, LLC, a community-owned wind energy development company, and Edison Mission Group, a subsidiary of Edison International. Emmet County Energy was formed in 2006 by a group of landowners to ensure that a substantial amount of the benefits from the region’s wind potential stayed within the local community. National Wind, LLC, the country’s largest developer of community owned wind farms, is a partner of Emmet County Energy.

Northstar Transmission, LLC, will own and operate the 161 kV transmission line Project that is the subject of this application. Following is contact information for Northstar Transmission, LLC:

Alan Blum
alan.blum@blumandleonard.com
 Northstar Transmission, LLC
 418 Central Ave.
 Esterville, IA 51334
 712-362-7272

Northstar Transmission’s proposed transmission line will connect Emmet County Energy’s Northstar Wind Farm to existing transmission facilities near Jackson, Minnesota, that can deliver the wind power to Minnesota customers. The long term maintenance will be performed by the Northstar Transmission, LLC or a third party contracted by Northstar Transmission, LLC. Emmet County Energy is the sole affiliate and 100 percent owner of Northstar Transmission.

3.2 Project Location

The Proposed Project is located in the Townships of Wisconsin, Petersburg, Des Moines and the City of Jackson in Jackson County, Minnesota (see Figure 1). The township, range and section locations within the proposed Project area are summarized in Table 3.1.

**Table 3-1
 Proposed Project Location**

SECT	TOWN	TDIR	RANG	RDIR	TWPRNGSEC	Label
13	102	N	35	W	10203513	S13 - T102N - R35W
18	102	N	34	W	10203418	S18 - T102N - R34W
19	102	N	34	W	10203419	S19 - T102N - R34W
20	102	N	34	W	10203420	S20 - T102N - R34W
30	102	N	34	W	10203430	S30 - T102N - R34W
29	102	N	34	W	10203429	S29 -T102N - R34W
31	102	N	34	W	10203431	S31 - T102N - R34W
32	102	N	34	W	10203432	S32 - T102N - R34W
6	101	N	34	W	10103406	S6 - T101N - R34W

SECT	TOWN	TDIR	RANG	RDIR	TWPRNGSEC	Label
5	101	N	34	W	10103405	S5 - T101N - R34W
7	101	N	34	W	10103407	S7 - T101N - R34W
8	101	N	34	W	10103408	S8 - T101N - R34W
18	101	N	34	W	10103418	S18 - T101N - R34W
17	101	N	34	W	10103417	S17 - T101N - R34W
19	101	N	34	W	10103419	S19 - T101N - R34W
20	101	N	34	W	10103420	S20 - T101N - R34W
30	101	N	34	W	10103430	S30 - T101N - R34W
29	101	N	34	W	10103429	S29 - T101N - R34W
31	101	N	34	W	10103431	S31 - T101N - R34W
32	101	N	34	W	10103432	S32 - T101N - R34W

The Proposed Project starts at the Tatman Project Substation near the Minnesota-Iowa border within a nine-acre parcel of land that was used for agricultural purposes. The transmission line originates from this substation and is located along County Highway 25 (560th Avenue) from the proposed Tatman Substation to the intersection of County Highway 4, a distance of one mile. From County Highway 4 north, the transmission line is located along 560th and 558th Avenues, which are township roads in Petersburg and Wisconsin Townships, for a distance of six miles. Along this stretch of the Project route, Federated Rural Electric Administration (REA) owns local distribution lines. The Applicant will work with the REA to bury the REA's lines or underbuild REA's lines on the Project's transmission structures. The study route for this portion of the Project includes the nine-acre substation parcel and a transmission route extending 150 feet to the east or west of the centerline of the roads for a total distance of 300 feet.

From County Highway 14, the transmission line traverses private agricultural property in a general southeast to northwest alignment to the proposed switching station. If POI #2 is chosen, the line will terminate at the switching station which would be located on a two-acre parcel of private property. The study route in this location is generally one mile in width.

Xcel Energy is currently in negotiations to sell a portion of a 161 kV line known as Lakefield Junction to Fox Lake. Both Xcel Energy and the potential purchaser have expressed a desire for the Northstar Transmission Line to be co-located onto single pole structures from pole 114 of the Lakefield Junction to Fox Lake transmission line to the new Jackson Substation currently under construction (i.e., POI #1) for a distance of approximately one mile. Northstar Transmission, LLC is currently negotiating the agreements necessary to achieve this goal. The study route between pole 114 and the Jackson Substation is 200 feet wide, which includes Xcel Energy's existing 80-foot transmission line ROW plus another 120 feet of land to the north of Xcel's ROW.

3.3 Proposed Project

The Applicant proposes to construct the Northstar 161 kV transmission line, Tatman Project Substation, and switching station in Jackson County, Minnesota along existing roadway ROW and private property, consistent with the PUC routing recommendations for ROW sharing. Section 4.5.1.1 describes the licenses and easements necessary to acquire the rights to construct the Proposed Project. The Proposed Project would be constructed to capture energy generated by the Northstar Wind Farm, a 200 megawatt (MW) facility located in Emmet and Dickinson Counties, Iowa, and connect to the NSP/Xcel Energy Lakefield Jct-Fox Lake 161 kV transmission line just east of Jackson, Minnesota. The Project area includes the townships of Petersburg, Wisconsin and Des Moines, and the City of Jackson.

The proposed Tatman Project Substation in Petersburg Township, Minnesota would occupy approximately 2.5 acres in the northwest corner of a nine acre parcel currently used by the Jack Tatman Trust for agricultural purposes. A 34.5 kV underground collector line would be constructed by the wind farm developer and would run cross-country from the Northstar Wind Farm collector system in Iowa. The 161/34.5 kV substation will be designed to accommodate the incoming 34.5 kV collector line and the outgoing 161 kV line. The substation design has not been completed at this time but will generally include the following components:

- Circuit breakers;
- High voltage switches;
- Steel structures to support the high voltage bus, switches and other miscellaneous equipment;
- Surge arresters;
- Ground grid;
- Power and control cable;
- Control building;
- Control panels;
- DC battery system;
- AC station power;
- AC and DC station service panels;
- Communication panel;
- Crushed rock used as surfacing of the substation;
- Fencing around the facility, to restrict public access.

The 161 kV transmission line would be located in a general south to north alignment on galvanized or weathered steel, single circuit poles with braced posts at an average height of 75 feet. The structures will be direct embedded, and the distance between each pole (span) will be 400 feet on average. Two 34.5 kV local distribution lines owned by REA may be buried or underbuilt on the Applicant's transmission structures.

The proposed switching station would be located on a 2.5 acre private property on 790th Street, east of Jackson, Minnesota currently used by the Fairland Management Company for active agriculture. The parcel would be acquired by Northstar Transmission, LLC for the facility. The switching station will be designed once the POI has been determined.

3.4 Schedule

Proposed schedule for transmission line, substation and switching station construction:

- Completion of the Interconnection Studies – October 2008
- Completion of land acquisition for the transmission line – November 2008
- Permitting process complete – March 2009
- Start construction of the transmission line –April 2009
- Start construction of the substation – September 2009
- Start construction of the switching station – September 2009
- Completion of required MISO network upgrades – January 2010
- Energize Tatman Project Substation and transmission line – February 2010

4.0 DETAILED FACILITY DESCRIPTION AND ROUTE DEVELOPMENT PROCESS

4.1 Proposed Transmission Line Route Description

This Proposed Project involves constructing a new 161 kV transmission line between the proposed Tatman Project Substation in Petersburg, Minnesota and two alternative points of interconnection (POI) as POI Option 1 and POI Option 2. POI Option 1 would interconnect the proposed transmission line to the new Jackson Substation, which is currently under construction for approximately 10 miles. POI Option 2 would interconnect the proposed transmission line to a pole on an existing transmission line currently owned by Xcel Energy for approximately 9 miles.

The Tatman Project Substation would be located one half mile north of the Minnesota-Iowa border to the east of County Highway 25 on private property. The line would head north out of the substation one mile within the ROW of County Highway 25 to County Highway 4. At County Highway 4, the transmission line is located in the ROW of 560th Avenue for a distance of four and one half miles, and then is located in the ROW of 558th Avenue from the Petersburg-Wisconsin Township boundary to County Highway 14, a distance of two miles. At County Highway 14 the line turns east and follows the south side of the highway for one-quarter mile to the township section line. At the township section line, the transmission line turns north one-quarter mile. The line then turns west along a property line for one-quarter mile, north for one-quarter mile along a property line, west 0.20 mile along a property line, and north one-half mile to the switching station near pole 114 (POI # 2). The switching station would be constructed on a two-acre parcel just south of the Xcel 161 kV transmission line. If the POI is at the Jackson Substation, the transmission line would be collocated on double-circuit pole structures within the Xcel transmission line ROW from pole 114 to the west a distance of one mile to the Jackson Substation (POI #1).

The Proposed Project locates transmission lines for the most part within or directly adjacent to existing utility, roadway or other public ROWs, and it includes power pole sharing with the Xcel Energy transmission line for approximately one mile of the route into the Jackson Substation currently under construction.

4.2 Proposed Substation Description

The proposed Tatman Project Substation would occupy approximately 2.5 acres of the nine acre parcel owned privately. The remainder of the parcel would be available for potential future development or farming operations. The parcel is located just north of the Minnesota-Iowa border on the east side of County Highway 25. A list of the components is presented in Section 3.3.

4.3 Proposed Switching Station

The proposed switching station would be located on a 2.5 acre private property on 790th Street, east of Jackson, Minnesota currently used by the Fairland Management Company for active agriculture. The switching station will be designed once the point of interconnection has been identified. The station will be designed to accommodate the proposed 161 kV lines and will include the following design components:

- 161kV high voltage bus
- 161kV Circuit breakers
- 161kV High voltage switches
- Steel structures to support the high voltage bus, switches, and other misc. equipment
- Surge Arresters

- Ground grid
- Power and control cable
- Control building
 - Control Panels
 - DC battery system
 - AC station power
 - AC & DC station service panels
 - Communication panel
- Instrument transformers for protection and metering
- Control house for the substation control, relaying and communications equipment
- Concrete foundation to support the control house and electrical equipment
- Crushed rock used as surfacing of the switching station.
- Fencing around the entire facility to restrict public access

The 161 kV transmission line will enter the switching station from the south while the existing transmission line will be split at structure #114. The existing transmission line will be rerouted into two separate breaker locations in the switching station.

4.4 Route and Substation Site Location Rationale

The Northstar Wind Farm site was identified in 2005 due to its unique wind resource potential. In 2006, Emmet County Energy filed a MISO interconnection request specifying the Point of Interconnection (POI) at Pole 114 on the 161 kV Lakefield Junction to Fox Lake line that was being built at that time by Xcel Energy. Pole 114 is situated approximately ten miles due north of the center of the wind farm. After Emmet County Energy filed the MISO Interconnection Request known as G614, the City of Jackson and Xcel agreed to construct the Jackson Substation. The Jackson Substation is now under construction. Northstar Transmission, LLC is presently investigating the feasibility of moving G614's POI from Pole 114 to the Jackson Substation.

The Tatman Project Substation parcel was selected because it is due north of the center of the wind farm. This location was chosen to minimize the length of the overhead high voltage transmission line while also minimizing construction costs and line losses.

4.5 Design Options

There are no future design accommodations being made for this transmission line.

4.5.1 Transmission Structures

The structures are proposed to be galvanized or weathered steel, single circuit poles with braced posts (as shown in Figure 2) along County Highway 25, 560th Avenue, 558th Avenue and through private property to the switching station. The conductor on the single circuit line will be 795 ACSR 26/7 'Drake.' The structures will be direct embedded and the distance between each pole (span) will be 400 feet on average as described in Table 4-1. From pole 114 to the Jackson Substation, Northstar Transmission, LLC is currently negotiating collocating the two transmission lines on one single pole structure. The proposed double circuit structures would be galvanized steel poles with davit arms on concrete foundations (see Figure 3).

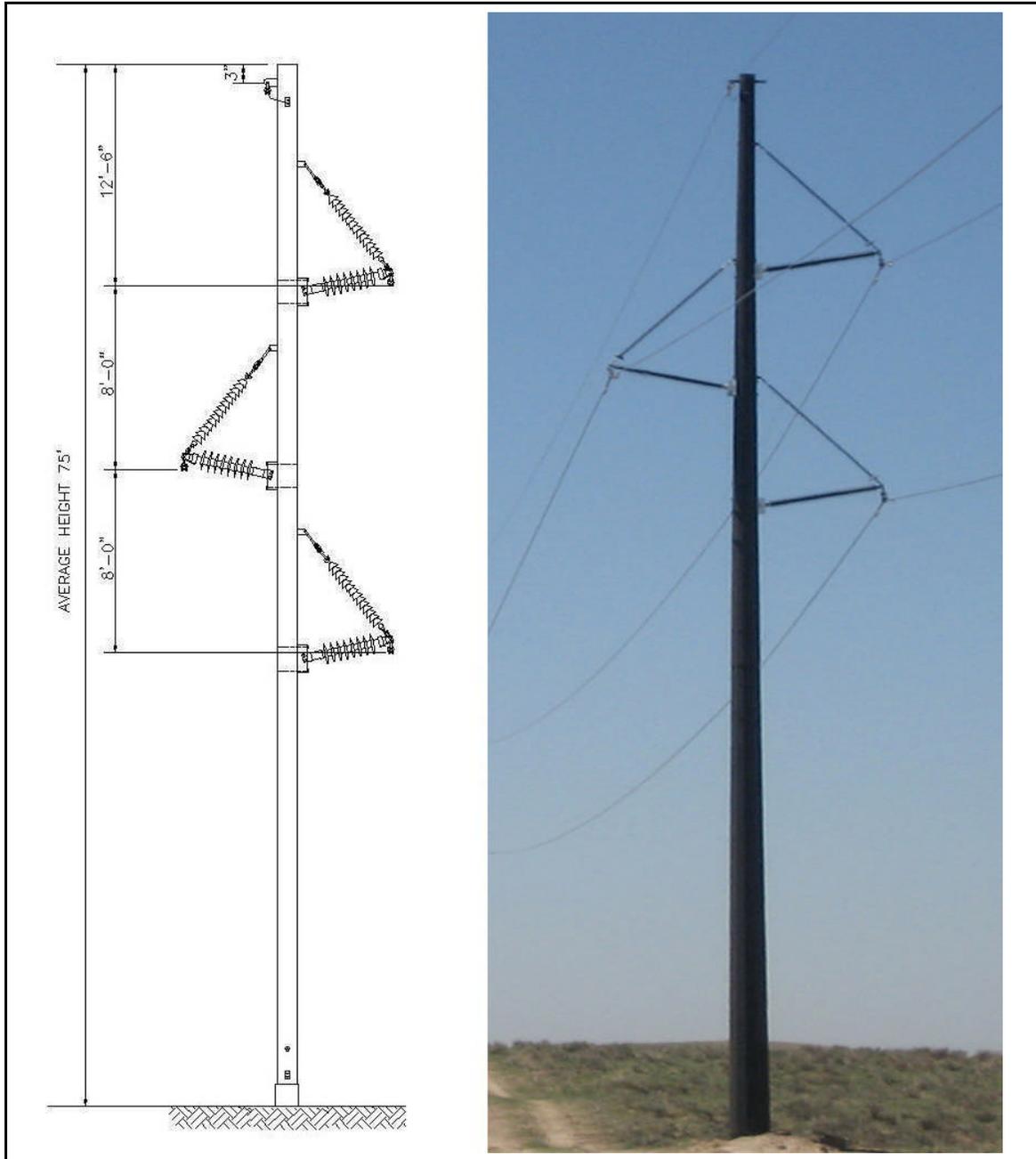


Figure 2
TYPICAL TANGENT
STRUCTURE NORTHSTAR
TRANSMISSION LINE
NORTHSTAR
TRANSMISSION, LLC
JACKSON COUNTY, MN
SEPTEMBER 2008

