NORTHERN STATES POWER COMPANY APPLICATION TO THE MINNESOTA PUBLIC UTILITIES COMMISSION FOR A ROUTE PERMIT

SOUTHWEST TWIN CITIES ("SWTC") 115 KV TRANSMISSION LINE UPGRADES TO THE GLENCOE – WACONIA 69 KV SYSTEM

Alternative Permitting Process
PUC Docket No. E002/TL-10-249

DECEMBER 10, 2010

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1.0 EXECUTIVE SUMMARY

1.1 PROPOSAL SUMMARY

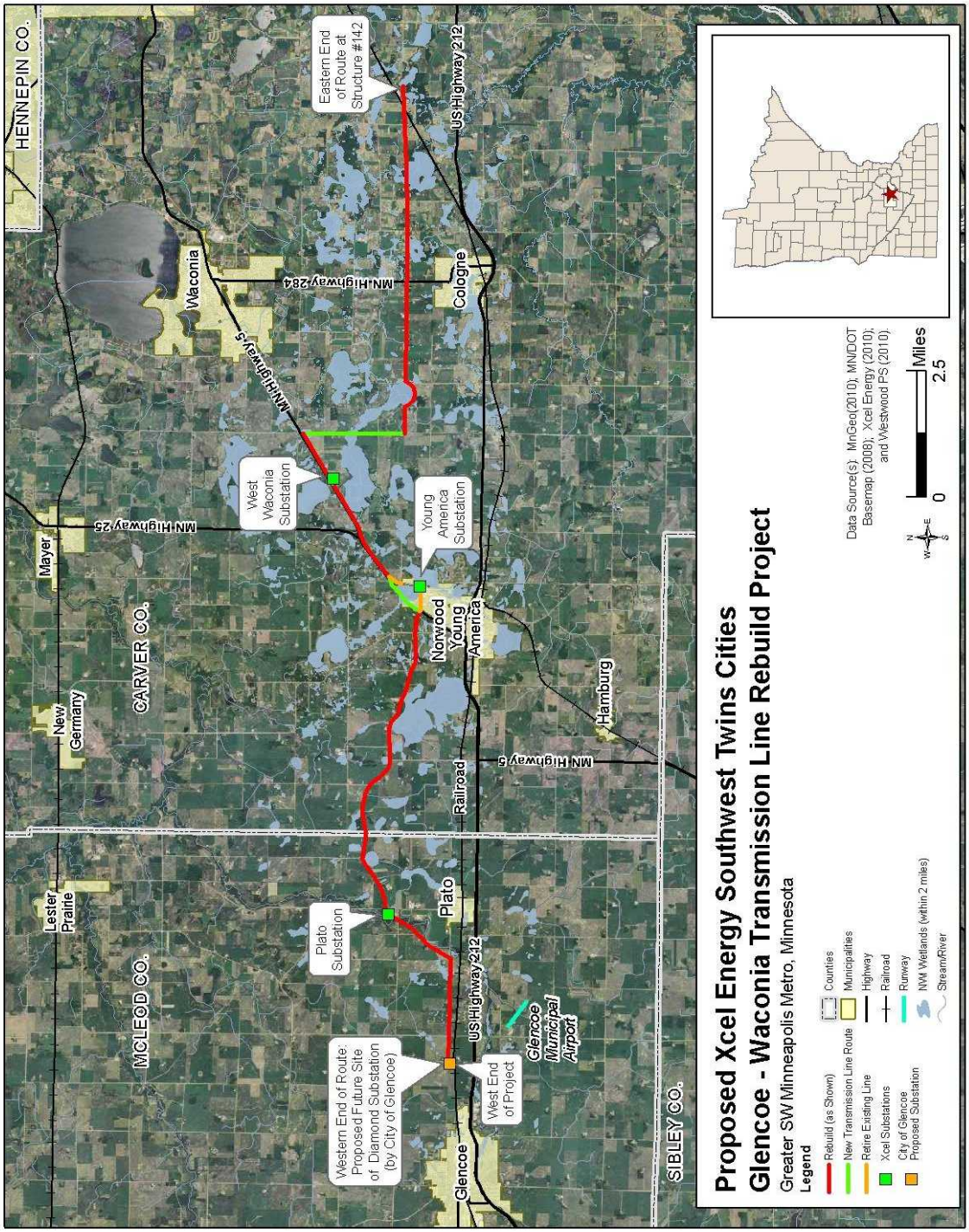
Northern States Power Company, a Minnesota Corporation ("Xcel Energy", "Applicant" or the "Company") submits this application ("Application") for a Route Permit to the Minnesota Public Utilities Commission ("MPUC", "Minnesota PUC" or "Commission") pursuant to Minnesota Statutes Section 216E and Minnesota Rules Chapter 7850.

A Route Permit is requested to construct approximately 0.9 mile of new 115 kilovolt ("kV") transmission line, 1.9 miles of new 69 kV transmission line that is capable of operating as 115/69 kV double circuit line and upgrade approximately 20.2 miles of 69 kV transmission line to 115 kV or double circuit 115/69 kV capacity (approximately 23 miles total) near the cities of Glencoe, Plato, Norwood Young America and Waconia located southwest of the Twin Cities metro area (the "Project"). Approximately 3.6 miles of the total proposed Project miles will consist of 115/69 kV double circuit transmission line. Figure 1 shows the proposed Project.

Minnesota Statutes Section § 216E.04 and Minnesota Rules 7850.2800 to 7850.3900 provide for an Alternative Permitting Process for certain high voltage transmission line ("HVTL") facilities. The proposed new 115 kV transmission line and proposed rebuild of the 69 kV transmission line to a 115/69 kV double circuit transmission line with associated facilities, qualify for consideration under the Alternative Permitting Process because the proposed new and upgraded transmission lines are between 100 and 200 kV. Minn. Stat. § 216E.04, subd. 2(3); Minn. R. 7850.2800, Subp. 1(C) (authorizing alternative process for HVTLs between 100 and 200 kV). This Application is submitted pursuant to the Alternative Permitting Process outlined in Minnesota Rules 7850.2800 to 7850.3900.

The Applicant requests that the Commission approve the proposed route and authorize a route width of 100 feet on each side of the route centerline of the existing 69 kV facilities (200 feet total width), except along Project route segments involving the construction of proposed new transmission lines where the Applicant requests a route width of 200 feet on each side of the road centerline (400 feet total width).

FIGURE 1
GENERAL VIEW OF PROPOSED PROJECT



1.2 COMPLETENESS CHECKLIST

The content requirements for an application with the Commission under the Alternative Permitting Process are identified in Minnesota Rules 7850.2800 to 7850.3900. The rule requirements are listed in Table 1 with references indicating where the information can be found in this Application.

TABLE 1
COMPLETENESS CHECKLIST

Authority	Required Information	Where
Minn. R. 7850.2800, 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 7850.2800 to 7850.3900 instead of the full permitting procedures in part 7850.1700 to 7850.2700 for high voltage transmission lines of between 100 and 200 kilovolts.	2.4
Minn. R. 7850.2800 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 7850.2800 to 7850.3700, shall notify the PUC of such intent, in writing, at least 10 days before submitting an application for the projects.	2.5 and Appendix A.1
Minn. R. 7850.3100	Contents of Application (alternative permitting process)	
	The applicant shall include in the application the same information required in part 7850.1900, 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.	4.3 (See also 7850.1900, Subp. 2 below)
Minn. R. 7850.1900, Subp. 2 (applicable per Minn. R. 7850.3100)	Route Permit for HVTL	
A.	a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	2.1
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	2.2
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, per Minn. R. 7850.3100

Authority	Required Information	Where
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	3.2, 4.1, 5.1.1
E.	the environmental information required under 7850.1900, Subp. 3	See Minn. R. 7850.1900, Subp. 3 (A)–(H) below
F.	identification of land uses and environmental conditions along the proposed routes	Chapter 6.0
G.	the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	7.2, Appendix E.1
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	Appendix B
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, the land used by a public utility (as for a transmission line), with the proposed line	5.1.2
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	Chapter 5.0
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	3.5 and 5.1.6
L.	a description of possible design options to accommodate expansion of the high voltage transmission line in the future	4.4 and 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	5.1.3 – 5.1.6
N.	a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	7.4
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	2.3
Minn. R. 7850.1900, Subp. 3	Environmental Information	
A.	a description of the environmental setting for each site or route	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	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	6.3
D.	a description of the effects of the facility on archaeological and historic	6.4

Authority	Required Information	Where
	resources	
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	6.5
F.	a description of the effects of the facility on rare and unique natural resources	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	See all of the effects described in Chapter 6.0
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	See all of the mitigative measures identified in Chapter 6.0

2.0 INTRODUCTION

2.1 STATEMENT OF OWNERSHIP

Xcel Energy is a Minnesota corporation with its headquarters in Minneapolis, Minnesota. Xcel Energy is a wholly-owned subsidiary of Xcel Energy Inc., a utility holding company with its headquarters in Minneapolis. Xcel Energy provides electricity services to approximately 1.2 million customers and natural gas services to 425,000 residential, commercial and industrial customers in Minnesota. Xcel Energy Services Inc. is the service company for Xcel Energy and its personnel prepare, submit and administer regulatory applications to the Commission on behalf of Xcel Energy, including route permit applications.

Xcel Energy will build, own and operate the new and upgraded 115 kV single circuit and 115/69 kV double circuit transmission lines between the proposed Diamond Substation (to be owned and built by the City of Glencoe, MN) in McLeod County and the existing structure #142 on line 0740, east of Glencoe and west of the Augusta Substation in Carver County.

2.2 PERMITTEE

The permittee for the proposed Project is:

Permittee: Northern States Power Company, a Minnesota Corporation

Contact: Timothy G. Rogers
Supervisor, Siting and Permitting

Address: Xcel Energy Services Inc.
414 Nicollet Mall, MP-8A
Minneapolis, MN 55401

Phone: (612) 330-1955

E-mail: timothy.g.rogers@xcelenergy.com

2.3 CERTIFICATE OF NEED

Minnesota Statutes Section 216B.243, subd. 2 states that no large energy facility shall be sited or constructed in Minnesota without the issuance of a Certificate of Need ("CON") by the Commission. The 115 kV single circuit and 115/69 kV double circuit transmission lines proposed for the Project is a "large energy facility" because it has a capacity in excess of 100 kV and is more than 10 miles long. The CON docket number is 09-1390. Xcel Energy filed a CON with the Commission on November 30, 2010. Xcel Energy is requesting the CON and Route Permit applications be considered jointly.

2.4 ROUTE PERMIT, ALTERNATIVE PERMITTING PROCESS

The proposed Project involves construction of new 69 kV and 115 kV transmission lines and a proposed rebuild of the 69 kV transmission line to either a 115 kV single circuit or a 115/69 kV double circuit transmission line associated facilities. The Project therefore qualifies for review under the Alternative Permitting Process authorized by Minnesota Statutes Section 216E.04, subd. 2(3) and Minnesota Rules 7850.2800, Subp. 1(C) (establishing alternative process for HVTLs between 100 and 200 kV). Accordingly, Xcel Energy is following the provisions of the Alternative Permitting Process outlined in Minnesota Rules 7850.2800 to 7850.3900 for this Project.

2.5 NOTICE TO THE COMMISSION

Xcel Energy notified the Commission on March 12, 2010, by letter (mailed and electronically filed) that Xcel Energy intended to use the Alternative Permitting Process for the Project. This letter complies with the requirement of Minnesota Rules 7850.2800, Subp. 2, to notify the Commission of this election at least 10 days prior to submitting an application for a Route Permit. A copy of the letter is attached in Appendix A.1.

3.0 PROJECT INFORMATION

3.1 PROJECT LOCATION

The Project is located in McLeod and Carver Counties, near the cities of Glencoe, Plato, Norwood Young America, and Cologne. Appendix B includes detailed maps of the townships crossed by the proposed route and Project Area. Table 2 identifies the counties, cities and townships ("Local Government Units" or "LGUs"), in addition to the Public Land Survey ("PLS") designation of areas occupied by the proposed route.

The western end of the Project Area is located in Helen Township, McLeod County, at the location of the City of Glencoe's proposed Diamond Substation. From there, the Project Area extends to the east into and across Norwood Young America, Waconia, Benton, and Dahlgren Townships in Carver County terminating on the west side of Aue Lake which is located 1.25 miles west of the Augusta Substation. Table 2 below summarizes the proposed Project location. Appendix B contains a General Vicinity Map – Segment 1-7 that identifies the Project Area.

TABLE 2
PROJECT LOCATION

County / Township / City	PLS Township (N)	PLS Range (W)	PLS Sections
McLeod / Helen	115	27	1, 2, 8-11, 15-17
Carver / Young America	115	26	1, 2, 4-6, 9-11
Carver / City of Norwood Young America	NA	NA	NA
Carver / Waconia	116	25	31-33
Carver / Benton	115	25	1-12
Carver / Dahlgren	115	24	4-9

3.2 PROJECT PROPOSAL

The proposed Project measures approximately 23 miles in length and primarily follows existing transmission line corridors. Xcel Energy proposes to:

- Segment 1: Rebuild approximately 3.6 miles of existing 69 kV transmission line (Line #0771) to a 115/69 kV double circuit transmission line between the city of Glencoe's new Diamond Substation and the Plato Substation located north of the town of

Plato, just west of the intersection of 122nd Street and County Highway 9. This route will begin at the Diamond Substation and proceed 2.1 miles along the south side of 110th Street, crossing Dairy Avenue at the 0.05 mile mark. It proceeds northeast along the west side of Boone Avenue, crossing to the east side at an unnamed tributary to Buffalo Creek. As Boone Avenue turns north, the line continues northeast across agricultural land to the Plato Substation, which will be slightly relocated 250 to 500 feet southwest of the existing substation.

- Segment 2: Rebuild approximately 6.4 miles of existing 69 kV transmission line (Line #0771) to a 115 kV transmission line between the Plato Substation to the intersection of State Highway 25/5 and County Highway 34. This route proceeds east from the substation along the north side of McLeod County Road 3 (122nd Street), which becomes Carver County Road 34. The route crosses to the south side of County Road 3 at Zebra Avenue and continues east on the south side of the county road. At Urban Avenue, the route deviates south from County Road 34 right of way, crossing agricultural land and a farmstead. The route crosses to the north side of County Road 34 approximately 500 feet east of County Road 33 and continues to Highway 25/5.

- Segment 3: Construct approximately 0.9 miles of new 115 kV transmission line along State Highway 25/5 between the intersection of State Highway 25/5 and County Highway 34 and the intersection of State Highway 25/5 and 5th Avenue NE, located on the northeast side of Norwood Young America. This route will be aligned along the north side of the roadway for all but the easternnmost 500 feet, which crosses to the south side of Highway 25/5.

- Segment 3a: The existing 69 kV line (Line #0735) extending from the intersection of Highway 25/5 and County Road 34 to the Young America Substation will be deconstructed. This route is located approximately one-half block north of and parallels First Street Northwest.

- Segment 3b: The existing 69 kV line extending along Fifth Avenue northward from 118th Avenue to the southeast quadrant of the intersection of Highway 25/5 will be deconstructed. This 0.3 mile line crosses from the west side of Fifth Avenue to the east side immediately north of 118th Avenue.