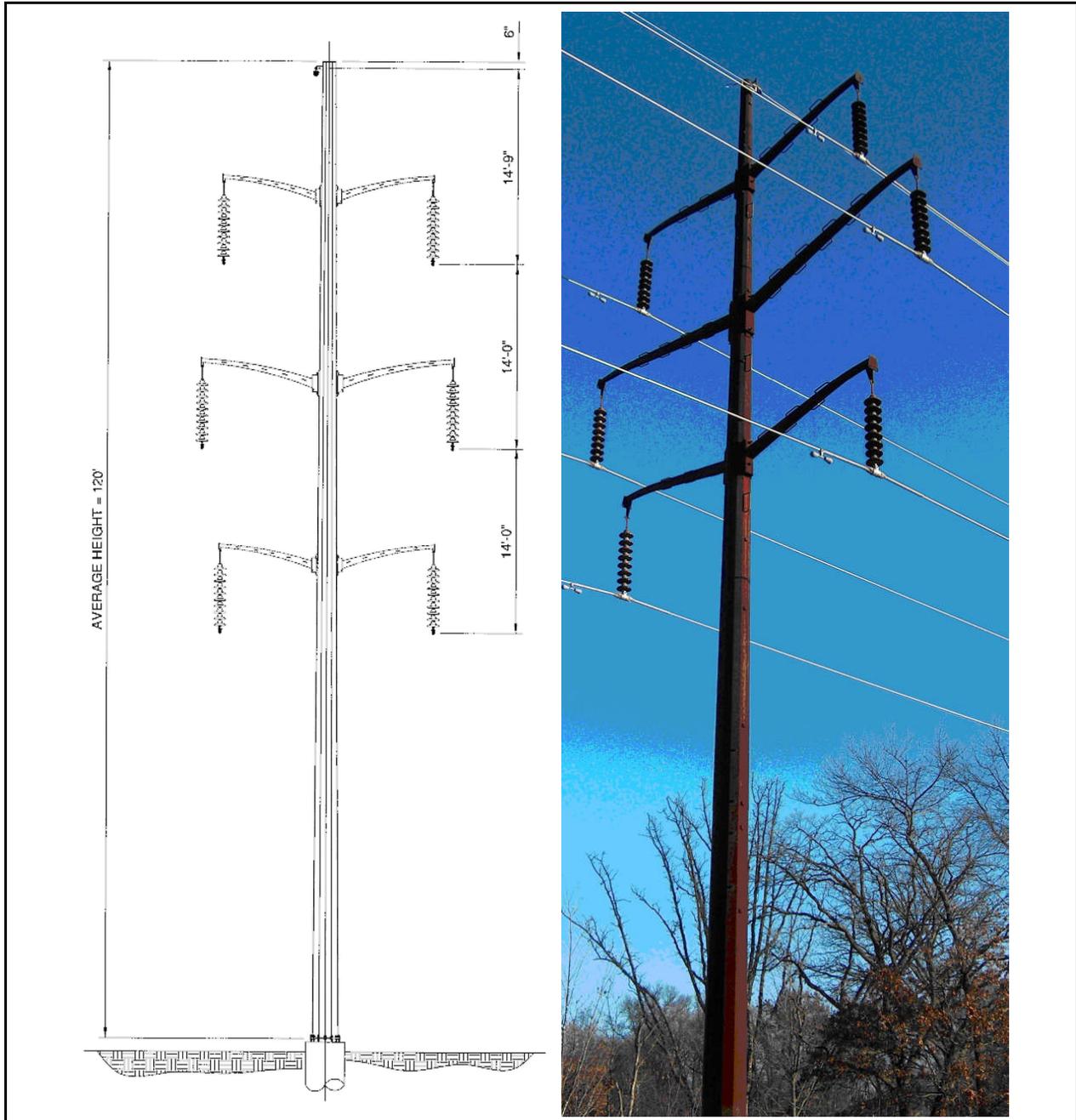


Figure 3
TYPICAL DOUBLE CIRCUIT
DAVIT ARM STRUCTURE
NORTHSTAR
TRANSMISSION LINE
NORTHSTAR
TRANSMISSION, LLC
JACKSON COUNTY, MN
SEPTEMBER 2008

Table 4-1 summarizes the structure design for the lines:

**Table 4-1
Structure Design Summary**

Project Component	Line Voltage	Structure Type	Pole Type	Conductor	Foundation	Double Circuit/Single Circuit	Average Span (feet)	Average Height (feet)	Average Diameter
Single Circuit	161 kV	Braced Posts	Steel	795 ACSR	Direct Embedded	Single	400	75	30"
Double Circuit	161/161 kV	Davit Arm	Steel	795 ACSR	Concrete Foundation	Double	565	110-150	36"

The proposed transmission line will be designed to meet or surpass all relevant local and state codes and North American Electric Reliability Council (NERC). Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during and after installation.

4.5.1.1 Rights-of-Way Acquisition

From Pole 114 to the Jackson Substation (also referred to as POI Option #1), which runs along the existing Xcel Energy transmission line, the proposed study route width is 200 feet. In order to allow the proposed Northstar Transmission Line to interconnect to the Jackson Substation, the existing Xcel Energy transmission line easement is 80 feet wide, and the proposed study route encompasses that 80 feet and then extends 120 feet from the existing easement to the north northeast, away from the City of Jackson. Easements will be negotiated with Xcel.

The proposed Tatman Substation is located on land owned by Jack Tatman. Northstar has an option for nine acres located in the Southwest quarter of Section 32, Township 101 North, Range 34 West of the 5th PM Jackson County. The land adjoins County Highway 25.

The proposed switching station is located on land owned by Fairland Management Co. Northstar Transmission, LLC has an option on two acres located in the North 1/2 of Section 19, Township 102 North, Range 34 West of the 5th PM Jackson County. This site is directly south of the proposed interconnection point to the Xcel line, pole number 114.

The Proposed Project route is located in or adjacent to existing roadway ROWs resulting in minimal impacts that would not affect existing or future use of adjacent parcels. No residential or business displacements would result from the Proposed Project. Specifically, a strip almost eight miles long and 50 feet wide of private property has been acquired for overhang easements from landowners. There will also be a license agreement with Jackson County to occupy a 50-foot wide section of the roadway ROW along County Road 25 for placement of the Project's transmission facilities and a crossing agreement to cross County Highway 4. There will be two license agreements with Petersburg and Wisconsin Townships for a 6-mile long 33-foot section of the roadway ROWs along 560th Avenue and 558th Avenue to County Road 14 for placement of power poles. There will be a license agreement with Jackson County to occupy a 50-foot wide section of the roadway ROW along County Road 14. There will be a 50-foot wide strip of private property for overhang easements from landowners along this road. Figures 4 and 5 depict typical route cross-sections along County Highway 25 and 14 and the Township roads. Figure 6 depicts the typical route cross section from County Highway 14 to pole 114, and Figure 7 depicts the route along the Xcel Transmission Line.

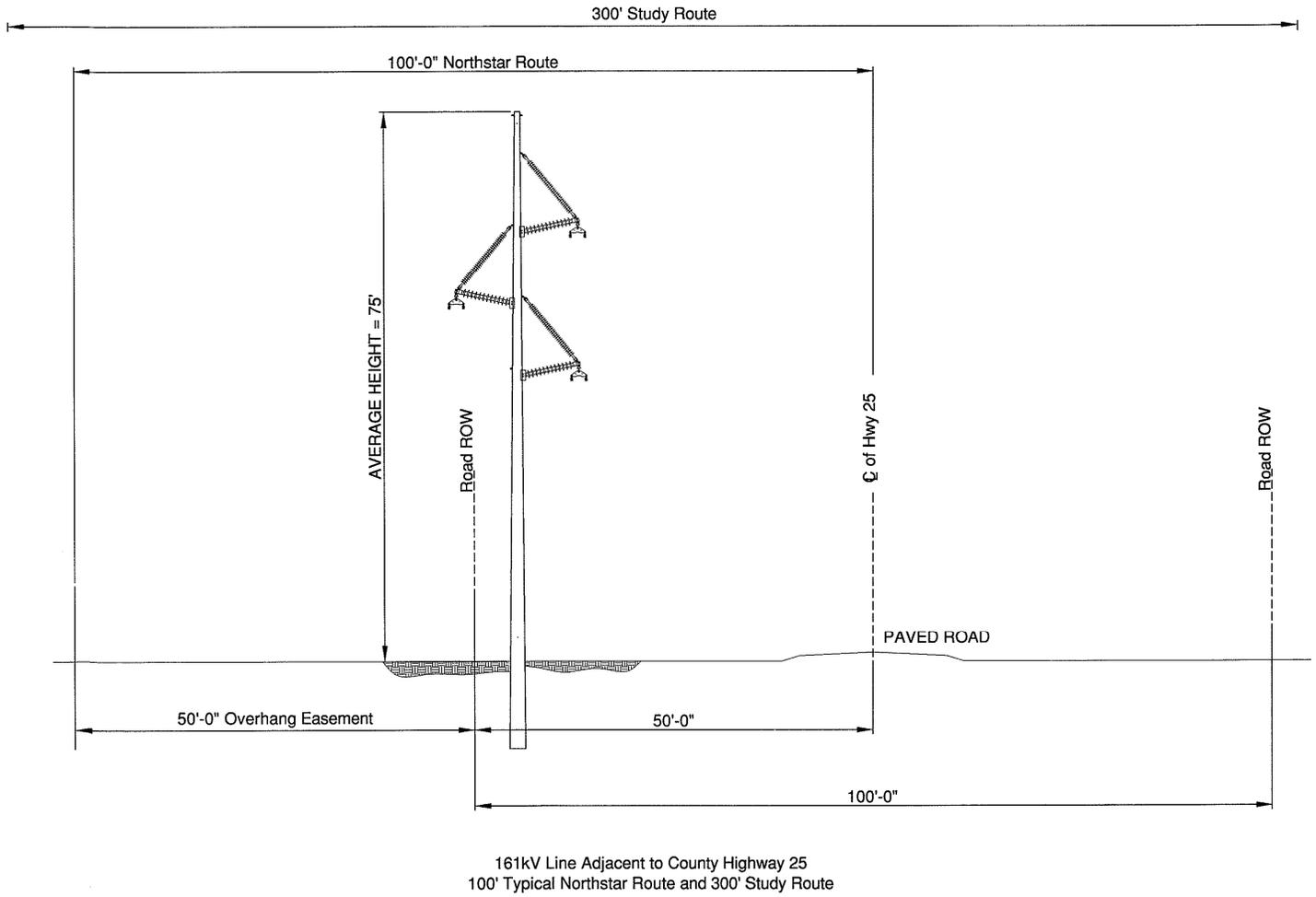


Figure 4 161 kV Line Adjacent to County Highway 25

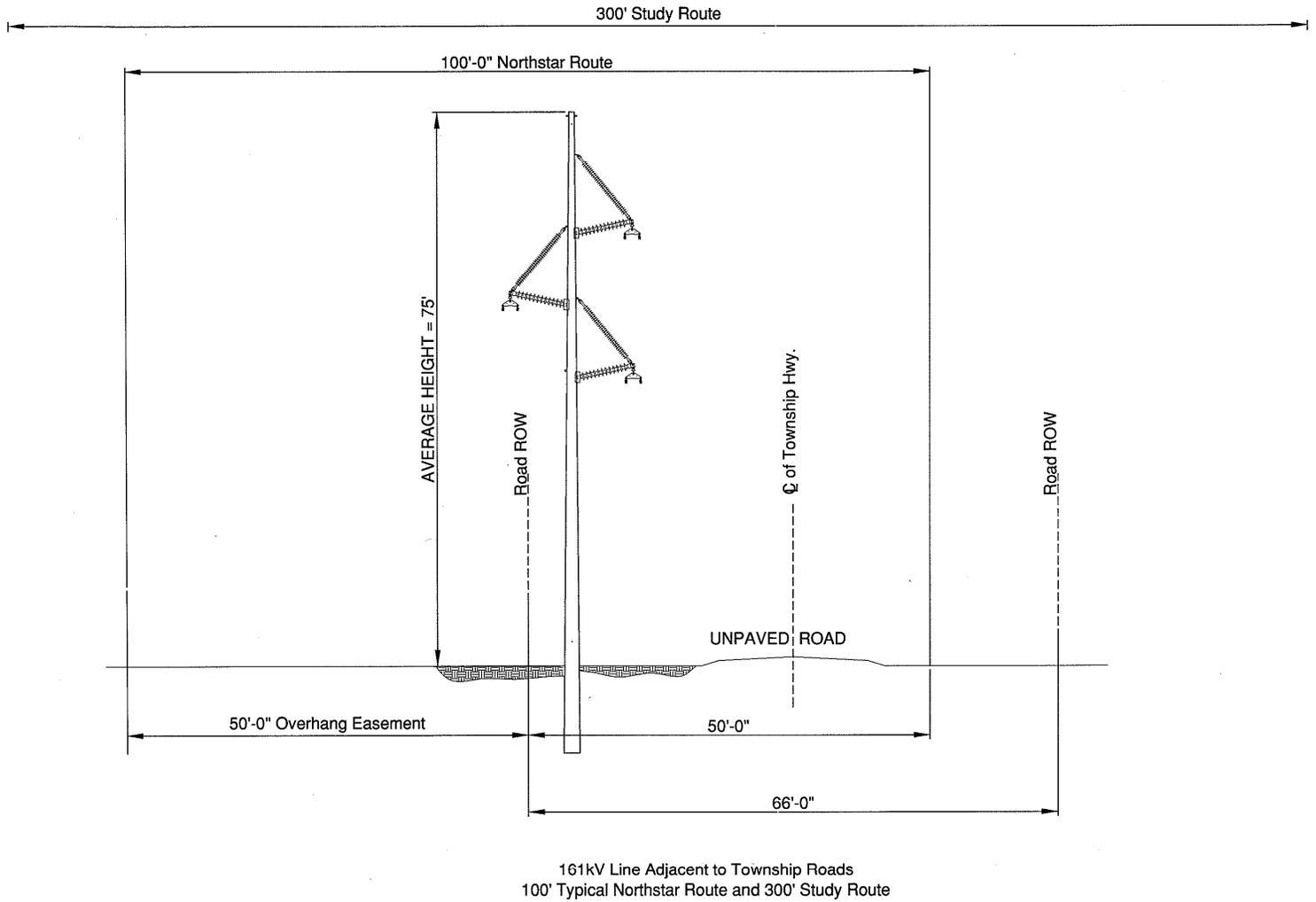


Figure 5 161 kV Line Adjacent to Township Roads

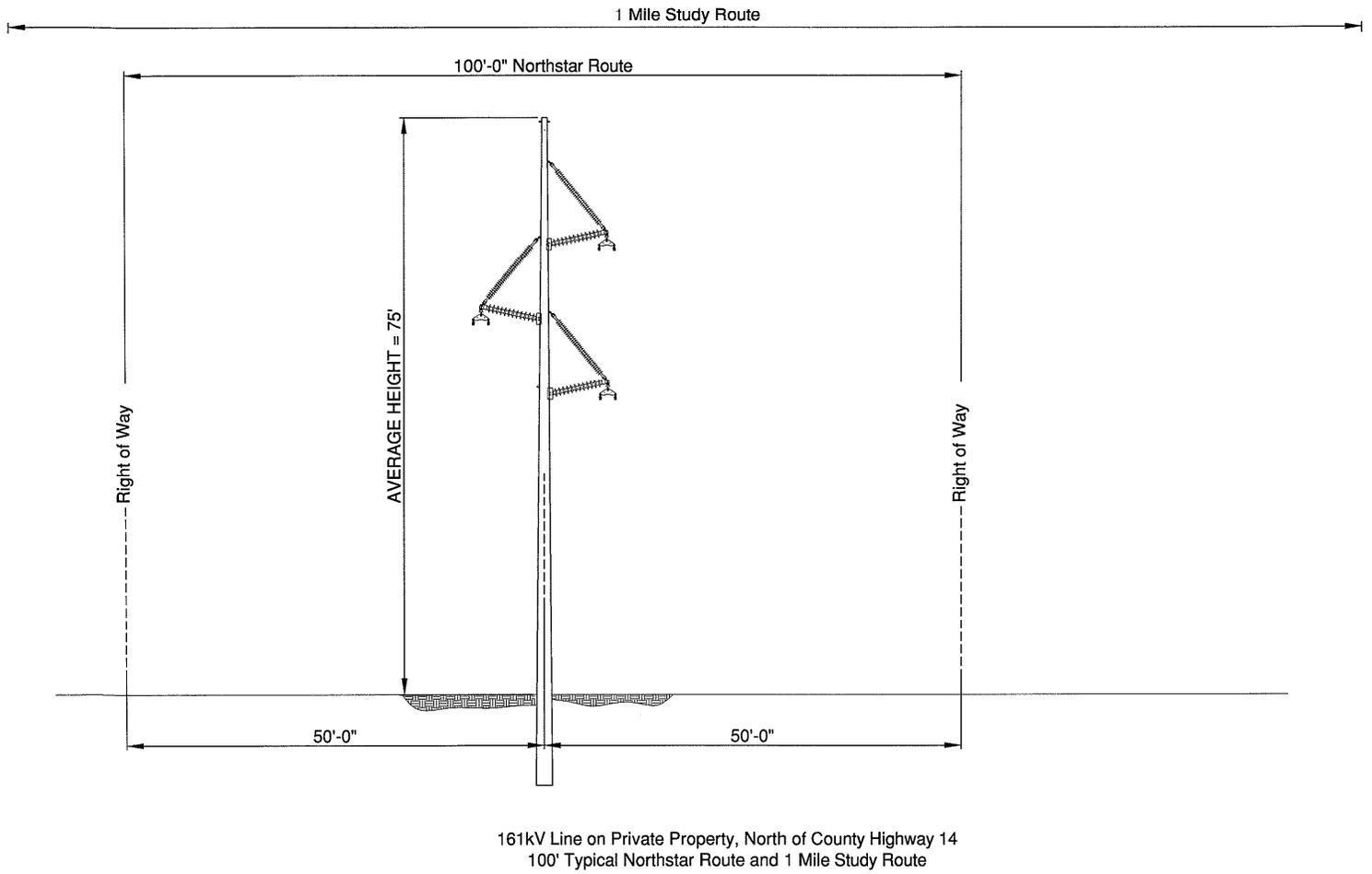
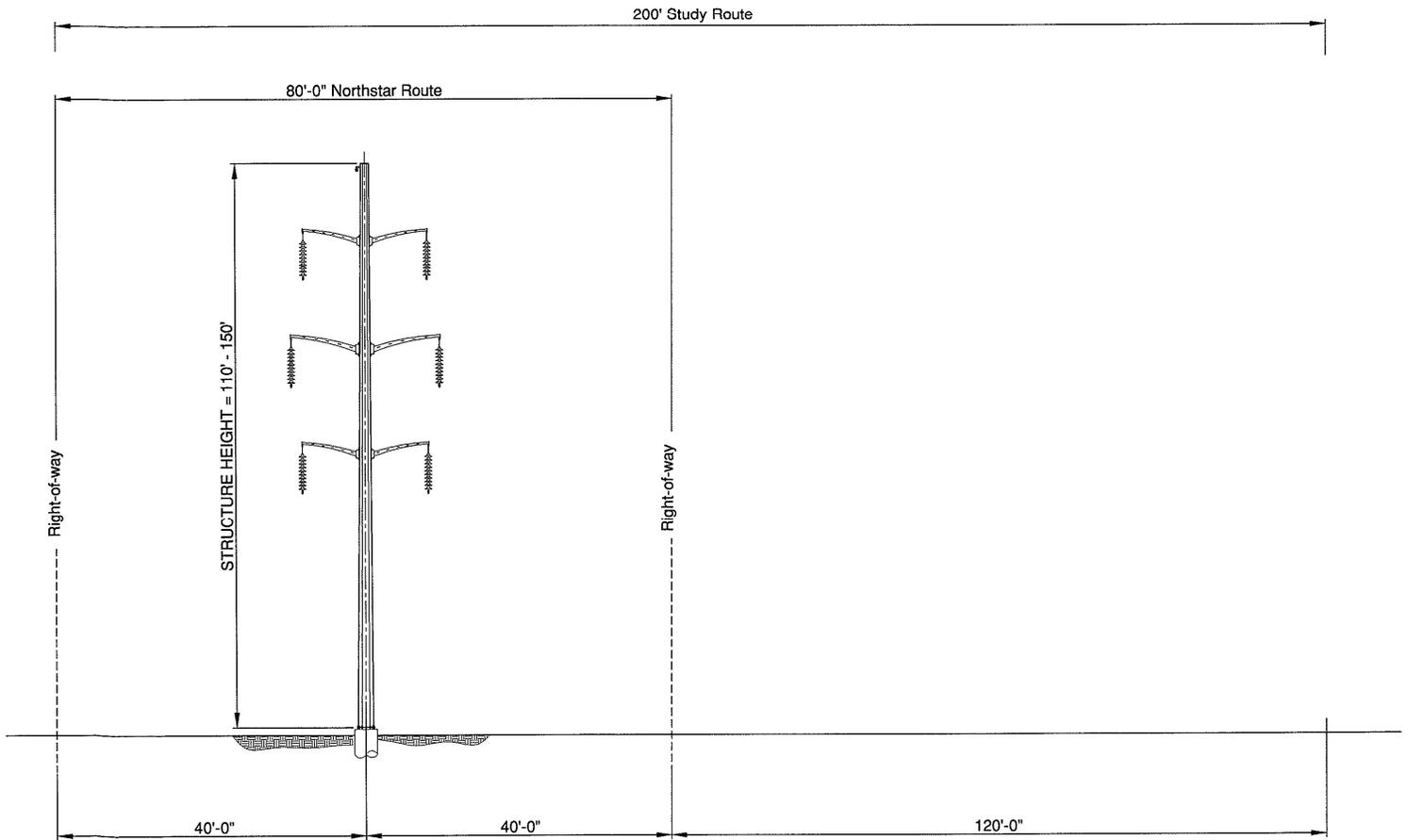


Figure 6 161 kV Line on Private Property North of County Highway 14



161kV Line Double Circuit along Xcel Energy Transmission Line
80' Typical Northstar Route and 200' Study Route

Figure 7 161 kV Line Double Circuit along Xcel Transmission Line

There will be an easement for power poles and overhang in the SW 1/4 of Sec.20 Township 102N Range 34 West in Jackson County on the Everett Aschemann property. There will also be an easement in the SE 1/4 of Sec.19 on the Everett Aschemann and Fairland Management Company property. There will then be an easement on the north 1/2 of Section 20 to the proposed switching station.

There will be a license agreement with the Wisconsin Township use of the ROW of 789th and 790th Streets. There will be an overhang easement across property owned by Farmers Cooperative Association in north 1/2 of Section 19.

There will be an overhang easement across property owned by Iowa, Chicago and Eastern Railroad Corporation in the north half of Section 19.

4.5.2 Electric and Magnetic (EMF) Fields

The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric and magnetic fields. Electric and magnetic fields are produced by the voltage and the flow of electricity on a line. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field related to the current flow through the conductors. Most transmission lines operate at 60 hertz (cycles per second) voltage and current.

4.5.2.1 Electric Fields

A voltage on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with an electric transmission line extends from the energized conductors to other nearby objects such as the ground, structures, trees, vegetation, buildings, and vehicles, and gets weaker with distance from the line. Trees and buildings also greatly reduce the strength of power line electric fields.

The intensity of electric fields is proportional to the voltage of the line and is measured in kilovolts per meter (kV/m). Power line electric fields are designated by the difference in voltage between two points (usually 1 meter).

Table 4-2 lists the calculated maximum electric fields for the proposed 161 kV transmission line, at one meter above ground, at various distances from the line. The maximum conductor voltage, which is defined as the nominal voltage plus five percent, is used in the calculations.

Table 4-2
Calculated Electric Fields (KV/M) for the Proposed 161 KV
Transmission Line at 1 meter (3.28 feet) above ground

Line Type	Line Voltage	Distance to Proposed Centerline										
		-300'	-200'	-100'	-50'	-10'	0'	10'	50'	100'	200'	300'
Single Circuit 161 kV Single Pole	169 kV	0.01	0.03	0.12	0.4	1.03	1.61	1.94	0.35	0.13	0.04	0.02
Double Circuit 161 kV Single Pole	169 kV	0.04	0.08	0.21	0.07	3.39	3.9	3.39	0.07	0.21	0.08	0.04

The proposed 161 kV transmission line will have a maximum electric field intensity of approximately 3.39 kV per meter at one meter above ground and, ten feet from centerline on the side of the structure with two phases. This is significantly less than the maximum limit of 8 kV per meter that has been a permit condition imposed by the Minnesota Environmental Quality Board (MEQB) in other high voltage transmission line applications. The MEQB standard was designed to prevent serious hazard from shocks

when touching large objects, such as tractors, parked under extra high voltage transmission lines of 500 kV or greater.

4.5.2.2 Magnetic Fields

Magnetic fields are present around electrical devices, and can occur indoors and outdoors. Magnetic fields are produced by the flow of electricity or current that travels along transmission lines, distribution (feeder) lines, substation transformers, house wiring, and household electrical appliances. The intensity of a magnetic field is related to the current flow through the conductors (wires).

Considerable research has been conducted throughout the past three decades to determine whether exposure to power-frequency (60 hertz) electric and magnetic fields causes biological responses and health effects. Epidemiological and toxicological studies have shown no statistically significant association or weak associations between EMF exposure and health risks.

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

Minnesota, California and Wisconsin have all recently conducted literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from high voltage transmission line EMF effects. The Working Group consisted of staff from various state agencies. The Working Group published its findings in a White Paper on EMF Policy and Mitigation Options in September 2002. Minnesota Department of Health, 2002. The findings of the Working Group are summarized below.

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

The MEQB addressed the matter of EMF with respect to new transmission lines in a number of separate dockets over the past few years. As an example, see Docket Nos. 03-64-TR-XCEL (161 kV Lakefield line). The findings of the MEQB and the discussion in the Environmental Assessments prepared on each of those projects are pertinent to this issue with respect to the proposed projects. Documents from those matters are available on the Commission webpage: www.energyfacilities.puc.state.mn.us.

In June 2005, in Docket Number. 03-73-TR-XCEL for the 345 kV Buffalo Ridge Line, the MEQB made the following findings with regard to EMF:

No significant impacts on human health and safety are anticipated from the Project. There is at present insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and any adverse health effects. The MEQB has not established limits on magnetic field exposure and there are no Federal or Minnesota health-based exposure standards for magnetic fields. There is uncertainty, however, concerning long term health impacts and the Minnesota Department of Health and the MEQB all recommend a "prudent avoidance" policy in which exposure is minimized.

Table 4-3 provides the anticipated magnetic fields based on the proposed line height, and structure design. The anticipated magnetic field, in milliGauss, for the proposed line and phase current has been calculated at various distances from the center of the pole, using average and peak current values.

**Table 4-3
 Calculated Magnetic Flux Density (milligauss) for Proposed
 161 kV Transmission Line (3.28 feet above ground)**

Structure Type	Condition	Amps	Distance to Proposed Centerline								
			-300'	-200'	-100'	-50'	0'	50'	100'	200'	300'
Single Circuit 161 kV Single Pole	Average	300	0.31	0.66	2.47	8.13	36.5	10.2	3	0.8	0.33
Single Circuit 161 kV Single Pole	Peak	755	0.77	1.67	6.21	20.5	91.9	25.5	7.5	1.9	0.84
Double Circuit 161 kV Single Pole	Average	300	0.07	0.21	1.39	6.75	39.1	6.75	1.4	0.2	0.07
Double Circuit 161 kV Single Pole	Peak	755	0.17	0.52	3.49	17	98.4	17	3.5	0.5	0.17

4.5.2.3 Stray Voltage

"Stray voltage" is a condition that can occur on the electric service entrances to buildings from distribution lines, not transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to prevent stray voltage problems when the transmission line proposed in this Application are parallel to or cross distribution lines.

4.5.2.4 Farming Operations Vehicle Use and Buildings near Power Lines

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will 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. Potential shocks can be prevented by using the following methods: 1) one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected or 2) an electric filter can be installed that grounds out charges induced from a power line while still allowing the fence charger to be effective.

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

There is a potential for vehicles under high voltage transmission lines to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap to the vehicle long enough to touch the earth. Such buildup is a rare event, however, because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic, or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the ROW because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the ROW could damage a transmission line. As a result, NESC guidelines establish clear zones for transmission facilities.

5.0 CONSTRUCTION RESTORATION AND MAINTENANCE METHODS

5.1 Transmission Construction Procedures

After federal, state and local approvals are obtained, property easements and route licenses are acquired, soil conditions are established and final design is completed, the construction contractor will begin mobilizing. Construction will follow standard construction and mitigation practices. These practices address staging, erecting transmission line structures and stringing transmission lines. Construction and mitigation practices to minimize impacts will be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other practices and conditions.

Typical construction equipment used on a 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 are transported on tractor-trailers.

Efforts will be made to stage construction within the road ROW to the greatest extent possible. A three to five acre staging area will be required to store and handle materials. The Applicant will obtain temporary construction easements, as necessary.

After the construction contractor has mobilized his equipment and crews to the Project site, the poles are installed. The installation begins by moving the poles by truck from the staging areas to the staked location and placing them within the roadway ROW until the structures are set. Typically, access to the transmission line route is made directly from the existing roads or trails that run parallel or perpendicular to the transmission line route. Where the transmission line route does not parallel a road, access will be gained where the route crosses an existing road. Permission from the property owner is 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 may be upgraded or new roads may be constructed. New access roads may also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches.

Most of the steel poles will be placed directly in the ground. Holes are drilled one to two feet larger than the base of the pole, the pole is placed in the hole, and the hole is then filled with granular material. In some locations culverts may be used in the hole to provide adequate support for the pole. Angle, dead end and double circuit structures will be placed on concrete foundations. In those cases, holes will be drilled the diameter and depth of the foundation in preparation for the concrete, rebar and anchor bolts placed in the hole, and the hole filled with concrete. The concrete foundations may vary from four to seven feet in diameter and 12 or more feet deep, depending on soil conditions. Concrete trucks are required to bring the concrete from a local concrete batch plant to the site.

After the poles are set, the three conductors and shield wire are strung between the poles. The wire is typically strung in approximately two mile sections. The stringing equipment is set up within the licensed transmission line route. Access to each structure is required to attach the conductors to the insulators and shield wire to the clamps. Temporary guard structures are set at each road, railroad and other wire crossings to keep the wire off the crossing.

Environmentally sensitive areas and wetland areas may require special construction techniques in some circumstances. All such techniques will be performed in accordance with the permits issued for the work (see Section 5.5). The most effective way to minimize impacts to wetland areas is locating structures outside of wetlands and adjacent resource areas when possible and spanning all streams and rivers. Construction equipment will not be driven across 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 established construction practices and the provisions of the corresponding permits will protect the topsoil, help prevent soil erosion and ensure that equipment fueling and lubricating will occur at a distance from waterways. Construction crews will maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources, and to minimize soil erosion. Crews will avoid major disturbance of individual wetlands and drainage systems during construction.

5.2 Restoration Procedures

During construction, crews will 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. When construction is completed, disturbed areas are restored to their original condition to the maximum extent practicable. If damage has occurred to crops, fences, drain tiles, or the adjacent property, the Applicant will repair and/or fairly reimburse the landowner for the damages sustained. The Applicant will 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 lines will 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 will require assistance in reestablishing the vegetation stratum and controlling soil erosion.

5.3 Maintenance Procedures

Transmission lines and substations are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation.

Maintenance of the line will be performed by an experienced contractor under a long-term service agreement including line inspection, equipment maintenance, and repairs. Vegetation growth will be monitored approximately every 5 years. If undesirable vegetation has become established that would affect the safe operation or maintenance of the line, the vegetation would be removed.

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

5.4 Estimated Project Costs

Northstar Transmission completed a preliminary cost estimate for the Project and estimates that the transmission line and substations will cost approximately \$10.1 to \$10.2 million. The estimated cost of each facility is as follows:

161 kV Transmission Line	\$ 5,200,000
Tatman Project Substation	\$ 3,000,000
Double-circuiting Xcel Energy 161 kV Line (POI Option 1)	\$ 1,900,000
Switching station (POI Option 2)	\$ 2,000,000
Total Project Cost	
POI Option 1	\$10,100,000
POI Option 2	\$10,200,000

Although not itemized, the cost of the mitigation measures required under Minn. R. 7849.5220, Subp. 3(h) has been factored into the overall Project cost.

Since the transmission line and associated facilities will be new construction, including the portion of the existing Xcel Energy line that will be double-circuited, the annual operating and maintenance expenses will be primarily inspection costs, which will be between approximately \$5,000 and \$10,000 per year.

5.5 List of Permits

Table 5-1 summarizes the federal, state and local permits that may need to be obtained prior to construction of the proposed transmission line and substation facilities.

Table 5-1
List of Potential Required Permits Permit Description Jurisdiction

Permit Description	Jurisdiction
Notice of Proposed Construction or Alteration Application	Federal Aviation Administration
Preconstruction Notification	US Army Corps of Engineers
Preconstruction Notification	Jackson County Soil and Water Conservation District
Utility License Agreement / Line Crossing Permit	Jackson County Department of Transportation
Over-width/Overweight Road Permit	Jackson County Department of Transportation
License to Cross Public Waters	MDNR Division of Lands and Minerals
Route Permit (Alternative Process)	Minnesota PUC
NPDES Storm Water Permit for Construction	Minnesota Pollution Control Agency
Road Crossing Permit	Township, County
Road Right-of-Way Use License	Township, County
Driveway Access Permits	Township, County
Over-width/Overweight Road Permit	Township, County

5.5.1 Federal Permits

Notice of Proposed Construction or Alteration Application – Federal Aviation Association

The Proposed Project is within the Jackson Municipal Airport area of influence, as determined by the Minnesota Department of Transportation (MNDOT), Aeronautics and Aviation Division, an application must be submitted for each structure within the flight area of influence.