- Segment 4: Rebuild approximately 3.2 miles of existing 69 kV transmission line (Line #0735) to a 115 kV transmission line between the intersection of State Highway 25/5

and 5th Avenue and intersection of State Highway 5 and County Road 51. This route extends from the southeast quadrant of Highway 25/5 and 5th Avenue northeastward on the south side of the highway.

- Segment 4.5: Construct approximately 150 feet of new 115 kV transmission line from Segments 4 into, and out of the existing West Waconia Substation. This route will be on the south side of Highway 5.

- Segment 5: Rebuild approximately 1.0 mile of existing 69 kV transmission line (Line #0735) to a 115 kV transmission line between the West Waconia Substation and the intersection of Highway 5 and County Road 51. This route extends from the substation northeastward on the south side of the Highway 5.

- Alternate Segment 5a: Construct 0.7 miles of new double circuit 69/115 kV from Waconia West Substation along 106th Street to County Road 51. This route would deviate from Highway 5 and proceed east on the southern side of 106th Street.

- Segment 6: Construct approximately 1.9 miles of new 115/69 kV double circuit transmission line along County Highway 51 between Highway 5 and the existing Xcel Energy 69 kV (Line #0740). The route of this segment could include either the east or west side of County Highway 51. This segment will be initially operated at 69 kV.

- Segment 7: Rebuild approximately 7 miles of existing 69 kV transmission line (Line #0740) to a 115 kV transmission line between intersection of County Highway 51 and line #0740 and Structure #142 on the west side of Aue Lake. The route proceeds east from County Highway 51 through agricultural land and around the south end of Winkler Lake. East of Winkler Lake, the route continues along the south side of County Road 153. The route continues easterly as County Road 153 turns north, proceeding past the north edge of Miller Lake to the eastern termination of the Project. This segment will be initially operated at 69 kV.

The proposed Diamond Substation is being designed and constructed by the City of Glencoe. The proposed substation is not included in this Route Permit Application. The City of Glencoe will obtain the necessary permit(s) for that facility.

3.3 NEED FOR PROJECT

Xcel Energy initiated the CON application process with the Commission on December 2, 2009 by filing a Notice Plan Petition in Docket No. 09-1390. Xcel Energy filed the CON

application on November 30, 2010. A summary of the need for the Project is presented below.

The need for the Project was first identified in the *Glencoe Area Transmission Study*, conducted in 2002. That study identified the need for a 115 kV transmission line in the McLeod – Glencoe – West Waconia area. The first phase, the McLeod – Glencoe segment was placed in-service in 2006. This Application addresses the need to complete the second Phase of the plan, which is the Glencoe – West Waconia segment. The Glencoe – West Waconia segment will maintain reliable service to the City of Glencoe during loss of the McLeod – Glencoe line. Without the Glencoe – West Waconia line, under certain conditions customer equipment such as process controls, motor drive controls and automated machines, could be damaged due to low voltages. Depending on the duration of a low voltage condition, equipment such as electronic power supplies could also malfunction or fail when output voltage drops below certain levels. Without the proposed transmission upgrades, low voltage conditions will worsen as the area experiences continued growth and development.

The *Southwest Twin Cities Load Serving Study Review* (the "Study"), which was developed in September 2009 with updated analysis specific to the Glencoe – Waconia area, identified additional need for transmission in the study area. At times when other transmission lines were out of service, several overloading and low voltage conditions were identified. The Study focused on two regions including, Scott County – Carver County and Carver County – Glencoe. In the Scott County – Carver County region, if either the Scott County Substation 1 or 2 transformers is out of service, the remaining transformer will overload. With an outage of the Scott County – Chaska 69 kV transmission line (Line #0740), low voltage conditions arise at the city of Chaska and high flow conditions occur on the Carver County – Augusta transmission line (Line #0740). In the Carver County Substation – Glencoe Substation area, potential low voltage conditions may occur in the future during the outage of St. Bonifacius – Dickinson 115 kV transmission line (owned by Great River Energy) and numerous low voltage conditions occur when the City of Glencoe is served from the 69 kV system during the loss of the Glencoe – McLeod 115 kV line (owned by Great River Energy).

The Study also indicates that the voltages at the West Waconia Substation and St. Bonifacius Substation will drop if the Dickinson source is lost without the running of the St. Bonifacius Substation generation. The 69 kV lines between Glencoe and Carver County have also been a source of poor reliability due to their age.

The Project eliminates the low voltages at the Glencoe Substation by providing a second source to the city from West Waconia. The Project also eliminates future low voltage

conditions at the St. Bonifacius Substation and the West Waconia Substation by providing a new source into the region from McLeod. The Project also replaces the existing old 69 kV lines, thereby eliminating some of the sources of poor reliability.

The upgrade of the 69 kV line between the West Waconia Substation and Scott County Substation to 115 kV helps mitigate the low voltage conditions in the area by reducing the impedance of the line. Additionally, by serving the City of Chaska from Carver County, overloading on the Scott County transformer is reduced.

3.4 PROJECT SCHEDULE

Xcel Energy anticipates a winter 2012 in-service date for the Project. Construction is expected to start in 2011. This schedule is based on information available at the date of this filing and planning assumptions that balance the timing of implementation with the availability of crews, materials and other practical considerations. This schedule may be revised as further information is developed.

Several segments of the proposed transmission line will be built to 115 kV standards, but operated at 69 kV until other transmission system upgrades are made in the Chaska area. We anticipate construction of these upgrades within the next 3 to 4 years. These segments include Segment 6, the new 115/69 kV double circuit transmission line along County Highway 51 between Highway 5 and the existing Xcel Energy 69 kV line #0740. This line will initially be operated at 69 kV. However, the structures will be capable of accommodating a second 115 kV circuit. Also included is Segment 7, the existing 69 kV transmission line which will be rebuilt to a 115 kV transmission line between the intersection of County Highway 51 and line #0740 and the west side of Aue Lake. This line will initially be operated at 69 kV.

The existing 69 kV transmission line exiting the West Waconia Substation to the east will be rebuilt to a 115 kV transmission line, but on a slightly delayed schedule. This segment will be constructed prior to transmission system upgrades made to the transmission system in the Chaska area. Details of this future project are presented in Section 4.5.

3.5 PROJECT COSTS

Xcel Energy estimates that the transmission line and substation modifications will cost approximately $25.6 million. Xcel Energy provides this estimate with a plus or minus 30 % accuracy. Therefore, the total Project cost could be between $18 and $33 million.

Transmission Line Facilities	$22,200,000
Substation Facilities	$3,400,000
Total Project Cost:	$25,600,000

Operating and maintenance costs for the Project will be nominal for several years, since the line will be new and there is minimal vegetation management required. Typical annual operating and maintenance costs for 115 kV transmission lines across Xcel Energy's Upper Midwest system area are on the order of $300 to $500 per mile of transmission right-of-way. The principal operating and maintenance cost will include inspections, which are usually done by fixed-wing aircraft and by helicopter on a regular basis.

The Company performs periodic inspections of substations and equipment. The type and frequency of inspection varies depending on the type of equipment. Typical inspection intervals are semi-annual or annual. Maintenance and repair are performed on an as-needed basis, and therefore the cost varies from substation to substation.

4.0 FACILITY DESCRIPTION AND ROUTE SELECTION RATIONALE

4.1 TRANSMISSION LINE DESCRIPTION

The Project involves rebuilding the majority of the existing single circuit 69 kV lines (Line #0771 and #0740) between the proposed Diamond Substation and a structure (#142) just west of Aue Lake to a single circuit 115 kV transmission line and double circuit 115/69 kV transmission line. As a result, the proposed route for the transmission line primarily follows existing transmission rights-of-way for all but approximately 2.8 miles of the Project's length. A detailed description of the proposed route is provided in Table 3. Figure 2 provides an overview of the proposed route and Appendix B provides more detail on the proposed route.

The proposed route begins in McLeod County at the proposed Diamond Substation located on the eastern edge of the City of Glencoe. From this point, the route extends to the east and northeast approximately 3.6 miles to the Plato Substation, located at the intersection of 122nd Street and County Highway 9. From that intersection, the proposed route extends primarily eastward, crossing into Carver County and following along County Highway 34 from the county border towards the Young America Substation, located within the City of Norwood Young America.

Within the City of Norwood Young America, the proposed route includes the construction of a segment of new 115 kV transmission line that will parallel State Highway 25/5 from a point where State Highway 25/5 intersects with County Highway 34 extending approximately 1 mile to the northeast to a point near the intersection of State Highway 25/5 and 5th Avenue. It is expected that additional easements will be needed for this new 115 kV line. Due to the construction of the new 115 kV transmission line, approximately 0.8 miles of existing 69 kV transmission line within the City of Norwood Young America will be retired. This route is compatible with land use planning within the City of Norwood Young America, which anticipates the annexation of lands northwest of Highway 5 in the near future. A series of maps published by the City of Norwood Young America depicting city zoning, features and land use is attached as Appendix F.

The proposed route then follows State Highway 25/5, taps into and out of the West Waconia Substation, and continues along State Highway 5 to an intersection with County Highway 51. From this point, the route travels south to the intersection of Xcel Energy Transmission Line #0740. The route continues approximately 7.0 miles towards the east from the intersection

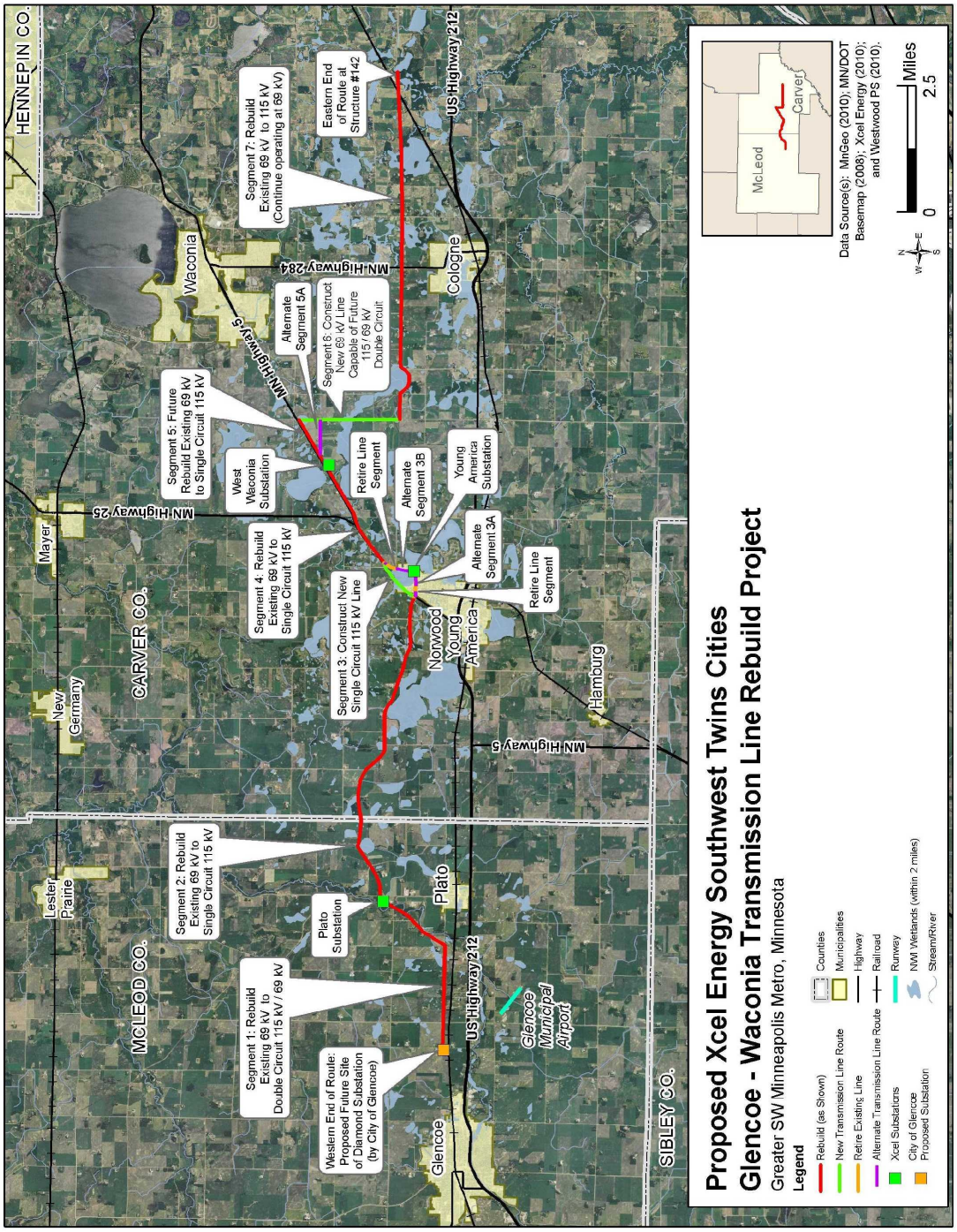
of Xcel Energy Transmission Line #0740 to the route termination point located at Structure #142, which is located on the west side of Aue Lake, just west of the existing Augusta Substation. Xcel Energy proposes to replace all existing structures during the rebuild of the existing 69 kV lines to double circuit 115/69 kV and single circuit 115 kV transmission lines, as described in Section 5.1.1, Structures, Right-of-Way, Construction and Maintenance.

TABLE 3
DETAILED ROUTE DESCRIPTION

Route Segment	Distance	Road and Public Waters Crossing
SEGMENT 1: Rebuild 69 kV to Double Circuit 115 kV / 69 kV – Diamond Substation to Existing NSP 69 kV line immediately east of Plato Substation		
EAST along 110th Street	2.1 miles	Dairy Avenue at 0.05 mile.
NORTH EAST along Boone Avenue and continuing across agricultural land to the Relocated Plato Substation	1.5 miles	Cross 110th Street at 0.01 mile; Cross Boone Avenue at 0.3 mile; Split with Boone Avenue at 0.8 mile; Cross Buffalo Creek at 1 and 1.05 mile; Cross 120th Street at 1.25 mile; Cross Buffalo Creek at 1.3 mile.
SEGMENT 2: Rebuild to Single Circuit 115 kV – Plato Substation to State Highway 25/5		
EAST along County Highway 3 (McLeod County) changing to County Road 34 (Carver County)	6.4 miles	Cross County Highway 9 at 0.05 mile; Cross 122nd Street at 1.2 mile; Cross Zebra Avenue at 1.7 mile; Cross County Road 131 at 3.3 mile; Cross unnamed tributary of South Fork Crow River at 4.0 mile; Cross Utopia Avenue at 5.3 mile; Cross County Highway 33 at 5.9 mile; Cross County Highway 34 at 6.1 mile
SEGMENT 3: New Construction of 115 kV – Intersection of County Road 34 and State Highway 5/25 to Intersection of 118th Avenue and State Highway 25/5		
NORTH EAST along State Highway 25	0.9 miles	Cross unnamed drainage ditch at 0.4 mile; Cross 5th Avenue NE at 0.8 mile; Cross State Highway 25 at 0.8 mile
ALTERNATE SEGMENT 3a: Deconstruct Existing 69 kV - Intersection of State Highway 5/25 and County Highway 34 to Young America Substation		
EAST parallel to 1st Street NW	0.5 miles	Cross State Highway 25 at 0.01 mile; Cross Central Avenue N at .2 mile; Cross 4th Ave