Preconstruction Notification – Army Corps of Engineers (ACOE)

Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities are covered under USACOE St. Paul District Regional General Permit (RGP-03-MN) under Paragraph G – Structural Discharges.

5.5.2 State Permits

Route Permit (Alternative Process) – Minnesota Public Utilities Commission (PUC)

As described in Sections 1.0 and 2.0, Minn Rules Chapter 7849 requires a Route Permit from the PUC for construction of high voltage transmission lines (HVTL). The Proposed Project is eligible for the Alternative Permit Process, as defined in Minn. Rules 7849.5500, subp.1.C.

National Pollutant Discharge Elimination System (NPDES) – Minnesota Pollution Control Agency (MPCA)

Construction projects that disturb greater than one acre of land surface require an NPDES Storm Water Permit for construction activities. The Proposed Project would qualify for a General Permit under this program. Permit application submittals include submittal of a Storm Water Pollution Prevention Plan (SWPPP) that incorporates Best Management Practices (BMPs) to minimize discharge of pollutants from areas disturbed by construction.

License to Cross Public Waters

The Minnesota Department of Natural Resources (DNR) Division of Lands and Minerals regulates utility crossings over, under or across any state land or Public Water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minn. State 84.425 and Minn. Rules Chapter 6135.

5.5.3 County Permits

Utility License Agreement / Line Crossing Permit – Jackson County Department of Transportation

Transmission or underground lines crossing county highways will require a DOT utility license agreement from Jackson County Department of Transportation. The Proposed Project occupies approximately 1.5 miles of County Highway 25, 0.25 miles of County Highway 14 and crosses County Highways 4 and 14.

Over-width/Overweight Load Permit

Permits may be required to move over-sized loads on county roads.

Preconstruction Notification – Jackson County Soil and Water Conservation District

Jackson County Soil and Water Conservation District may have jurisdiction over wetlands not covered by the state or federal jurisdictions.

5.5.4 Local Permits

The following local permits may be required prior to beginning construction of the Proposed Project:

Road Crossing and/or Road-Right-of-Way Permits

Road Crossing Permits may be required from Petersburg and Wisconsin Townships to cross or occupy roadway rights-of-way.

Driveway Access Permit

A permit may be required from Jackson County to provide a curb cut onto County Highway 25 for the Tatman Project Substation. Additionally additional curb cuts may be required from the Townships of Wisconsin and Petersburg to allow access roads onto local roadways (560th Avenue).

Over-width/Overweight Load Permit

Permits may be required to move over-sized loads on county, city and/or township roads environmental Information.

6.0 ENVIRONMENTAL INFORMATION

6.1 Environmental Setting

The area is currently primarily in rural agricultural land use. Also present along the transmission line route are grasslands, forest, wetland and rural residential land.

The environmental setting includes hydrologic features such as creeks, the Des Moines River, and wetlands, with associated wildlife habitat. National Wetland Inventory (NWI) maps and field reconnaissance identified several drainage features and one wooded swamp associated with the Des Moines River within the transmission line route. The Des Moines River intersects the transmission route. Vegetation in the wetlands consists primarily of sedges and reed canary grass as well as some red maples and cottonwoods near the vicinity of the Des Moines River crossing. However, since the majority of the transmission line route is adjacent to roadways or within agricultural fields, the existing vegetation, which

consists primarily of grass species and invasive weeds, is not unique or representative special wildlife habitat.

The transmission line route is within county highway ROW until it crosses State Highway 14 in the Township of Wisconsin, where it traverses private agricultural land and enters the switching station. Urban and industrial areas are also present to the east of the switching station.

The environmental features of the Project area do not preclude the development of this Project. Information on environmental resources along the proposed transmission line route is provided in this section. Environmental fieldwork was conducted between May 14 and May 16, and August 13, 2008.

6.2 Human Settlement Impacts

6.2.1 Public Health and Safety

Public Safety

Proper safeguards would be implemented for construction and operation of the transmission facilities. The Proposed Project would conform to all applicable local, state, and National Electric Safety Code (NESC) standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths. Construction crews would comply with local, state, NESC standards regarding installation of facilities and standard construction practices to protect public health and safety. The applicants and industry safety procedures would be followed during and after installation of the transmission line, including clear signage during all construction activities.

The transmission line design includes devices to protect the public in the event of an accident involving structures and/or conductors. Protective devices would include breakers and relays located where the transmission line connects to the Tatman Project Substation. The protective equipment would de-energize the transmission line should an accident occur. In addition, the substation facilities would be fenced and posted with warning signs, and access would be limited to authorized personnel.

Airport Flight Safety

The nearest public use airport, the Jackson Municipal Airport on County Road 34 E, is approximately 1.5 miles northwest of the Project area. Based on the Federal Aviation Administration (FAA) regulations regarding potential obstructions in proximity to public use airports, depending upon the final design for the transmission line and switching station and the height of structures nearest the airport, Northstar Transmission, LLC will file a Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the FAA along with pertinent final design drawings to confirm that the proposed transmission line and construction activities in the vicinity of the airport will not impact air navigation or airport operations.

Mitigation

Measures to avoid and minimize potential impacts to human health and safety are incorporated into the proposed facility design and are considered to be part of the base design cost. No additional mitigation measures are needed or proposed.

6.2.2 Land Use, Land Acquisition and Landowner Displacement

Section 4.5.1.1 describes the licenses and easements necessary to acquire the rights to construct the Proposed Project. The proposed transmission line route is located primarily in and adjacent to roadway and utility ROWs.

Mitigation

Measures to avoid and minimize land use impacts are incorporated into the Project’s route locations. Northstar Transmission, LLC has coordinated with private land owners, township and county officials and representatives of the REA Coop of Jackson County to minimize land use impacts. The Proposed Project would not result in displacement of existing residences or businesses.

No additional mitigation measures are needed or proposed.

6.2.3 Noise

Noise is generally defined as unwanted sound. Noises can vary in volume (loudness) and frequency spectrum (pitch). Noise generation is generally measured and regulated based on volume, measured in units of A-weighted decibels (dBA), a logarithmic scale that corresponds to the sensitivity range for human hearing. On this scale, a 3 dBA increase is essentially imperceptible to most humans; a 5 dBA increase in noise is perceptible; and a 10 dBA increase is perceived as a doubling in loudness. Table 6-1 shows noise levels associated with common sources.

**Table 6-1
 Common Noise Levels**

Sound Level dB(A)	Noise Source
140	Jet Engine (at 25 meters)
130	Jet Aircraft (at 100 meters)
120	Rock and Roll Concert
110	Pneumatic Chipper
100	Jointer/Planer
90	Chainsaw
80	Heavy Truck Traffic
70	Business Office
60	Conversational Speech
50	Library
40	Bedroom
30	Secluded Woods
20	Whisper

Source: A Guide to Noise Control in Minnesota, MPCA, 1999

The Minnesota Pollution Control Agency (MPCA) has established regulatory standards for allowable noise levels in Minnesota, defined in Minnesota Rules 7030.0050. These regulatory standards are based on land use classifications, grouped according to noise sensitivity, or Noise Area Classifications (NAC). The most sensitive group of receptors is NAC 1 – applicable to residences, hospitals, churches and campgrounds. These standards also vary between daytime and nighttime allowable limits. Table 6.2 summarizes the MPCA’s noise standards grouped by NAC. The standards are expressed in terms of L₅₀ (the dBA that may be exceeded 50 percent of the time within an hour) and L₁₀ (the dBA that may be exceeded 10 percent of the time within an hour).

**Table 6-2
 Rule 7030.0040 Noise Area Classifications**

Day (0700-2200)			Night (2200-0700)	
NAC	L ₅₀	L ₁₀	L ₅₀	L ₁₀
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

The sources of audible noise from the Proposed Project would be the transmission line conductors and the substation transformers. The level of noise generated is dependent on equipment conditions, voltage levels, ambient noise levels, and weather conditions. Under foggy, damp or rainy conditions, transmission conductors can create a crackling sound as the electricity ionizes the moist air near the wires (a ‘corona’ condition). During dry weather, noise from electrical transmission facilities is faintly audible or inaudible. Noise levels directly adjacent to 161 kV transmission lines and Tatman Project Substation property line would generally be below the 20-30 dBA level, i.e., well below the MPCA noise regulatory action levels listed in Table 6.2.

Transformers will produce noise whenever they are energized, and the level of noise, or its loudness, depends on transformer size, operating condition (cooling fans on or off, etc.), voltage level, weather conditions, and ambient noise levels. This noise can be described as a continuously radiated humming sound. Generally, noise levels during operation and maintenance of substations are minimal. Equipment design and placement has a significant effect on controlling noise levels from the Project’s substation. Minnesota’s regulatory standards will determine the manufacturer’s specifications for noise emissions. The Tatman Project Substation is surrounded by rural land uses and should not have significant noise impacts on nearby receptors. Further study of potential noise emissions will be completed during the detailed siting assessment and engineering design phase to identify candidate noise mitigation measures such as low National Electrical Manufacturers Association (NEMA) noise rated transformers, acoustic shielding, increased setback distances, or other such methods, as necessary, to meet the State regulatory noise requirements. Noise produced from the operation of the switching station under normal conditions is expected to be at or below existing ambient levels.

Mitigation

No mitigation is necessary, since there will be minimal or no noise impacts resulting from the Proposed Project.

6.2.4 Aesthetics

The Project area lies in a rural location with farming and related agricultural operations dominating the land use. Agricultural fields, farmsteads, fallow fields and large open vistas visually dominate the area surrounding the Project and the topography is relatively flat with gently rolling hills. The landscape can be classified as rural open space where the visual resources of the area are neither unique to the region nor entirely natural.

Structure and color features in the visual region of influence include those associated with wetlands around the Des Moines River, cultivated cropland, shelterbelts and manmade structures such as farmsteads, distribution lines, roadways and other structures. Colors are seasonally variable and include green crop and pasture land during spring and early summer, green to brown crops and pasture during late summer and fall, brown and black associated with fallow farm fields and brown and white associated with late fall and winter.

The settlements are primarily residences and farm buildings with shelterbelts in some locations along the rural roads (560th Avenue) and county roads (County Highway 25, 4, 8, 23 and 14). These settlements are the focal points in the dominant open space character of the Project area. Viewing locations or anticipated concentration of sensitive viewers (or the highest incidence of sensitive viewers) near the Project area would include receptors in Wisconsin and Petersburg Townships and the City of Jackson. There are approximately 20 residences along the transmission line route and several more just north of the City of Jackson. These residences also have view of the two REA Coop of Jackson County distribution lines which are situated on 60 to 75 foot high wood poles spaced approximately 100 to 200 feet apart. Currently, there are no distinctive landscape features in the Project area that would require specific protection from visual impairment.

Mitigation

Northstar Transmission, LLC proposes to collocate the distribution lines with the transmission facilities thereby consolidating electrical utilities within one ROW. In addition, the transmission line will be located along roadway ROWs for most of the route. The Northstar Transmission Line and the Xcel transmission line will be located on a double circuit single pole from pole 114 to the Jackson Substation, a distance of approximately one mile. There will be no change in the character of the transmission line route because there are already existing utility ROWs (roadways or transmission line ROWs). Therefore, no mitigation measures have been proposed.

6.2.5 Socioeconomic Impacts

Population characteristics and economic data (based on U.S. Census data) for the study are described in this section.

Demographics

Minnesota's population increased by 12.4 percent from 1990 to 2000. According to Census 2000, the White population group comprised 89.4 percent of the population, as shown in Table 6-3. Minnesota's minority population included 3.5 percent Black, 2.9 percent Asian, 1.1 percent American Indian or Native Alaskan, and 1.3 percent and 1.7 percent categorized as "some other race" or "more than one race," respectively. The Hispanic or Latino group comprised 2.9 percent of the total population (Hispanics can be of any race). Females accounted for 50.5 percent of the population and males accounted for 49.5 percent of the population in Minnesota in 2000, and 73.8 percent of the population was age 18 and over.

Jackson County experienced a decline in population of 3.5 percent from 1990 to 2000. According to Census 2000, the White population comprised 97.1 percent of the population. The minority population in Jackson County included 1.4 percent Asian, less than one percent Black or American Indian and Native Alaskan, and one percent and 0.4 percent categorized as "some other race" or "more than one race," respectively. The Hispanic or Latino group comprised 1.9 percent of the total population (Hispanics can be of any race). Males accounted for 50.2 percent of the population and females accounted for 49.8 percent of the population in Jackson County in 2000, and 75.5 percent of the population was age 18 and over.

The City of Jackson's population decreased by 1.6 percent from 1990 to 2000. The White population group comprised 94 percent of the population according to Census 2000. The minority population in the City of Jackson included four percent Asian, 0.3 percent Black, 0.2 percent American Indian and Native Alaskan, and 0.8 percent and 0.7 percent characterized as "some other race" or "more than one race" respectively. The Hispanic or Latino group comprised 1.5 percent of the total population (Hispanics can be of any race). Females accounted for 51.5 percent of the population and males accounted for 48.5

percent of the population in the City of Jackson in 2000, and 76.7 percent of the population was age 18 and over.

Wisconsin Township’s population decreased by 6.4 percent from 1990 to 2000. The White population comprised 99.6 percent of the population. The remaining 0.4 percent of the population was characterized as “more than one race.” The Hispanic or Latino group comprised 1.1 percent of the total population (Hispanics can be of any race). Males accounted for 52.9 percent of the population and females accounted for 47.1 percent of the Wisconsin Township population in 2000, and 74.9 percent of the population was age 18 and over.

Petersburg Township’s population decreased by 6.6 percent from 1990 to 2000. The White population comprised 99.6 percent of the population. The remaining 0.4 percent of the population was in the Asian minority group. Males accounted for 50.6 percent of the population and females accounted for 49.4 percent of the population in 2000 in Petersburg Township, and 78.4 percent of the population was age 18 and over.

**Table 6-3
Population and Economic Characteristics**

Location	Population 1990	Population 2000	Change 1990-2000	Minority Population (%)	Caucasian Population (%)	Per Capita Income	Percentage of Population Below Poverty Level
State of Minnesota	4,375,099	4,919,479	12.4%	10.6%	89.4%	\$ 23,198 (2000) *\$38,859 (2006)	7.9%
Jackson County	11,677	11,268	-3.5%	2.9%	97.1%	\$ 17,499 (2000) *\$29,911 (2006)	8.6%
City of Jackson	3,559	3,501	-1.6%	6%	94%	\$ 18,444	11.1%
Wisconsin	281	263	-6.4%	0.4%	99.6%	\$ 16,996	1.4%
Petersburg	288	269	-6.6%	0.4%	99.6%	\$ 16,799	6.4%

Source: U.S. Census Bureau, Census 2000; Minnesota Land Management Information Center; *Bureau of Economic Analysis.

Economy

According to the Bureau of Economic Analysis, Minnesota’s per capita income was \$38,859 in 2006, which represents 106 percent of the U.S. per capita income. Minnesota’s population in 2000 included 7.9 percent of individuals below the poverty line, compared to the nation’s 12.4 percent.

Employment in Minnesota totaled 3,571,011 jobs in 2006, with the educational, health and social services sectors accounting for 13.6 percent of jobs, manufacturing providing 10 percent of jobs, and the retail sector furnishing 10.8 percent of jobs. State and local government comprised 10 percent of jobs and farm employment accounted for 2.7 percent of jobs.

According to the Bureau of Economic Analysis, Jackson County’s per capita income was \$29,911 in 2006, which represents 81 percent of the U.S. per capita income. Jackson County’s population in 2000 included 8.6 percent of individuals below the poverty line.

Employment in Jackson County totaled 8,023 jobs in 2006, with the manufacturing sector providing 16 percent of jobs, the retail sector furnishing 7.8 percent of jobs, and the construction sector providing 4.8 percent of jobs. State and local government comprised 10.8 percent of jobs and farm employment accounted for 14.9 percent of jobs.

According to the U.S. Census Bureau, Census 2000 data, the City of Jackson's per capita income was \$18,444. The City of Jackson's population in 2000 included 11.1 percent of individuals below the poverty line.

Employment in the City of Jackson for persons 16 and over totaled 1,822 of 2,799 individuals in 2000. The manufacturing sector provided 20.5 percent of jobs, the educational, health, and social services sector furnished 16 percent of jobs, and the retail trade comprised 13.8 percent of jobs in 2000.

According to the U.S. Census Bureau, Census 2000 data, Wisconsin Township's per capita income was \$16,996. The Wisconsin Township population in 2000 included 1.4 percent of individuals below the poverty line.

Employment in Wisconsin Township for persons 16 and over totaled 146 of 206 individuals in 2000. The educational, health, and social services sector provided 25.4 percent of jobs, the manufacturing sector furnished 19 percent of jobs, and the agriculture, forestry, fishing and hunting, and mining sector comprised 17.6 percent of jobs in 2000.

According to the U.S. Census Bureau, Census 2000 data, Petersburg Township's per capita income was \$16,799. The Petersburg Township population in 2000 included 6.4 percent of individuals below the poverty line.

Employment in Petersburg Township for persons 16 and over totaled 150 of 208 individuals in 2000. The manufacturing sector provided 24.3 percent of jobs, the agriculture, forestry, fishing and hunting, and mining sector furnished 18.1 percent of jobs, and the retail trade comprised 15.3 percent of jobs in 2000. The educational, health, and social services sector provided 9.7 percent of jobs.

The Proposed Project would require acquisition of parcels for the Tatman Project Substation and the Jackson Switching Substation, both of which currently are used for agricultural purposes. Additionally, the Proposed Project would require approximately 50 feet of overhang easement along approximately 20 private parcels along the transmission line route. Section 6.3.1 discusses the Proposed Project's minimal impacts to agricultural operations. Property acquisition for these facilities and for transmission line ROW would include compensation for affected property owners. The Proposed Project would not result in economic losses to property owners. Also, the Proposed Project is not expected to displace or economically affect low-income or minority populations.

Mitigation

No mitigation is necessary, since no potential negative socioeconomic impacts were identified related to the Proposed Project.

6.2.6 Cultural Values

The Jackson County Development Code was used to identify key community values and community land use goals. The Code primarily focuses on managing the economic development in urban areas and continued agricultural growth in rural areas while protecting natural resources that serve as a basis for recreation and tourism in the county. The overall growth plan in Jackson County can be summarized by the following goals: 1) Preservation of commercial agriculture as a viable, permanent land use and an essential long-term permanent activity in the county, 2) Protection of major natural resource areas in the county to serve as a basis for recreation and tourism in the county, and 3) Location of urban density development near the cities where urban services can easily be provided and extended. These planning principles emphasize protecting the viable agricultural areas in the county and encouraging urban growth to take place in the areas adjacent to existing cities, thereby creating an orderly pattern of development

that preserves the character of the county's urban and rural areas. This is intended to minimize urban-rural conflicts, allow urban growth near the cities, and also protect the prime agricultural land in the county.

The Proposed Project is located within Wisconsin, Petersburg and Des Moines Townships and is identified as being primarily cultivated land, with smaller proportions of transitional agricultural land, rural, residential, and deciduous forest. As noted previously, the purpose of the Proposed Project is based on the need to meet increasing electric demands in the growth areas of the Twin Cities metropolitan service area. Jackson County already participates in the wind energy field by hosting wind farms and transmission lines.

The Proposed Project is consistent with this policy since it minimizes property impacts by locating transmission lines within or directly adjacent to existing utility, roadway or other public ROWs; and it includes power pole sharing with local distribution lines for approximately one-third of the route (see Section 4.1). Therefore, no substantive cultural value impacts are anticipated to result from the Proposed Project.

Mitigation

No mitigation is necessary, since the Proposed Project concept includes planning and design features that are consistent with local cultural values.

6.2.7 Recreation

The proposed transmission line will not be routed through any state or national wilderness areas, state or national parks, or state scientific and natural areas. Recreational opportunities near the Proposed Project include a snowmobile trail, the Des Moines River, a golf course, and a campground as shown on Figure 8.

The Jackson County Snowdrifters Trail is maintained by the Jackson County Snowdrifters Snowmobile Club. The transmission line would cross a portion of the snowmobile trail at County Road 4. Because the trail is located along an existing county road, aesthetic impacts are expected to be minimal.

The Des Moines River is used for recreational boating activities. The proposed transmission line crosses the Des Moines River at approximately river mile 6.8 near the confluence of Stony Brook. There would be minor aesthetic impacts due to the installation of new overhead transmission line poles and conductors. Impacts would be similar to those associated with the transmission line crossing at river mile 16.8. There would be little if any visual impact to river users as a result of the proposed transmission line. The DNR does not have any specific restrictions on transmission lines crossing scenic water routes within its regulations. However, an "Application for License to Cross Public Lands or Waters" will be submitted to the DNR Lands and Minerals Region 4 office (see Appendix E).

The City of Jackson contains one golf course within two miles of the Proposed Project. The Jackson Golf Club is a semi-private, nine-hole golf course located on North Highway 71, approximately two miles west of the proposed switching station. The golf club would not experience any aesthetic changes as a result of the proposed 161 kV transmission line and associated facilities.

N

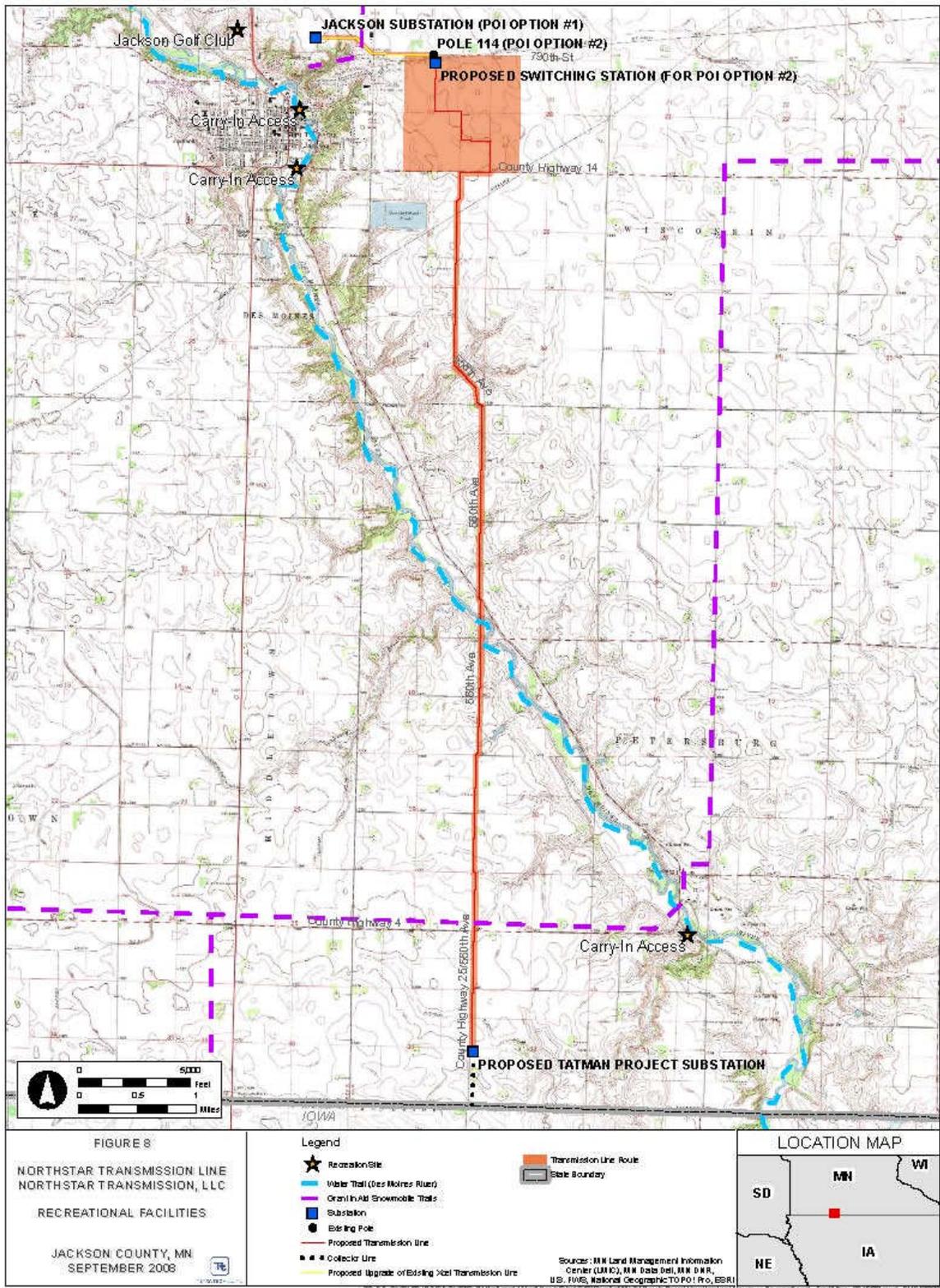


Figure 8 Recreational Facilities

The Jackson KOA Campground is situated on ten acres with 70 sites available. It is located at the junction of U.S. 71 and County Road 34 in Jackson, approximately 2.2 miles northwest of the proposed switching station. The campground would not experience any aesthetic changes as a result of the proposed 161 kV transmission line and associated facilities.

Mitigation

No mitigation is proposed, since no substantive recreational impacts would result from the Proposed Project.

6.2.8 Public Services

Public services provided by local municipal governments, including police and fire protection, water and sewer utility, etc. would not be affected by the Proposed Project. The Proposed Project would facilitate provision of electrical service to Xcel Energy utility customers in Jackson County and southwestern Minnesota, including the Twin Cities metropolitan service area.

Mitigation

No mitigation is proposed, since no public service provision impacts would result from the Proposed Project.

6.3 Land-Based Economic Impacts

6.3.1 Agriculture

The Tatman Project Substation would be located on a 9 acre parcel that is currently used by the Jack Tatman Trust for agricultural purposes. The 9 acre parcel would be purchased by the Applicant from the Jack Tatman Trust. Approximately 2.5 acres at the northwest corner of this parcel would be needed for construction of the substation. The remainder of the parcel could continue to be used for agricultural production. A 2.5 acre parcel at the north end of the transmission line would also be needed for construction of the switching station near the POI with the Xcel Energy line. This parcel is currently used by the Fairland Management Company for agricultural production, but would be purchased by the Applicant.

The proposed 161 kV transmission line route passes through agricultural land in portions of the route. However, as described in Section 4.1, the proposed route is located within existing public utility, roadway or other ROWs and/or along fence rows of agricultural land, minimizing potential impacts to farming operations. No farm fields would be bisected by the proposed transmission route, with the exception of the northernmost 1.5 miles of the route which follows property boundaries through existing agricultural fields. Farmland impacts within the new transmission route would be limited to pole placement within field production areas; and the impact area would be limited to the footprint of the poles. Along the majority of the proposed transmission route the poles would be placed within the public road ROW with no direct impacts to adjacent farmlands. Therefore, there would be minimal impact to farm operations.

Mitigation

No mitigation is necessary, since the Proposed Project concept minimizes agricultural impacts. Construction of the proposed 161 kV transmission line would be scheduled to avoid conflicts with seasonal tillage, planting, and harvesting of agricultural crops wherever possible. Maintenance activity of the transmission line would be conducted in such a way as to minimize impacts to agricultural crops.

6.3.2 Forestry

There are few wooded areas located along the Proposed Project impact areas, and none of those areas are economically significant forest production areas. Therefore, the Proposed Project would not result in forestry-related economic impacts.

Mitigation

No mitigation is necessary, since the Proposed Project would not affect forest production resources.

6.3.3 Tourism

The Proposed Project is not located near any major tourist attractions. The discussion in Section 6.2.7 above concluded that no substantive impacts to any recreational resources in the Proposed Project vicinity would result from the Proposed Project; therefore, no tourism impacts would result.

Mitigation

No mitigation is proposed, since no tourism impacts would result from the Proposed Project.

6.3.4 Mining

Although there are aggregate mines in the region, there are no mined areas or identified potential mineral resources in the immediate area of the Proposed Project or substation/switching station sites. The proposed transmission line would be built largely within existing public road ROW areas which are already unavailable for mining activities. Therefore, the Proposed Project would not result in mining impacts.

Mitigation

No mitigation is necessary, since the Proposed Project would not affect any mining operations.

6.4 Archaeological and Architectural History Resources

The heritage of the proposed Project area is manifested in its archaeological record, architectural history, and in its Native American and European-American communities. These resources represent aspects of the physical environment that relate to culture, society, and institutions that bond communities together and link them to their environmental and social surroundings. In this context, cultural resources can include but are not limited to prehistoric and historic archaeological sites, buildings, structures, objects, districts, natural features, and biota; all of which can be deemed significant to a culture or community for scientific, social, traditional, religious, or other reasons.

A cultural resources assessment was conducted for the proposed Project area with the purpose of identifying known cultural (archaeological and historic) resources within areas of direct and visual effects and identifying portions of the proposed Project area that will require further field-level assessment activities. Information regarding previously documented cultural resources was obtained through a site file search and literature review at the Minnesota Historical Society's State Historic Preservation Office (SHPO) in St. Paul, Minnesota in May 2008. Information regarding previously documented archaeological sites, architectural history properties, and surveys within one mile of the Proposed Project was collected.

Identification of portions of the proposed Project area that will require further field-level assessment activities was completed through a review of historic maps and aerial photographs, a windshield survey of the proposed transmission line, and photo-documentation of the route. During this portion of the cultural resource assessment, areas of interest and current surface conditions were documented to assist with future cultural resource surveys in the proposed Project area.

Minnesota's prehistory has been divided into three broad cultural periods: Pre-Contact (9,500 B.C. to A.D. 1650), Contact (A.D. 1650 to 1837), and Post-Contact (1837 to 1945). The Pre-Contact Period includes several traditions such as Paleoindian (9,500-7,000 B.C.), Archaic (7,000-500 B.C.), Woodland (500 B.C.-A.D.1650), Plains Village (A.D.900-1300), Mississippian (A.D.1300 to 1650), and Oneota (A.D.1300-1650 B.P.). By A.D. 1650, the first French explorers had reached Minnesota, ending Minnesota's prehistory and initiating the Contact Period. This period is further broken down based on Euro-American influences in the state including: French (1650-1803); British (1763-1816); and the Initial United States Presence (1803-1837). At that time, the Native American tribes present in the state included the Chiwere Siouan language groups, Eastern Dakota, Western Dakota, and Ojibwe Indians, all of which were in constant interaction with Euro-Americans in search of animal furs. The Contact Period lasted until around 1837 when Native Americans were forcibly divided into communities and put onto reservations while Euro-American settlement expanded and new ways of life (i.e., lumbering and intensive agriculture) overtook the region.

The Post-Contact Period began with the intensive settlement of Minnesota by Euro-Americans and the resettlement of Native Americans to reservations. The waterways in the state initially served as the primary means for commerce, travel, and sustenance for the first Euro-Americans to permanently settle the state and played a major role in the development of the state by providing a means to transport raw materials from Minnesota on barge traffic down the Mississippi River from the port at Duluth to industries in the eastern United States. Three of Minnesota's earliest Post-Contact traditions directly related to the early use of waterways for transportation and include the Early Agriculture and River Settlement (1830s-1870), St. Croix Triangle Lumbering (1837-1920), and Settlement and Fishing on Minnesota's North Shore (1854-1930). As railroad transportation grew and expanded throughout Minnesota, so did the settlement of these previously unpopulated areas and with it came more intensive agriculture (Railroads and Agricultural Development [1870-1940]), lumbering (Northern Minnesota Lumbering [1870-1930]), tourism and recreation (North Shore Tourism and Recreation [1870-1945]), development of large urban centers (Urban Centers [1870-1945]) and the mining (Iron Ore Industry [1880s-1945]). These cultural resources represent some of the state's most interesting and complex cultural resources.

6.4.1 Background Research and Literature Review

During the literature review at the SHPO, one previously reported archaeological site, 71 architectural history properties, and two previous cultural resource investigations were identified within one mile of the Proposed Project. A copy of the email response from the SHPO is included in Appendix D.

One previously reported archaeological site (21JKu) was identified within one mile of the Project area. The site consists of a pre-contact cemetery and is located in Section 6, of T101N, R34W.

A total of 71 architectural history properties were identified within one mile of the Proposed Project (Table 6-4). Most of these properties are located within the City of Jackson, near the northern and western ends of the Proposed Project. Thirty-six properties are listed on the National Register of Historic Places (NRHP) and one property is considered eligible for listing. The remaining 34 properties have not been evaluated for listing to the NRHP.