Route Segment	Distance	Road and Public Waters Crossing
		NE at .5 mile
ALTERNATE SEGMENT 3b: Deconstruct Existing 69 kV – The SE Quadrant of Intersection of State Highway 25/5 and 5th Avenue		
NORTH	0.3 miles	Cross 118th Street at 0.15 mile
SEGMENT 4: Rebuild Single Circuit to 115 kV - SE Quadrant of Intersection of State Highway 25/5 and 118th Avenue to West Waconia Substation		
NORTH EAST	3.2 miles	Cross Salem Ave at 1.1 mile; Cross County Ditch #10 at 1.3 mile; Cross unnamed stream at 1.9 mile
SEGMENT 4.5: Construct new 115 kV transmission line from Segments 4 and 5 into and out of West Waconia Substation.		
SOUTHEAST	150 feet	No features crossed
SEGMENT 5: Rebuild to Single Circuit 115 kV - West Waconia Substation to Co. Highway 51		
NORTH EAST	1 miles	Cross 106th Street at 0.2 mile
ALTERNATE SEGMENT 5a: Construct New Double Circuit 69 kV/115 kV along length of 106th Street Between State Highway 5 and County Highway 51.		
EAST	0.7 miles	No features crossed
SEGMENT 6: Construct New Double Circuit 69 kV /115 kV - Intersection of State Highway 5 and County Highway 51 to Existing Xcel Energy Line #0740		
SOUTH	1.9 miles	Cross 106th Street at 0.4 mile; Cross unnamed stream at 1 mile; Cross 114th Street at 1.4 mile
SEGMENT 7: Rebuild to Single Circuit 115 kV – Existing Xcel Energy Line #0740 at County Highway 51 to Structure #142 located West of Aue Lake		
EAST	7 miles	Cross Post Avenue at 0.5 mile; Cross County Road 153 at 1.2 mile; Cross State Highway 284 at 3.1 mile; Cross unnamed stream at 3.9 mile; Cross Market Avenue at 4.1 mile; Cross Laurel Avenue at 4.7 mile; Cross County Ditch 2-3 (Carver Creek) at 5.1 mile; Cross Kelly Avenue at 6.2 mile; Cross Twin Cities and Western Railroad at 6.6 mile

FIGURE 2
PROPOSED ROUTE



4.2 ROUTE WIDTH AND ALIGNMENT SELECTION PROCESS

The proposed route for the Project was developed by the Company's permitting and engineering personnel based on their investigation of the overall Project Area and input from government entities and the public. The Company also performed an analysis of environmental resources in the Project Area by using computer mapping aerial photographs and topographic maps. Environmental resources identified within the Project Area are discussed in Sections 6.5 and 6.6 of this Application. A list of wildlife species that is representative of the Project Area is contained in Appendix C. The proposed route is designed to best minimize the overall impacts of the Project.

On November 12, 2009, Xcel Energy provided Project information and requested comments from Local Government Units ("LGUs") located within the Project Area. See Section 7.1 and Appendix D of this Application for additional information.

A public open house meeting was held by Xcel Energy at the Roy Clark Community Building in Norwood Young America, Minnesota on February 8, 2010. Xcel Energy published notice of the open house meeting on February 3, 2010. See Appendix E.2. Approximately twenty-seven people attended this open house meeting. See Appendix E.3. The attendees focused primarily on the location of the new segment of transmission line near the West Waconia Substation and transmission structure design details of the proposed Project.

The proposed transmission line locations were developed with the following primary objectives:

- Maximize use of existing transmission line alignments and rights-of-way;
- Minimize impacts to residences;
- Minimize use of new right-of-way; and
- Minimize impacts to environmental and sensitive resources.

The Company believes the proposed rebuild and new transmission line routes for the Project best meets the objectives stated above.

In particular, the proposed Project maximizes the use of existing transmission line corridors – the proposed route uses existing transmission rights-of-way for all but approximately 2.8 miles of its length. The use of existing transmission line corridors was an important factor for this Project because using existing corridors reduces transmission line proliferation and impacts to residences. The proposed route also minimizes impacts to environmental and sensitive resources.

Xcel Energy requests a route width of 100 feet on each side of the existing facilities route centerline (200 feet total width) for a majority of the route, except for the new route segments proposed along County Highway 5/25 and County Highway 51 where Xcel Energy requests a route width of 200 feet on each side of the road centerline (400 feet total width).

4.3 Alternative Segments Considered and Rejected

In evaluating the route for the proposed Project, Xcel Energy focused predominantly on the alignment of existing transmission lines because it best satisfied the relevant routing criteria.

Xcel Energy evaluated the following alternatives for segments of the proposed route requiring new right-of-way ("ROW") corridors. Appendix B, General Vicinity Maps Segment 3 and 5 identify the locations of these alternative route segments.

Alternate Segment 3a and 3b: Maintenance of Transmission Line Through Residential Lots Within the City of Norwood Young America.

Xcel Energy evaluated an alternate route within line Segment 3. The route would utilize existing line routes located in the northern portion of the city of Norwood Young America. Alternate Segment 3a consists of the existing 69 kV transmission line extending from the intersection of Carver County Highway 34 and CSAH 5 and extending east approximately 0.5 miles to the existing Young America Substation. Alternate Segment 3b then extends approximately 0.6 mile to the north along the existing transmission route between the Young America Substation and CSAH 5. Alternate Segment 3a was rejected due to the fact that 46 residences and 1 commercial business are located within 200 feet of the line, compared to 6 urban residences, 1 commercial business, and 1 rural residence within 200 feet of the new proposed Segment 3 line along CSAH 5, north and west of Braunworth Lake. Additionally, 4 residences are located within 200 feet of Alternate Segment 3b, which would be utilized if Alternate Segment 3a was selected (*see* Appendix B). The existing distribution underbuild along Alternate Segment 3a would stay in-place if the proposed Segment 3 is approved. If Alternate Segments 3a and 3b are selected, a portion of Alternate Segment 3b would need to be constructed as a double circuit 115/69 kV transmission line. This double circuit portion would extend from the Norwood Young America Substation to a switch located approximately 0.3 miles north of the Norwood Young American Substation. Under this scenario, the existing distribution underbuild would also stay in place.

Alternate Segment 5a: Construction of New 115/69 kV Double Circuit Transmission Line Along 106th Street, Carver County.

Xcel Energy evaluated Alternate Segment 5a, which is located east of CSAH 5 and north of Rice Lake in Waconia Township. Alternate Segment 5a consists of an approximately 0.7 mile

segment of new 69/115 kV double circuit transmission line paralleling 106th Street between State Highway 5 to the west and Carver County Highway 51 to the east. Alternate Segment 5a was rejected due to its proximity to one commercial business, and two farmsteads within 200 feet of the line. In comparison, the proposed route for Segment 5 is not within 200 feet of any residences or commercial businesses. In addition, the engineering issues involved in construction of a double circuit to maintain local distribution lines would not be practical within the existing ROW. These issues create a much less practical option compared to the use of the preferred route (see Appendix B: Environmental Features Map – Segment 5). Alternate Segment 5a is, however, 0.5 mile shorter in length than the proposed Segment 5.

4.4 West Waconia and Plato Substation Modifications

The existing West Waconia and Plato Substations will be modified as part of the Project. Equipment additions at the existing West Waconia Substation will include one 115 kV circuit breaker and associated electrical equipment, such as switches, to accommodate the new 115 kV line. The proposed transmission line will tap into and out of the West Waconia Substation and require a 75 foot right-of-way.

The existing Plato substation will be re-built and expanded to accommodate the Project needs. The new Plato facility will be approximately 440 feet by 255 feet in size, and re-located approximately 250 to 500 feet southwest from the existing substation. (See Appendix B: Modifications to Plato Substation). The existing 69-12.5 kV distribution substation, along with all equipment, structures and foundations, will be removed and relocated based on landowner preference. The new substation will consist of a graded, fenced area with steel box structures and electrical equipment, including a transformer, circuit breakers, switches and a capacitor bank.

4.5 Design Options to Accommodate Future Transmission Lines

West Waconia and Plato Substations

The West Waconia Substation will be designed to accommodate an interconnection for a future rebuild of the existing 230 kV transmission line located north of the substation. Plato Substation is designed to accommodate future 69 kV or 115 kV lines and transmission transformation.

New 115/69 kV Double Circuit and Existing 69 kV Transmission Line

Several segments of the proposed transmission line will be built to 115 kV standards, but operated at 69 kV until transmission system upgrades are made to the transmission system in the Chaska area. These segments include Segment 6, the new 115/69 kV double circuit transmission line along County Highway 51 between Highway 5 and the existing Xcel Energy

69 kV line #0740. This line will initially be operated at 69 kV. However, the structures will be capable of accommodating a second 115 kV circuit. Also included is Segment 7, the existing 69 kV transmission line which will be rebuilt to a 115 kV transmission line between the intersection of County Highway 51 and line 0740 and Structure #142 on the west side of Aue Lake. This line will initially be operated at 69 kV.

The existing 69 kV transmission line exiting the West Waconia Substation to the east will be rebuilt to a 115 kV transmission line, Segment 5, but on a slightly delayed schedule. Segment 5 will be constructed prior to transmission system upgrades made to the transmission system in the Chaska area. The Chaska area project is anticipated to service growing load requirements in that region. Anticipated growth in industrial energy use will require the upgrade of existing 69 kV lines to 115 kV, a new substation in the Chaska area, and some new alignment to connect the substation to the existing lines in the area.

5.0 ENGINEERING DESIGN, CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION

5.1 STRUCTURES, RIGHT-OF-WAY, CONSTRUCTION AND MAINTENANCE

5.1.1 Transmission Structures

Steel poles with horizontal braced post insulators are proposed to be used for the 115 kV single circuit transmission lines. Steel poles with davit arms are proposed for the 69/115 kV double circuit transmission line. Pictures of the proposed structure types are shown below in Figures 3 and 4. Direct embedded weathering steel poles with davit arms are proposed to be used for the tangent structures if soil conditions warrant. Rock-filled culvert foundations may be required in areas with poor soils. Self-supporting weathering steel poles with davit arms on drilled pier concrete foundations are proposed to be used for all long span, angle and dead-end structures.

FIGURE 3
PHOTO OF TYPICAL 115 KV
SINGLE CIRCUIT BRACED POST STRUCTURE

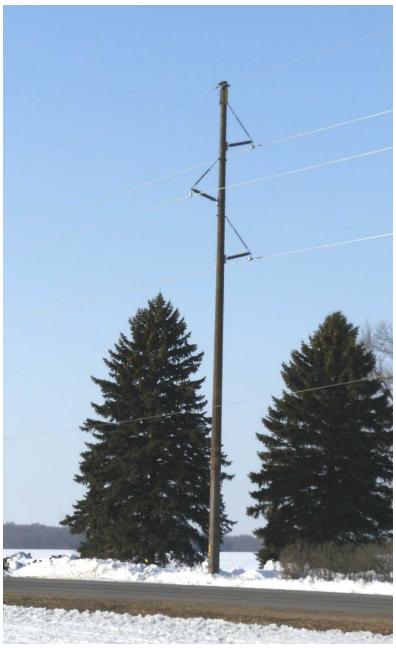
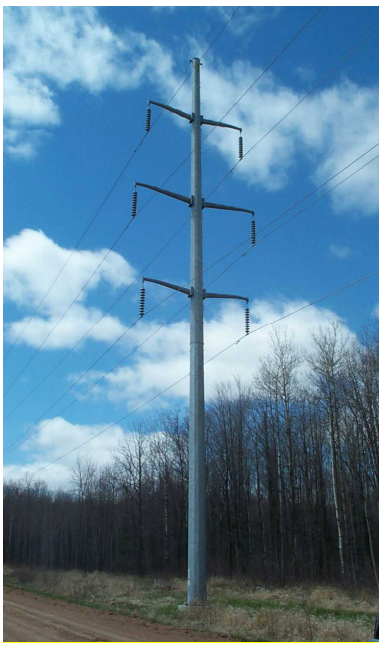


FIGURE 4
PHOTO OF TYPICAL 115/69 KV
DOUBLE CIRCUIT DAVIT ARM STRUCTURE



The steel structures will be approximately 60 to 105 feet tall with spans of approximately 300 to 400 feet to keep the conductor within existing right-of-ways where applicable. Table 4 summarizes the structure design for the line.

The proposed transmission line will be designed to meet or surpass relevant local and state codes including the National Electric Safety Code ("NESC"), North American Electric Reliability Corporation ("NERC") and Company standards. Appropriate standards will be met for construction and installation, and applicable safety procedures will be followed during and after installation.

The 115 kV conductor proposed for the Project will be 795 kcmil 26/7 Aluminum Core Steel Supported ("ACSS"). The 69 kV conductor proposed for the Project will be 477 kcmil 26/7 Aluminum Conductor Steel Reinforced ("ACSR").

TABLE 4
STRUCTURE DESIGN SUMMARY

Line Type	Structure Type	Structure Material	Right-of-Way Width (feet)	Structure Height (feet)	Foundation	Foundation Diameter (feet)	Span Between Structures (feet)
115 kV Single Circuit	Single pole, horizontal braced post insulator	Weathering steel	75	60-80	Direct embedded for tangents and self-supporting for angle/ dead-end structures	Direct embedded or 4 foot diameter culvert or 5 to 6 foot concrete	300 to 400
115/69 kV Double Circuit	Single pole, davit arm	Weathering steel	75	75-105	Direct embedded for tangents and self-supporting for angle/ dead-end and switch structures	Direct embedded or 4 foot diameter culvert or 6 to 8 foot concrete	300 to 400

5.1.2 Right-of-Way Width

Xcel Energy typically requires a right-of-way width up to 75 feet wide for the construction of new transmission lines proposed in this Project. However, Xcel Energy will work within the existing 50 foot wide right-of-way for the rebuild portions of the Project whenever reasonably possible. When necessary, blanket easements may be modified up to a 75-foot width along the re-build portions of the Project.

Approximately 1.9 miles of new right-of-way will need to be acquired along County Highway 51 to construct Segment 6. Segment 6 involves construction of a new 69 kV transmission line which will be constructed to be 115/69 kV double circuit capable. The route of this segment between Highway 5 and the existing Xcel Energy 69 kV line 0740 could be aligned along either the east or west side of County Highway 51.

Approximately 0.9 mile of new right-of-way will also need to be acquired along Highway 25/5 to allow the new 115 kV line to bypass the Young America Substation (Segment 3). This route will follow the northwest side of Highway 25/5. The Project segments requiring new right-of-way acquisition are indicated in Appendices B.1.c and B.1.d.

For new right-of-way, Xcel Energy will require a 75-foot wide right-of-way for the transmission line. When the line is parallel to a roadway, poles will generally be placed 5 feet within the private right-of-way adjacent to the roadway. Therefore, a little less than half of the line right-of-way will share the existing road right-of-way, resulting in an easement of lesser width being required from the landowner. In general, the structures will be placed as close to the property line as practical.

For the proposed Project, approximately 17.8 miles of the 23 miles (77%) will be parallel to existing roadways, and approximately 5.23 miles (23%) will be cross country transmission lines. Figures 5 and 6 show the pole dimensions and general right-of-way requirements for the line.