Table 6-4
Architectural Properties located within one mile of Proposed Project

Site Number	Property Name	Property Address	NRHP Status
JK-JCC-001	House	114 1st Avenue	Not Evaluated
JK-JCC-002	Soucek House	304 1st Street	Not Evaluated
JK-JCC-003	Imperial Annex, Jackson Transfer	3xx 1st Street	Not Evaluated
JK-JCC-005	Holecek Brothers, W.F. Swant	300-02 2nd Street	Not Evaluated
JK-JCC-006	Ken Bargfrede Insurance Agency	305 2nd Street	Not Evaluated
JK-JCC-007	Kid's Kloset	307 2nd Street	Not Evaluated
JK-JCC-008	Cinnamon Swirl Bakery	309 2nd Street	Not Evaluated
JK-JCC-009	Commercial building	311 2nd Street	Not Evaluated
JK-JCC-010	Dueber's Department Store	306 2nd Street	Not Evaluated
JK-JCC-011	Jackson Commercial Historic District	2nd St. between Sheridan Street & White Street	Listed
JK-JCC-012	Hutchinson Building	313-15 2nd Street	Listed
JK-JCC-013	Berge Brother's Block	401 2nd Street	Listed
JK-JCC-014	Jack Sprat Grocery	405 2nd Street	Listed
JK-JCC-015	Garrett's Wonder 5 & 10 Store	407 2nd Street	Listed
JK-JCC-016	Ashley Drug Store	413 2nd Street	Listed
JK-JCC-017	Corner Saloon	415 2nd Street	Listed
JK-JCC-018	Jackson National Bank Clock	501 2nd Street	Listed
JK-JCC-019	Jackson National Bank	509 2nd Street	Listed
JK-JCC-020	Burnham Grocery	513 2nd Street	Listed
JK-JCC-021	Burnham Clothing	515 2nd Street	Listed
JK-JCC-022	Catholic Foresters' Hall	603 2nd Street	Listed
JK-JCC-023	Commercial building	605-07 2nd Street	Listed
JK-JCC-024	Pribyl Plumbing	611 2nd Street	Listed
JK-JCC-025	Hansen's Store (razed)	207-13 Ashley Street	Listed
JK-JCC-026	Lindsley & Anderson's Block	207-11 Sherman Street	Listed
JK-JCC-027	Chozen Block	312 2nd Street	Listed
JK-JCC-028	Hunter Store	314 2nd Street	Listed
JK-JCC-029	Fiddes Building	402 2nd Street	Listed
JK-JCC-030	Koranda Meat Market	404 2nd Street	Listed
JK-JCC-031	Kiesel Block	406-10 2nd Street	Listed
JK-JCC-032	Klimesh Bakery	412 2nd Street	Listed
JK-JCC-033	First National Bank	414 2nd Street	Listed
JK-JCC-034	People's Co-op Store	502 2nd Street	Listed
JK-JCC-035	Brown National Bank	504 2nd Street	Listed
JK-JCC-036	Olson Saloon	506 2nd Street	Listed
JK-JCC-037	Grand Theater	508 2nd Street	Listed
JK-JCC-038	Matuska & Skalicky Building	514 2nd Street	Listed

Table 6-4
Architectural Properties located within one mile of Proposed Project

Site Number	Property Name	Property Address	NRHP Status
JK-JCC-039	State Theater	600 2nd Street	Listed
JK-JCC-040	Commercial building	604 2nd Street	Listed
JK-JCC-041	Strom & Strom Insurance	606 2nd Street	Listed
JK-JCC-042	Watcher Plumbing, Basta Meat Market	608-12 2nd Street	Listed
JK-JCC-043	Sabatka & Company	614-16 2nd Street	Listed
JK-JCC-044	Kauth-Kuchenbecker Builders	105 Ashley Street	Listed
JK-JCC-045	M & H Electric	104 Grant Street	Listed
JK-JCC-047	Jackson County Courthouse	413 4th Street	Listed
JK-JCC-048	Jackson Middle School	SW corner 5th Street & Sherman Street	Not Evaluated
JK-JCC-062	House	2xx Cush Street	Not Evaluated
JK-JCC-063	House	2xx Cush Street	Not Evaluated
JK-JCC-064	House	208 Emily Street	Not Evaluated
JK-JCC-065	First Presbyterian Church	NE corner 5th Street & Grant Street	Not Evaluated
JK-JCC-066	National Guard Armory	NE corner Grant Street & 3rd Street	Not Evaluated
JK-JCC-067	House	2xx Highland Street	Not Evaluated
JK-JCC-074	Onken House	219 Moore Street	Not Evaluated
JK-JCC-076	Salem Lutheran Church	5xx Highway Street North	Not Evaluated
JK-JCC-077	House	619 Park Street	Not Evaluated
JK-JCC-078	House	705 Park Street	Not Evaluated
JK-JCC-079	Evangelical Lutheran Church	SE corner Park Street & Highway Street North	Not Evaluated
JK-JCC-080	House	709 5th Street	Not Evaluated
JK-JCC-081	House	2xx River Street	Not Evaluated
JK-JCC-082	Ashley Park Cabin	4xx Riverside Drive	Not Evaluated
JK-JCC-083	Ashley Park Monument	4xx Riverside Drive	Not Evaluated
JK-JCC-084	House	42x Riverside Drive	Not Evaluated
JK-JCC-085	House	315 6th Street	Not Evaluated
JK-JCC-086	Rural Electric Association	NE corner Sherman Street & 4th Street	Not Evaluated
JK-JCC-087	William W. Wold Dental Office	313 Sherman Street	Not Evaluated
JK-JCC-088	George E. Williamson House	702 Sherman Street	Not Evaluated
JK-JCC-089	House	710 Sherman Street	Not Evaluated
JK-JCC-099	House	410 Thomas Hill Road	Not Evaluated
JK-JCC-104	Old Roundhouse (razed)	Jackson Street & Moore Street	Not Evaluated
JK-JCC-105	Jackson Dam	Across Des Moines River at Jackson	Considered Eligible
JK-JCC-106	Bridge No. 6741	US TH71 across Des Moines River	Not Evaluated

The two surveys identified during the literature review at the SHPO were conducted outside the proposed Project area, but within one mile. A summary of these two surveys is presented below.

- A Phase I survey completed by Tellus Consultants, Inc. in 1994 involved the survey of two stream banks locations along the Des Moines River within Jackson County. One survey location is near the proposed Project area in the SW ¼ of Section 8, T101N, R34W. During the survey, no cultural materials were noted.

- In 2003, Stemper and Associates completed a Phase I survey of rural waterlines in Jackson County. A pedestrian survey and shovel testing was completed within a 50-foot segment of County Highway 4 that extended along the south side of Sections 29 and 30, in T101N, R34W. No cultural materials were noted during the survey.

6.4.2 Potential Archaeological Resource Impacts

No documented archaeological sites will be affected by the Proposed Project plans. However, a review of the historic documentation including maps and aerials photographs, windshield survey, and photo-documentation suggests the proposed Project area is likely to contain previously undocumented archaeological sites.

6.4.3 Potential Architectural Resource Impacts

A visual area of potential effect extending one-mile from the proposed Project area identified 71 structures. Thirty-six of the identified properties are listed on the NRHP and one property is considered eligible for listing. The potential exists for the Proposed Project to have an adverse visual effect on the listed and eligible properties identified within one mile.

Mitigation

The cultural resources assessment identified the potential for archaeological resources to be located within the proposed Project area, and the presence of listed and eligible architectural history properties within one mile of the proposed route. A Phase IA archaeological survey of the proposed Project area will be conducted to identify archaeological resources in areas with surface visibility greater than 25 percent and to determine the need for additional subsurface testing along the route. The results of the cultural resource assessment and the Phase IA survey will be provided to the Minnesota SHPO for their review and response.

The Minnesota SHPO will be consulted regarding the potential for visual impacts to the 36 NRHP-listed properties and one eligible architectural history property within one mile of the Project area. An appropriate management plan or standing structures survey will be completed with assistance from the SHPO to address potential impacts, if any, on architectural resources.

6.5 Natural Environment

6.5.1 Air Quality

Temporary air quality impacts resulting from installation of the proposed transmission line and construction of the substation and switching station would be limited to emissions from construction vehicles and fugitive dust from ROW clearing activities. These impacts would be minimal and temporary.

Mitigation

Air quality impacts are anticipated to be non-substantive; therefore, no mitigation is proposed.

6.5.2 Water Quality

A desktop analysis using published information was conducted of the proposed Project area to initially identify wetlands and protected waterways. Wetlands and protected waterways within the proposed Project area were confirmed by Tetra Tech biologists during a field inspection using the United States Army Corp of Engineers (USACE) routine determination methodology on May 14 through 16, and August 13, 2008. A map depicting the approximate locations of the wetlands and water features is included as Figure 9 (Tiles 1 and 2). This map includes National Wetland Inventory (NWI) mapping,

Minnesota Protected Waters and Wetlands Map information, and annotation based on the field inspections.

Waterways

Public waters are water basins and watercourses in Minnesota with significant recreational or natural resource value as defined by Minnesota Statute 103G.005. The Minnesota Department of Natural Resources (MDNR) has regulatory jurisdiction over these waters. The Project area is located outside the Heron Lake Watershed District to the south and east and would fall within the jurisdiction of the Jackson County Soil and Water Conservation District.

According to the MDNR Protected Waters and Wetlands Map (MDNR 1083) the major waterbody is the Des Moines River which flows generally west to east beneath 560th Avenue. A number of drainage ways were observed to be located within the proposed Project area. Five of these drainage ways were determined to have wetland characteristics based on observations of wetland hydrology, hydric soils, and wetland vegetation consisting primarily of sedges (*Carex* spp.) and reed canary grass (*Phalaris arundinacea*). The drainage ways are highly modified for agricultural purposes. Water flow associated with the drainages typically flows under the road way through a culvert and in some instances shows considerable bank erosion.

The MDNR map indicates that an intermittent stream approximately 0.5 mile north of the Tatman Project Substation along County Highway 25 is a protected waterway. However, during the field inspection, no defined drainage way or wetland vegetation was observed and the field was planted in corn. For those reasons, this area is not included as a water feature on Figure 9.

Wetlands

Wetlands are recognized by three parameters: wetland hydrology, hydric soils, and wetland vegetation. Hydric soils are soils that are wet frequently enough to periodically produce anaerobic conditions, thereby influencing the species composition or growth of plants on those soils. Under most circumstances, at least one positive field indicator of each parameter will be apparent at any given wetland. Websoil survey information for the proposed Project area indicates that hydric soils are located within the proposed Project area (NRCS Websoil Survey 2007).

The legal definition of a wetland, as outlined in the 1987 United States Army Corps of Engineers (USACE) Wetlands Delineation Manual is given as follows:

The term “wetlands” means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that 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. (33CFR328.3(b); 1984)