FIGURE 5
TYPICAL DIMENSIONS AND RIGHT-OF-WAY REQUIREMENTS
FOR SINGLE CIRCUIT BRACED POST STRUCTURE

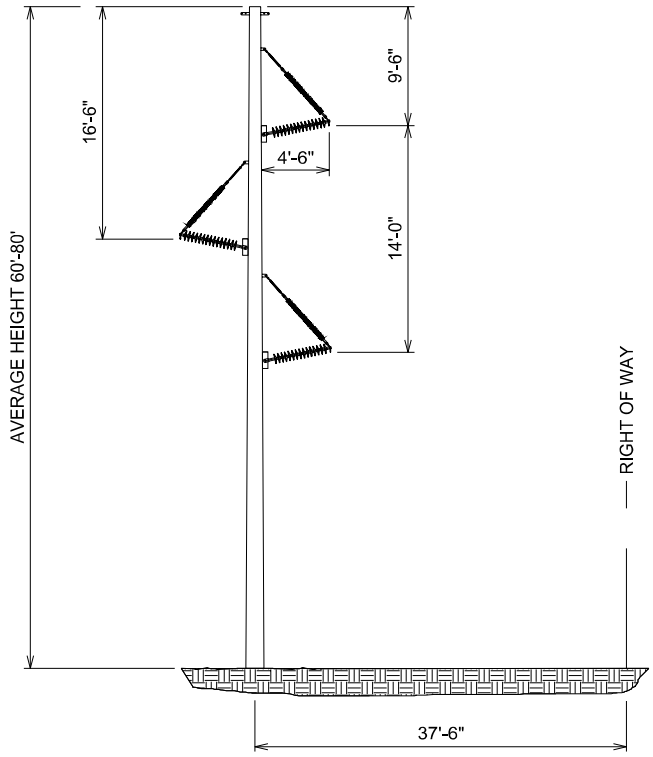
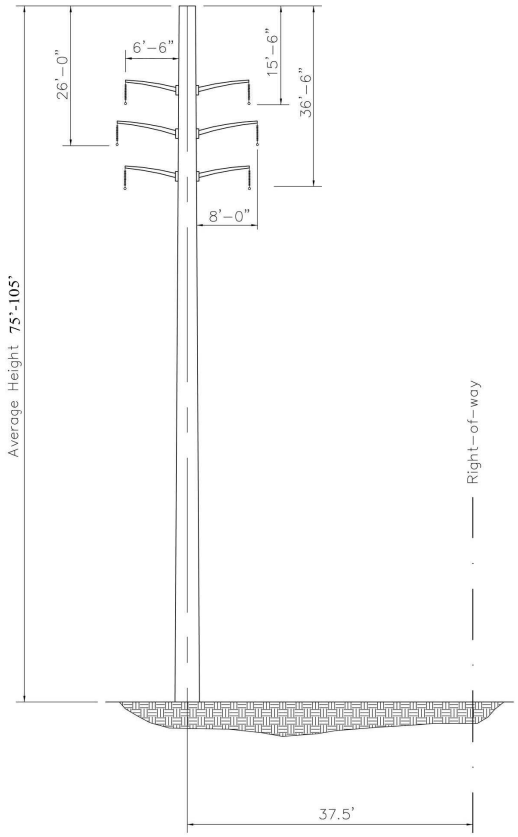


FIGURE 6
TYPICAL DIMENSIONS AND RIGHT-OF-WAY REQUIREMENTS
FOR DOUBLE CIRCUIT DAVIT ARM STRUCTURE



5.1.3 Right-of-Way Evaluation and Acquisition

Where the Project is expected to use existing rights-of-way, the right-of-way agent will evaluate all existing easements. If the terms of the existing easement are sufficient and no new right-of-way is needed, the right-of-way agent will continue to work with the landowner to address any construction needs, impacts, damages or restoration issues. To the extent new right-of-way acquisition is necessary the right-of-way agent will work with landowners to determine how to expand existing easements.

For those segments of the Project where new right-of-way will be necessary, the acquisition process begins early in the detailed design phase. For transmission lines, utilities acquire easement rights across certain parcels to accommodate the facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document

preparation and purchase. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

The first step in the right-of-way process is to identify all persons and entities that may have a legal interest in the real estate upon which the facilities will be built. To compile this list, a right-of-way agent or other persons engaged by the utility will complete a public records search of all land involved in the project. A title report is then developed for each parcel to determine the legal description of the property and the owner(s) of record of the property, and to gather information regarding easements, liens, restriction, encumbrances and other conditions of record.

After owners are identified, a right-of-way representative contacts each property owner or the property owner's representative. The right-of-way agent describes the need for the transmission facilities and how the Project may affect each parcel. The right-of-way agent also seeks information from the landowner about any specific construction concerns.

The next step in the acquisition process is evaluation of the specific parcel. For this work, the right-of-way agent may request permission from the owner for survey crews to enter the property to conduct preliminary survey work. Permission may also be requested to take soil borings to assess the soil conditions and determine appropriate foundation design. Surveys are conducted to locate the right-of-way corridors, natural features, man-made features and associated elevations for use during the detailed engineering of the line. The soil analysis is performed by an experienced geotechnical testing laboratory.

During the evaluation process, the location of the proposed transmission line or substation facility may be staked with permission of the property owner. This means that the survey crew locates each structure or pole on the ground and places a surveyor's stake to mark the structures or substation facility's anticipated location. By doing this, the right-of-way agent can show the landowner where the structure(s) will be located on the property. The right-of-way agent may also delineate the boundaries of the easement area required for safe operation of the line.

Prior to the acquisition of easements or fee purchase of property, land value data will be collected. Based on the impact of the easement or purchase to the market value of each parcel, a fair market value offer will be developed. The right-of-way agent then contacts the property owner(s) to present the offer for the easement and discuss the amount of just compensation for the rights to build, operate and maintain the transmission facilities within the easement area and reasonable access to the easement area. The agent will also provide

maps of the line route or site, and maps showing the landowner's parcel. The landowner is allowed a reasonable amount of time to consider the offer and to present any material that the owner believes is relevant to determining the property's value. This step is often performed prior to full evaluation in the form of an "option to purchase" contract and can be very helpful in obtaining permission for completion of all necessary evaluations.

In nearly all cases, utility companies are able to work with the landowners to address their concerns and an agreement is reached for the utility's purchase of land rights. The right-of-way agent prepares all of the documents required to complete each transaction. Some of the documents that may be required include: easement; purchase agreement; contract; and deed.

In rare instances, a negotiated settlement cannot be reached and the landowner chooses to have an independent third party determine the value of the rights taken. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minnesota Statutes, Chapter 117. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, the right-of-way agent must obtain at least one appraisal for the property proposed to be acquired and a copy of that appraisal must be provided to the property owner. Minn. Stat. § 117.036, subd. 2(a). The property owner may also obtain another property appraisal and the company must reimburse the property owner for the cost of the appraisal according to the limits set forth in Minnesota Statute § 117.036, Subd. 2(b). The property owner may be reimbursed for reasonable appraisal costs up to $1,500 for single-family and two-family residential properties, $1,500 for property with a value of $10,000 or less, and $5,000 for other types of properties.

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

As part of the right-of-way acquisition process, the right-of-way agent will discuss the construction schedule and construction requirements with the owner of each parcel. To ensure safe construction of the line, special consideration may be needed for fences, crops or livestock. For instance, fences may need to be moved, temporary or permanent gates may need to be installed; crops may need to be harvested early; and livestock may need to be moved. In each case the right-of-way agent and construction personnel coordinate these processes with the landowner.

5.1.4 Transmission Construction Procedures

Construction will begin after all federal, state and local approvals are obtained, property and rights-of-way are acquired, soil conditions are determined and the design is completed. The precise timing of construction will take into account various requirements that may be in place due to permit conditions, system loading issues, available workforce and materials.