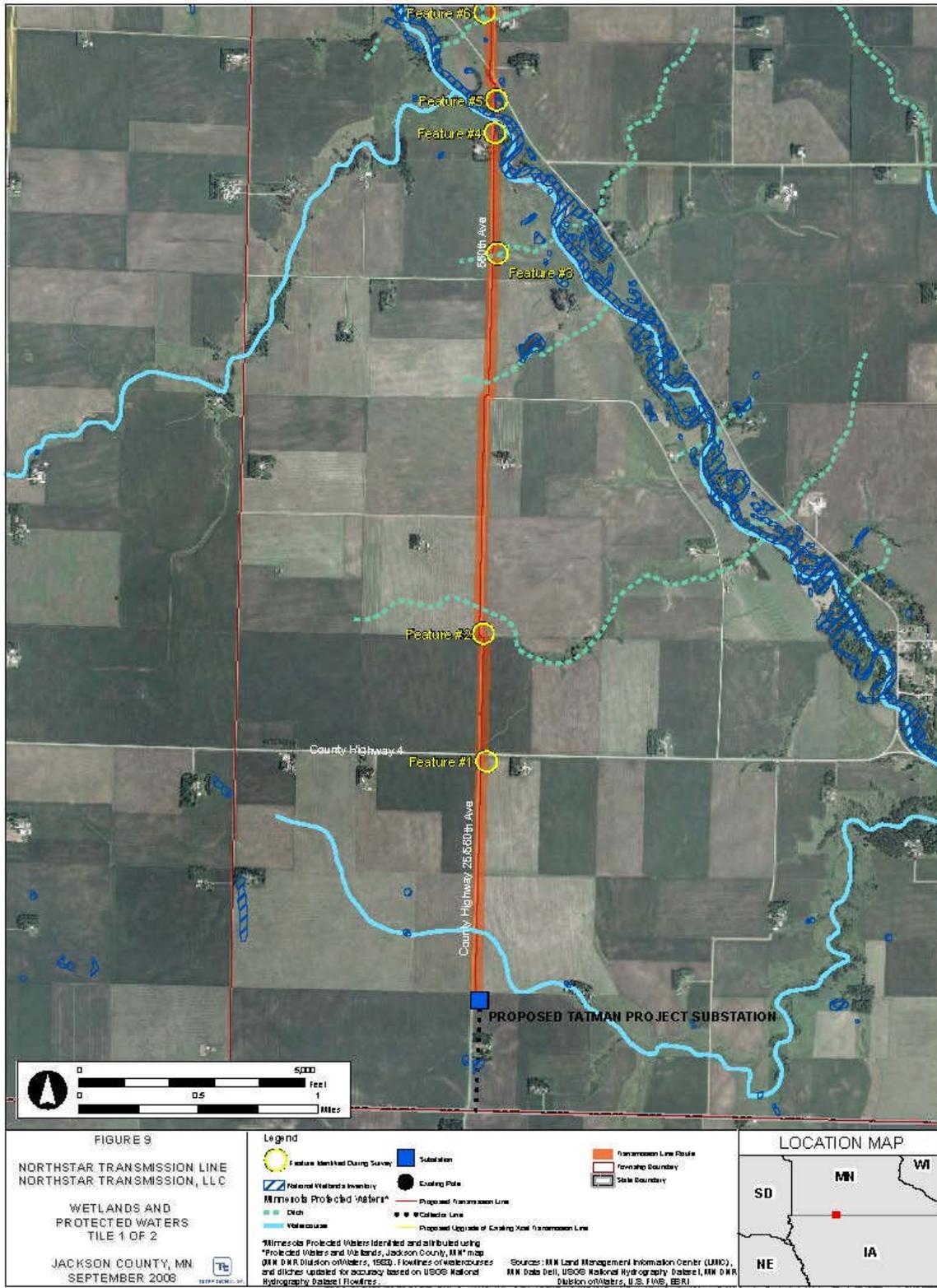


Figure 9 Wetlands and Protected Water Tile 1 of 2

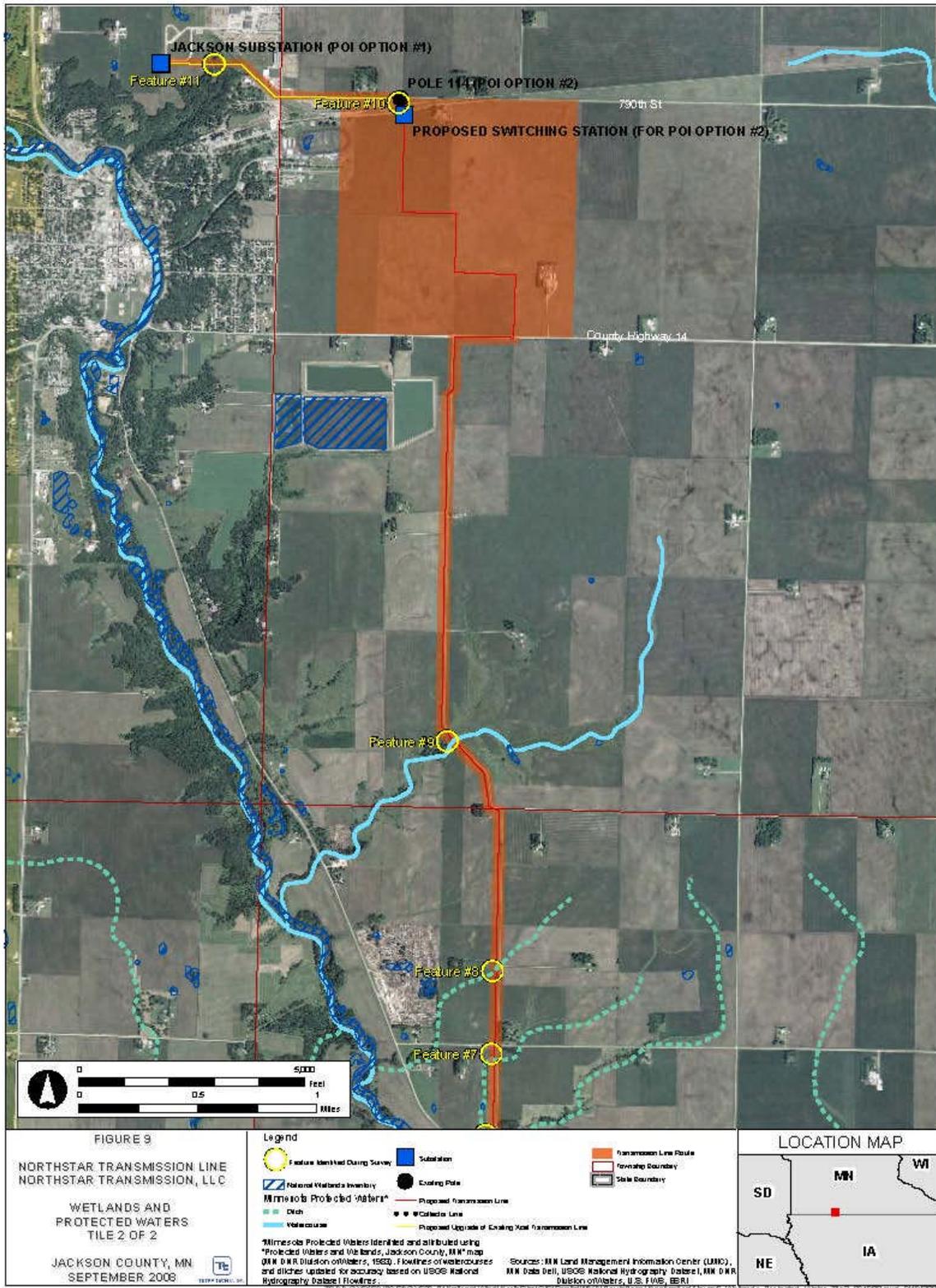


Figure 9 Wetlands and Protected Water Tile 2 of 2

Numerous federal, state, county, and local regulations currently affect construction and other activities in wetlands. The principal laws in Minnesota affecting wetlands and streams are Sections 404 and 401 of the federal Clean Water Act (CWA), the public waters laws administered by the MDNR, and the Minnesota Wetlands Conservation Act (WCA). Section 404 (regulation of discharge of dredge/fill materials into wetlands) is implemented by the USACE. The public waters laws regulate work in public waters, including wetlands listed on the MDNR inventory of protected waters and wetlands. The Minnesota WCA was first passed in 1991. The local government unit (LGU) has the primary responsibility for administration of the WCA and for making key determinations. Generally, the LGU is the local watershed or county. In many instances, both jurisdictions overlap the same wetland feature. The Jackson County Soil and Water Conservation District is the identified LGU for the proposed Project area.

Results of Desktop Analysis and Field Inspection

Tetra Tech prepared a summary of the desktop analysis and field inspection for the public waterways and wetlands features shown on Figure 9. The following is a description of each of the features numbered south to north (one to eleven and the Des Moines River).

Feature 1 is a palustrine emergent, temporarily flooded (PEMA) wetland that was identified at the southeast corner of the intersection of County Highway 25 and County Highway 4 within the ROW. Vegetation was observed to be primarily reed canary grass and sedges. Wetland hydrology was satisfied by standing water and saturation of the soil to the surface. According to the Natural Resources Conservation Service (NRCS), hydric soils present are of the Webster clay loam series.

Feature 2 is a drainage ditch located approximately 0.5 mile north of County Highway 4. Observations of the drainage suggest that it has been modified for agricultural purposes and currently contains reed canary grass and sedges. Water flow associated with the drainage flows under the road way through a culvert.

Feature 3 is a drainage ditch located approximately two miles north of County Highway 4. Observations of the drainage way suggest that it has been modified for agricultural purposes and currently contains reed canary grass. Water flow associated with the drainage flows under the road way through a culvert.

Feature 4 represents two shallow marsh wetlands located on the east side of 560th Avenue just south of the Des Moines River that were identified by the NWI. NWI mapping identified the wetland boundaries for both of the wetlands inside the proposed Project route. During the site visit, wetland vegetation, hydrology, and hydric soils were observed inside the transmission route in these locations.

The Des Moines River (located between features four and five) and the proposed Project area intersect in the Southwest Quarter of Section 8, Township 101 North, Range 34 West, just south of County Highway 23 and the 560th Street intersection. The Des Moines River falls under the jurisdiction of the USACE and will also require Public Utility Crossing licenses from the MDNR Division of Lands and Minerals.

Feature 5 represents a palustrine forested, broad-leaved, deciduous, seasonally flooded wetland and a palustrine emergent, seasonally flooded wetland within the transmission line route east of 560th Avenue along the northern bank of the Des Moines River that were identified by the NWI. During the field reconnaissance field biologists used the wetlands criteria of hydric soils, hydrology, and wetland vegetation to confirm the presence of wetlands in these locations. The vegetation observed was primarily reed canary grass, sedges, red maples (*Acer rubrum*), and cottonwoods (*Populus* spp.). According to the NRCS Jackson County Soil Survey, the hydric soils present are of the Coland loam series.

Feature 6 is identified as a drainage ditch located approximately 0.5 mile north of the Des Moines River. Observations of the drainage way suggest that it has been modified for agricultural purposes and currently contains reed canary grass and sedges. Water flow associated with the drainage flows under the road way through a culvert.

Feature 7 is identified as a drainage ditch located approximately one mile north of the Des Moines River. Observations of the drainage way suggest that it has been modified for agricultural purposes and currently contains reed canary grass and sedges. Water flow associated with the drainage flows under the road way through a culvert.

Feature 8 is identified as a drainage ditch located approximately 1.5 miles north of the Des Moines River. Observations of the drainage way suggest that it has been modified for agricultural purposes and currently contains reed canary grass and sedges. Water flow associated with the drainage flows under the road way through a culvert.

Feature 9 is an intermittent stream located just north of 760th Street. According to the MDNR Protected Waters and Wetlands Map (DNR 1983) the stream is designated as a Protected Water. The stream was observed to contain flowing water, reed canary grass, and sedges.

Feature 10 is a palustrine emergent, temporarily flooded wetland (PEMA) identified just south of the railroad tracks located in the north half of Section 19, Township 102 North, Range 34 West. Wetland hydrology was observed at this location. According to the NRCS, the soils are of the Crippin Clay Loam series, and hydric soils of the Canisteo-Glencoe depressional complex series are adjacent. Willows (*Salix* spp.), sedges, and reed canary grass were observed.

Feature 11 is a deep ravine with flowing water observed near the Jackson substation below the existing Xcel Energy transmission line between transmission pole #104 and pole #105. The ravine is spanned by the existing Xcel Energy transmission line.

Impacts

The wetlands and public waters and potential impacts are presented in Table 6-5. The wetland areas directly adjacent to the Des Moines River fall within the jurisdiction of the USACE and permanent impacts may be unavoidable. Because the wetland associated with Feature 5 extends 540 feet along the Project route along 560th Avenue, it may be necessary to install two poles within this area; however, the Applicant will endeavor to design the transmission line to reduce or eliminate the structures within Feature 5. If two pole installations are necessary, the result would be approximately six square feet of permanent impacts. The clearing of trees (red maples and cottonwoods) for maintaining the reliability of the transmission line in this area is anticipated to be 16 feet within the road ROW and 50 feet within the transmission line route resulting in 36,720 square feet of clearing impacts.

**Table 6-5
Wetlands and Public Waters Summary Table**

Wetland Feature	Type ^{1,2}	Dominant Vegetation	Approximate linear feet crossed by T-line Route	US Army Corps Jurisdiction	Minnesota Department of Natural Resources Jurisdiction	Jackson County Soil and Water Conservation District Jurisdiction	Permanent Impact (sq/ft)	Clearing Impact (sq/ft)
Feature 1	Type 1, PEMA	Reed canary grass, sedges, curly dock	40'	No	No	Yes	None	None

**Table 6-5
Wetlands and Public Waters Summary Table**

Wetland Feature	Type ^{1,2}	Dominant Vegetation	Approximate linear feet crossed by T-line Route	US Army Corps Jurisdiction	Minnesota Department of Natural Resources Jurisdiction	Jackson County Soil and Water Conservation District Jurisdiction	Permanent Impact (sq/ft)	Clearing Impact (sq/ft)
Feature 2	Drainage ditch	Reed canary grass, sedges, horsetail	40'	No	No	No	None	None
Feature 3	Drainage ditch	Reed canary grass	20'	No	No	No	None	None
Feature 4	Two Type 3, PEMC	Reed canary grass, sedges	40'	Yes	Yes	Yes	None	None
Des Moines River	Open Water	None	120'	Yes	Yes	Yes	None	None
Feature 5	Type 3, PEMC & Type 7, PFO1C	Reed canary grass, sedges, red maple, cottonwood	540	Yes	Yes	Yes	6 (due to pole placement)	36,720
Feature 6	Drainage ditch	Reed canary grass, sedges	40'	No	No	No	None	None
Feature 7	Drainage ditch	Reed canary grass, sedges	30'	No	No	No	None	None
Feature 8	Drainage ditch	Reed canary grass, sedges	30'	No	No	No	None	None
Feature 9	Intermittent stream	Reed canary grass, sedges	75	No	Yes	No	None	None
Feature 10	Type 1, PEMA	Reed canary grass, sedges, willows	100'	No	No	Yes	None	None
Feature 11	Ravine	Reed canary grass	200	Yes	No	Yes	None	None

¹ Type from Cowardin *et al.*, (1979):

PEMA: Palustrine Emergent, Temporarily Flooded

PEMC: Palustrine Emergent, Seasonally Flooded

PFO1C: Palustrine Forested, Broad-Leaved Deciduous, Seasonally Flooded

² Minnesota Department of Natural Resources

Type 1: Seasonally flooded basin or flat

Type 3: Shallow Marsh

Type 7: Wooded Swamp

There will be no pole or clearing impacts associated with the remaining wetlands and public water features.

Potential temporary water quality impacts could result from installation of the transmission line and construction of the Tatman Project Substation and the switching station due to soil exposure during

clearing, excavation, and grading activities. These impacts would be minimized by using standard engineering Best Management Practices such as installing silt fences, check dams, using low-tracked vehicles and temporary matting, as appropriate. Since the construction area will be greater than one acre, a Construction Storm Water National Pollution Discharge Elimination System (NPDES) permit would be required from the Minnesota Pollution Control Agency (MPCA), including submittal of a storm water pollution prevention plan (SWPPP). All areas disturbed by construction would be revegetated or replanted with crops per negotiations with property owners. No permanent water quality impacts are anticipated to result from the Proposed Project.

Mitigation

Prior to construction activities, the District Engineer for the USACE would need to be notified with a preconstruction notification (PCN) authorized under the USACE St. Paul District Regional General Permit (RGP-03-MN) under part G – Structural Discharges. In addition, an application would need to be filed with the Jackson County Soil and Water Conservation District (SWCD) to determine if the Proposed Project would impact any wetlands or public waters under local jurisdiction of the SWCD.

6.5.3 Flora and Fauna

Tetra Tech conducted a site visit of the proposed Project area on May 14, 2008 through May 16, 2008. As described in Section 6.1, the areas adjacent to the proposed Project transmission line route, Tatman Substation, and switching station are primarily located in rural residential/agricultural land uses; therefore, native vegetation that would be useful for wildlife habitat would be minimally affected.

The proposed transmission line route is located directly adjacent to existing roadways, or within agricultural fields, wetlands, or floodplains associated with the Des Moines River (Figure 9). Existing vegetation adjacent to roadways consists primarily of grass species (*Carex* spp.) and invasive weeds with the exception of a few cottonwood trees that would need to be removed prior to construction activities. Several wetland areas were identified in the proposed Project area as discussed in Section 6.5.2 of this application. Vegetation in the wetlands and floodplain areas noted adjacent to the Des Moines River crossing consists primarily of sedges and reed canary grass, as well as some red maples and cottonwoods.

There would be some loss of wildlife habitat in the areas where existing fence row trees/shrubs and ditch herbaceous vegetation would need to be cleared or reduced for the transmission line route. However, the total habitat area lost due to transmission line installation would be limited to pole locations, and most of the land is in agricultural use or existing ROW, which does not contain unique vegetation or special wildlife habitat. The majority of potential vegetation impacts would be at the Des Moines River crossing.

Wildlife that inhabits non-agricultural areas affected by ROW clearing may relocate to adjacent, undisturbed fence row or ditch areas within the Project area. Grass, shrub and low-growing (less than 25 feet tall) vegetation would revegetate the ROW following initial clearing, as described in Section 5.2. Overall, Project impacts to wildlife habitat would be minimal since the route will primarily be constructed along an existing road ROW. Additionally the animals that reside in the affected habitat will be typical of those found in agricultural settings and it is anticipated they will not be affected at a population level. Included in Table 6-6 is a listing of wildlife species that were observed in the vicinity of the proposed Project area during the site visit.

**Table 6-6
 Wildlife Species**

Common Name	Scientific Name
Birds	
American crow	<i>Corvus brachyrhynchos</i>
American robin	<i>Turdus migratorius</i>
Baltimore oriole	<i>Icterus galbula</i>
Blue jay	<i>Cyanocitta cristata</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Common grackle	<i>Quiscalus quiscula</i>
Horned lark	<i>Eremophila alpestris</i>
House sparrow	<i>Passer domesticus</i>
Killdeer	<i>Charadrius vociferus</i>
Mourning dove	<i>Zenaidura macroura</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Song sparrow	<i>Melospiza georgiana</i>
Spotted sandpiper	<i>Actitis hypoleucos</i>
Upland sandpiper	<i>Bartramia longicauda</i>
White-throated sparrow	<i>Zonotrichia albicollis</i>
Mammals	
Meadow vole	<i>Microtus pennsylvanicus</i>
White-tailed deer	<i>Odocoileus virginianus</i>
Reptiles and Amphibians	
Northern leopard frog	<i>Rana pipiens</i>
Smooth softshell turtle	<i>Apalone mutica</i>
Snake <i>spp.</i>	<i>Unknown spp.</i>

There is a potential for avian collisions with transmission lines. Collisions tend to occur more frequently when the lines are in close proximity to wetlands, open water or within a major migratory bird flyway used by raptors, waterfowl and cranes. As shown on Figure 9, there are some wetlands and open waters located in the vicinity of the proposed Project area. Some of the bird species that were encountered during the site visit were primarily observed within the wooded areas near farmsteads or near the Des Moines River crossing, not within the proposed Project route. Given the narrow width of the Des Moines River, the presence of woody vegetation overgrowing most of the wetlands, and the lack of large expanses of open water; the area would not be considered a major area of use by migratory birds. Furthermore, two existing overhead power lines and two radio/telecommunication towers were observed within or in close proximity of the proposed Project area. Because of the existing wetland conditions, we do not anticipate a substantial risk to avian species from the proposed transmission lines.

Electrocution of raptors is a concern. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. The transmission lines for this Project will provide adequate spacing to eliminate risk of electrocution. With such a precaution taken electrocution is not a concern for the Proposed Project. Additional impacts may occur if resident raptors

build nests on transmission line structures. No raptors were observed in the proposed Project area during a site visit on May 14-16, 2008. USFWS recommends that potential for bird electrocutions and bird strikes, in areas where overhead lines are constructed, be reduced through implementation of measures outlined in “Suggested Practices for Raptor Protection on Power Lines” (Edison Electric Institute 1996) and “Mitigating Bird Collisions with Power Lines: The State of the Art in 1994” (Edison Electric Institute 1994), or more recent versions if available. This Project will address these guidelines in areas where raptor electrocution may occur.

Mitigation

No mitigation is proposed because the Proposed Project impacts to vegetation/habitat and wildlife in the proposed Project area are anticipated to be minimal and temporary. No substantive impacts to wildlife populations are anticipated.

6.6 Rare and Unique Resources

The MDNR and the United States Fish and Wildlife Service (USFWS) were contacted to identify state and federally listed threatened and endangered species within the Project area. Agency responses are attached in Appendix E. Table 6-7 lists rare or unique resources identified within one mile of the Project area. Rare and unique resources were identified using the MDNR Natural Heritage Database (NHIS). NHIS information is often based on opportunistic sightings. Table 6-7 lists the likelihood for each listed species to occur in the Project area based on habitat assessments performed during the site visit on May 14-16, 2008.

**Table 6-7
Rare and Unique Resources Potentially Occurring Near the Proposed Project Area**

Species	Scientific Name	Status	Likelihood of Occurrence in Proposed Project Area	Habitat Association
BIRDS				
Loggerhead Shrike	<i>Lanius ludovicianus</i>	State Threatened	Low	Feeds primarily on large insects, also other invertebrates, small birds, lizards, frogs, and rodents; sometimes scavenges. Nests in open country with scattered trees and shrubs, savanna, and, occasionally, open woodland; often perches on poles, wires or fenceposts.
MOLLUSKS				
Mucket	<i>Actinonaias ligamentina</i>	State Threatened	Low	Usually found in medium to large rivers with fairly good flow. Generally inhabits sand and/or gravel substrates.
Round Pigtoe	<i>Pleurobema coccineum</i>	State Threatened	Low	Generally widespread from small to large rivers. Inhabits substrates that include mud, sand, and gravel with moderate flows.
Monkeyface	<i>Quadrula metanevra</i>	State Threatened	Low	Usually found in medium to large rivers. Generally inhabits sand and/or gravel substrates.
Spike	<i>Elliptio dilatata</i>	State Species of Concern	Low	Generally found in small to large streams and occasionally lakes. Inhabits substrates that include mud or gravel.
Black Sandshell	<i>Ligumia recta</i>	State Species of Concern	Low	Generally found medium to large rivers in riffles or raceways. Inhabits firm sand or gravel substrates..
PLANTS				

Species	Scientific Name	Status	Likelihood of Occurrence in Proposed Project Area	Habitat Association
Sullivant's Milkweed	<i>Asclepias sullivantii</i>	State Threatened	Low	Occurs in moist remnant mesic prairies on moist sandy clay or sandy loam soils, and occasionally in disturbed habitats such as oil fields.
Snow Trillium	<i>Trillium nivale</i>	State Species of Concern	Low	Occurs among dried leaves in woodlands along streams and rivers, and in ravines where the soil is very thin over limestone or dolomite bedrock.
Prairie Bush Clover	<i>Lespedeza leptostachya</i>	Federally Threatened Species	Low	Typically found in gravelly soil in dry to mesic prairies.
PLANT COMMUNITIES				
Mesic Prairie	N/A	N/A	Low	N/A

The MDNR NHIS identified three remnant mesic prairie areas adjacent to the Iowa, Chicago and Eastern Railroad track in the northern section of the Project area. The remnant prairie areas are located in Township 102 North, Range 3 West, Section 18 and Section 19. Prairie land was once abundant in this area of Minnesota. Approximately 99 percent of the prairie that was present in the state before settlement has been destroyed. Sullivant's milkweed (*Asclepias sullivantii*), a state-listed threatened species, was identified by the MDNR and has been observed within the remnant prairie areas.

An email from the USFWS dated June 26, 2008 stated the USFWS has no easements or other land interests in the Project area. The proposed transmission line will pass directly over the Des Moines River, a state mussel survey site. The Project area also passes through potential prairie bush clover (*Lespedeza leptostachya*) sites, a federally listed threatened species. The prairie bush-clover is typically found in gravelly soil in dry to mesic prairies.

Tetra Tech field biologists conducted a site visit of the proposed Project area on May 14, 2008 through May 16, and August 12, 2008. The remnant prairie areas were observed to be to the east of the Project area. No Sullivant's milkweed or prairie bush clover was observed. Therefore, the Applicant does not anticipate the Proposed Project to impact rare and unique resources.

Many of the rare and unique resources identified with the Project area are aquatic mussel species associated with the Des Moines River. The Applicant will attempt to span any rivers, streams, or other waterbodies avoiding impact to aquatic organisms.

Mitigation

The Applicant anticipates that no mitigation will be necessary as no rare and unique resources were observed within the Project area during the site visit. The Applicant contacted the USFWS and indicated the Proposed Project as described will not adversely affect the prairie bush clover. In a response email dated June 30, 2008, the USFWS concurred with the determination of "no effect," and stated they had no further concerns regarding the Project. The correspondence is presented in Appendix C.

7.0 AGENCY AND PUBLIC CONTACTS

7.1 Agency Contacts

7.1.1 Minnesota Department of Natural Resources

The Minnesota DNR Natural Heritage and Nongame Research Program were contacted to request their review of the Minnesota Natural Heritage database for listings of state threatened and endangered species and rare natural features located within the Project area. In the DNR's July 28th response letter (see Appendix B) they identified several species that have been recorded as occurring within one mile of the Project route (Section 8.6). As stated in the response, only one of the eight species identified in the Minnesota DNR response has the potential to be adversely affected by the Proposed Project (Section 8.6).

7.1.2 Jackson County

Coordination discussions were held between Northstar Transmission, LLC, National Wind, and Tetra Tech May 7, 2008 regarding potential shared use of County Highway 25 and crossing County Highways 4 and 14.

7.1.3 Minnesota State Historic Preservation Office (SHPO)

A letter was sent to SHPO requesting their review of the Minnesota Archaeological Inventory and Historic Structures Inventory database for the Project area for previously-known resources that could potentially be impacted by the Proposed Project. Their response to this request was received via e-mail on May 6, 2008 (see Appendix B). Their search revealed no previously-known resources within the Project area.

7.1.4 United States Fish and Wildlife Service

An inquiry was sent to the United States Fish and Wildlife Service (USFWS) on May 21, 2008 to identify federally listed species within the Project route. USFWS identified a state mussel survey site within the route; however, indicated that impacts could be avoided by spanning or boring underneath the creek. USFWS also identified the potential for suitable habitat for the prairie bush clover (*Lespedeza leptostachya*). Environmental field work conducted May 14-16 did not identify habitat for the prairie bush clover. This determination was sent to USFWS via email on June 29, and in a response email on June 30, USFWS concurred with the "no effect" determination (Appendix C).

7.2 Adjacent Landowners

Appendix A includes a list of all landowners located along the proposed transmission line route defined in this permit application.

8.0 FACTORS TO BE CONSIDERED BY THE COMMISSION

Minnesota Rules 7849.5910 established 14 factors to be considered by the PUC when determining whether a permit should be granted for a proposed high voltage transmission line. This section discusses these factors as they relate to the Proposed Project.

8.1 Effects on Human Settlement, Including, But Not Limited to, Displacement, Noise, Aesthetics, Cultural Values, Recreation, and Public Services

The Proposed Project would not result in displacement of existing residences or businesses (see Section 4.4.1.2). A strip of private land almost eight miles long and 50 feet wide has been acquired for overhang easements from landowners. Additional easements would be acquired across County and private

properties for placement and overhang of power poles. The Proposed Project is consistent with cultural values for the area based on the Jackson County Development Code (see Section 6.2.6). Impacts related to noise (see Section 6.2.3), aesthetics (see Section 6.2.4) and recreation (see Section 6.2.7) would not be substantial. The Proposed Project would not result in an increased need for public services (see Section 6.2.8).

8.2 Effects on Public Health and Safety

No public health or safety effects are anticipated to result from the Proposed Project. The proposed 161 kV transmission line would generate a maximum electric field of approximately 0.76 kV/m at a location of ten feet from the centerline, one meter off the ground. This is substantially less than the 8 kV/m standard defined by the PUC. With respect to electromagnetic fields, no scientific studies to date have found a statistically significant link between electromagnetic field generation and health effects.

8.3 Effects on Land-based Economies, Including, but not limited to, Agriculture, Forestry, Tourism, And Mining

As described in Sections 6.3.1 through 6.3.4, the Proposed Project would result in no impacts to forestry, tourism or mining. Agricultural impacts from the transmission line route would be minimal since the transmission line would be located within existing public utility, roadway or other ROWs and/or along fence rows of agricultural land, minimizing potential impacts to farming operations. No agricultural fields would be bisected by the proposed transmission route, with the exception of the northernmost 1.5 miles, which follows property boundaries through existing agricultural fields. Farmland impacts within the new transmission route would be limited to pole placement within field production areas; the impact area would be limited to the footprint of the poles. Farming operations would be allowed to continue between the poles.

The proposed Tatman Project Substation would be located on a 9 acre parcel that is currently used by the Jack Tatman Trust for agricultural purposes. Approximately 2.5 acres at the northwest corner of this parcel would be needed for construction of the substation. The remainder of the parcel could continue to be used for agricultural production or future development. The proposed switching station near the POI with the Xcel Energy line would require approximately 2.5 acres of the Fairland Management Company property; however, the remainder of the property could continue to be used for agricultural production.

8.4 Effects on Archaeological and Historic Resources

The Proposed Project is not anticipated to impact any archaeological or historic resources. There were several historic resources identified within a one-mile of the Proposed Project along the Xcel Line (see Section 6.4.3). During the Phase IA survey, two archaeological sites requiring additional fieldwork were also identified in the proposed Project area (see Section 6.4.2). These include portions of Sections 7, 8, and 17, in T101N, R34W, adjacent to the Des Moines River; and Section 31 in T102N, R34W adjacent to an unnamed stream. Prior to the completion of additional fieldwork to assess these sites, the Minnesota SHPO would be consulted regarding subsurface testing methods. The potential for impacts to any buried archaeological resources from the transmission poles is relatively small, since the potential impact area is limited to the footprints of the individual poles.

8.5 Effects on the Natural Environment, Including Effects on Air and Water Quality Resources and Flora and Fauna

As discussed in Section 6.5, no substantive effects on the natural environment are anticipated to result from the Proposed Project. Air quality impacts would be non-substantive. Potential temporary water quality impacts would be limited to soil exposure during clearing, excavation and grading activities. Preparation and implementation of a SWPPP, as required by NPDES permitting, and use of standard Best Management Practices would ensure that no permanent water quality impacts result from the Proposed Project. Therefore water quality impacts would be minimal and temporary.

Minor wetland impacts may occur during transmission pole installation. The wetland areas directly adjacent to the Des Moines River fall within the jurisdiction of the USACE, the MDNR and the Jackson County Soil and Water Conservation District. It may be necessary to install poles in the two identified jurisdictional wetlands adjacent to the Des Moines River on the north side. Each pole installation would be a permanent impact on the wetlands of an area of approximately six square feet. Additionally, there would be clearing required to remove tall growing trees in those wetlands (36,570 square feet). Unavoidable wetland impacts are anticipated to be minimal and would not exceed the thresholds as set forth by the RGP-03-MN.

8.6 Effects on Rare and Unique Natural Resources

As indicated in Section 6.5.3, the impacts to vegetation/habitat and wildlife in the proposed Project area are anticipated to be minimal and temporary. There would be some loss of wildlife habitat in the areas where existing fence row trees/shrubs and ditch herbaceous vegetation would need to be cleared or reduced for the transmission line route. However, the total habitat area lost would be relatively small since most of the land is in agricultural use and is not unique vegetation or special wildlife habitat. Wildlife that inhabits non-agricultural areas affected by clearing of the transmission line route likely would relocate to adjacent undisturbed fence row or ditch areas. Grass, shrub and low-growing (less than 25 feet tall) vegetation would revegetate the transmission line route following initial clearing. Therefore, no substantive impacts to wildlife populations are anticipated. The Minnesota DNR identified eight state-listed species and one native prairie type in the area of the proposed transmission line and facilities shown in Table 8-1. The Project is not likely to affect any of the species identified by Minnesota DNR.

Table 8-1
Minnesota DNR Species Recorded Within One Mile Radius of the Project Route

Common Name	Scientific Name	State Status	Negative Impact
mucket	<i>Actinonaias ligamentina</i>	Threatened	No
Sullivant's milkweed	<i>Asclepias sullivantii</i>	Threatened	No
spike	<i>Elliptio dilatata</i>	Special Concern	No
loggerhead shrike	<i>Lanius ludovicianus</i>	Threatened	No
black sandshell	<i>Ligumia recta</i>	Special Concern	No
mesic prairie (southern) type	N/A	N/A	No
round pigtoe	<i>Pleurobema coccineum</i>	Threatened	No
monkeyface	<i>Quadrula metanevra</i>	Threatened	No
snow trillium	<i>Trillium nivale</i>	Special Concern	No

8.7 Application of Design Options that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects, and Could Accommodate Expansion of Transmission or Generating Capacity

The proposed Northstar Transmission Line has been designed to follow the shortest distance from the wind farm to the POI while also using existing ROW and transmission infrastructure whenever possible. The line was engineered to both support the maximum 200 MW output of the Northstar Wind Farm. The line could eventually become a part of the MISO grid, as opposed to a radial line, if it were to be expanded to the south, east or west and connected to other MISO lines.

8.8 Use or Paralleling of Existing Rights-Of-Way, Survey Lines, Natural Division Lines, and Agricultural Field Boundaries

The Proposed Project locates transmission lines for the most part within or directly adjacent to existing utility, roadway or other public ROWs, and it includes power pole sharing with local distribution lines for approximately one-fifth of the route. Additionally, from structure 114 to the Jackson Substation, the transmission line would be collocated on a single double circuit structure with the Xcel transmission line for a distance of one mile. As indicated in Section 4.5.1.1, appropriate easements acquired for pole placement and overhang would result in minimal impacts that would not affect existing or future use of adjacent parcels.

8.9 Use of Existing Large Electric Power Generating Plant Sites

The wind farm is a new generation asset in a land area that is not currently used to generate power. We are pleased to be able to deliver 200 MW of community owned wind energy towards Minnesota's Renewable Portfolio Standard.

8.10 Use of Existing Transportation, Pipeline, and Electrical Transmission Systems or Rights-Of-Way

The Proposed Project locates transmission lines for the most part within or directly adjacent to existing utility, roadway or other public ROWs, and it includes power pole sharing with local distribution lines for approximately one-third of the route. As indicated in Section 4.5.1.1, appropriate easements acquired for pole placement and overhang would result in minimal impacts that would not affect existing or future use of adjacent parcels.

8.11 Electrical System Reliability

Northstar Transmission, LLC's 200 MW injection will be a Network Resource and will require network upgrades. The upgrades are currently being studied by MISO and the transmission owners. Northstar Transmission, LLC's off-takers have also filed Transmission Service Requests for delivery of their portion of the 200 MW and will be paying for their own required network upgrades. The combined network upgrades will ensure system reliability and deliverability.

8.12 Costs of Constructing, Operating, and Maintaining the Facility which are Dependent on Design and Route

The proposed routing and system design reflect design decisions made to minimize construction, operation and maintenance costs, to the extent practicable, including:

- Route locations that minimize the length of transmission line required, thereby minimizing installation and maintenance costs;

- Use of roadway ROWs and sections parallel to existing utility and other public ROWs to minimize land acquisition and system maintenance costs;
- Use of standard pole materials and configurations requiring standard construction and maintenance practices.

Northstar Transmission, LLC estimates that the transmission line and substations will cost approximately \$10.1 to \$10.2 million. The annual operating and maintenance expenses will be primarily inspection costs, which will be between approximately \$5,000 and \$10,000 per year.

8.13 Adverse Human and Natural Environmental Effects which cannot be Avoided

Impacts to the human and natural environment have been avoided and minimized, to the extent feasible, in project siting and design. The unavoidable adverse human and environmental impacts identified as potentially resulting from the Proposed Project are minimal. Construction would result in short-term, temporary impacts, primarily related to soil disturbance and woody vegetation cutting. Longer-term impacts that cannot be avoided include acquisition and conversion of land from existing rural agricultural uses to substation and transmission line uses. However, the proposed route is located within existing public utility, roadway or other ROWs and/or along fence rows of agricultural land, minimizing potential impacts to farming operations. Construction of the proposed 161 kV transmission line would be scheduled to avoid conflicts with seasonal tillage, planting, and harvesting of agricultural crops wherever possible. The visual impacts of the transmission line, substation, and switching station would be long-term. However, the transmission line would be located primarily along roadway/utility ROWs, and transmission and distribution lines would be collocated. There are no distinctive landscape features in the Project area that would require specific protection from visual impact.

8.14 Irreversible and Irretrievable Commitments of Resources

Irreversible effects apply to those resources affected by the Proposed Project that cannot be replaced within a reasonable timeframe. Irretrievable commitment of resources relates to resources affected/used that cannot be restored. Irreversible and irretrievable effects resulting from implementation of the Proposed Project would be primarily related to construction. The transmission lines, substation, and switching station are created from non-renewable materials, such as steel for poles, metals and other materials for transmission lines, conductors, and substations, as well as concrete and crushed rock, which, for the foreseeable future, would be irreversibly committed to the Proposed Project. Fuel consumed during Project construction and maintenance also would be irreversibly and irretrievably committed to the Proposed Project. Land occupied by the substation, switching station, and transmission poles would be irreversibly committed to use for the Proposed Project for the foreseeable future. Although the materials and land used for the Proposed Project could be “retrieved” in the future as recycled materials and by converting the land back to former uses, it is not likely to occur, since the Proposed Project would remain in service for the foreseeable future. The commitment of these resources is based on the benefit derived from the expansion and improved reliability of service that would result from construction of the Proposed Project. This benefit would outweigh the irreversible and irretrievable commitment of resources.