The actual construction will follow standard construction and mitigation practices that have been developed from experience with past projects. These best practices address right-of-way clearance, 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. In certain cases some activities, such as schedules, are modified to minimize impacts to sensitive environments.

Typical construction equipment used on transmission projects includes 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. Wood or steel poles are transported on tractor-trailers.

Steel poles are proposed to be used for the structures for the Project. Steel pole tangent structures are proposed to be directly embedded into the ground if soil conditions warrant. Rock-filled culvert foundations may be required in areas with poor soils. This method typically involves digging a hole for each pole, filling it partially with crushed rock and then setting the pole on top of the rock base. The area around the pole is then backfilled with crushed rock and/or soil. Culvert foundations involve auguring a hole for each pole, installing a galvanized steel culvert, filling the annular space outside the culvert with hole

spoils, filling the culvert partially with crushed rock and then setting the pole on top of the rock base. The annular space between the pole and culvert is filled with crushed rock.

Long span, angle and dead end structures along the route will require concrete foundations. In those cases, holes will need to be drilled in preparation for the concrete foundations. Drilled pier foundations may vary from five to eight feet in diameter and 20 to 30 feet deep, depending on soil conditions. Steel reinforcing bars and anchor bolts are installed in the drilled holes prior to concrete placement. Concrete trucks are required to bring the concrete in from a local concrete batch plant. Steel pole structures are hauled unassembled on pole trailers to the staked location and placed within the right-of-way until the pole sections are assembled and the arms attached. Insulators and other hardware are attached while the steel pole is on the ground. The pole is then lifted, placed and secured on the foundation using a crane.

Construction staging areas are usually established for transmission projects. Staging involves delivering the equipment and materials necessary to construct the new transmission line facilities. Construction of the Project will likely include one or two staging areas. Structures are delivered to staging areas and materials are stored until they are needed for the project. The materials are stored until they are needed for the Project and then sorted and loaded onto structure trailers for delivery to the staked location.

In some cases, additional space (temporary lay down areas) may be required. These areas will be selected for their location, access, security and ability to efficiently and safely warehouse supplies. The areas are chosen to minimize excavation and grading. The temporary lay down areas outside of the transmission line right-of-way will be secured from affected landowners through rental agreements.

Typically, access to the transmission line right-of-way corridor is made directly from existing roads or trails that run parallel or perpendicular to the transmission line right-of-way. In some situations, private field roads or trails are used. Where easements exist, the Company notifies the property owner that it will access the easement area. Where necessary to accommodate the heavy equipment used in construction, including cranes, concrete trucks and foundation drilling equipment, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed where no current access is available or the existing access is inadequate to cross roadway ditches.

Environmentally sensitive areas and wetland areas may also require special construction techniques in some circumstances. During construction, the most effective way to minimize

impacts to wet areas will be to span wetlands, streams, and rivers. In addition, the Company will not allow construction equipment to 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 construction practices help prevent soil erosion and ensure that equipment fueling and lubricating will occur at a distance from waterways.

Wetlands present within the Project Area are dominated by Palustrine or grassland/meadow type wetlands with a lesser number of Lacustrine or open water wetlands. If impacts to wetlands occur, they will be minimized through construction practices. Construction crews will maintain sound water and soil conservation practices during construction and operation of the facilities to protect topsoil and adjacent water resources and to minimize soil erosion. Practices may include containing excavated material, protecting exposed soil and stabilizing restored soil. Crews will avoid major disturbance of individual wetlands and drainage systems during construction. This will be accomplished by strategically locating new access roads and spanning wetlands and drainage systems where possible.

When it is not feasible to span the wetland, construction crews will consider the following options during construction to minimize impacts:

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

5.1.5 Restoration Procedures

During construction, crews will attempt to limit ground disturbance wherever possible. However, areas are typically disturbed during the normal course of work, which can take several weeks in any one location. As construction on each parcel is completed, disturbed areas will be restored to their original condition to the maximum extent practicable. The right-of-way agent contacts each property owner after construction is completed to determine whether any damage has occurred as a result of the project.

If damage has occurred to crops, fences or the property, the Company will fairly reimburse the landowner for the damages sustained. In some cases, the Company may engage an

outside contractor to restore the damaged property to as near as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of transmission 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 corridor will require assistance in reestablishing vegetation and controlling soil erosion.

Commonly used methods to control soil erosion and assist in reestablishing vegetation include, but are not limited to:

- Erosion control blankets with embedded seeds;
- Silt fences;
- Hay bales;
- Hydro seeding; and
- Planting individual seeds or seedlings of native species.

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

5.1.6 Maintenance Procedures

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

The estimated service life of the proposed transmission line for accounting purposes is approximately 40 years. However, practically speaking, high voltage transmission lines are seldom completely retired. Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail.

Transmission lines are automatically taken out of service by the operation of protective relaying equipment when a fault is sensed on the system. Such interruptions are usually only momentary. Scheduled maintenance outages are also infrequent. As a result, the average annual availability of transmission infrastructure is very high, in excess of 99 percent.

The principal operating and maintenance cost for transmission facilities is the cost of inspections, which is usually done monthly by air. Annual operating and maintenance costs

for transmission lines in Minnesota and surrounding states vary. However, past experience shows that costs are approximately $300 to $500 per mile for voltages from 69 kV through 345 kV. Actual line-specific maintenance costs depend on the setting, the amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

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

5.2 Electric and Magnetic Fields

The term electromagnetic fields ("EMF") refer to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For the lower frequencies associated with power lines, (referred to as "extremely low frequencies" ("ELF")), EMF should be separated into electric fields ("EFs") and magnetic fields, ("MFs"), measured in kilovolts per meter ("kV/m") and milliGauss ("mG"), respectively. These fields are dependent on the voltage of a transmission line (EFs) and current carried by a transmission line (MFs). The intensity of the electric field is proportional to the voltage of the line, and the intensity of the magnetic field is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (cycles per second).

5.2.1 Electric Fields

There is no federal standard for transmission line electric fields. The Commission, however, has imposed a maximum electric field limit of 8 kV/m measured at one meter above the ground. *In the Matter of the Route Permit Application for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota,* Docket No. ET-2/TL-08-1474, Order Granting Route Permit (*adopting* ALJ Findings of Fact, Conclusions and Recommendation at Finding 194 (April 22, 2010 and amended April 30, 2010)) (September 14, 2010). The standard was designed to prevent serious hazards from shocks when touching large objects parked under AC transmission lines of 500 kV or greater. The maximum electric field, measured at one meter above ground, associated with the Project is calculated to be 1.19 kV/m (115 kV single circuit).

The calculated electric fields for the Project are provided in Table 5.

TABLE 5
CALCULATED ELECTRIC FIELDS (KV/M) FOR PROPOSED 115 KV
TRANSMISSION LINE DESIGNS (ONE METER ABOVE GROUND)

Structure Type	Maximum Operating Voltage (kV)	Distance to Proposed Centerline										
		-300'	-200'	-100'	-50'	-25	0'	25	50'	100'	200'	300'
Segment 1-4 Braced Post 115kV Steel Pole Single Circuit	121	0.006	0.015	0.057	0.185	0.630	1.193	0.493	0.207	0.052	0.013	0.006
Segment 1-4 Braced Post 115kV Steel Pole Single Circuit With 12.5kV Distribution Underbuild	121/13	0.007	0.016	0.054	0.122	0.199	0.179	0.196	0.146	0.053	0.014	0.007
Segment 7 Braced Post 115kV Steel Pole Single Circuit (Operating at 69kV)	72.5	0.004	0.009	0.034	0.111	0.377	0.715	0.295	0.124	0.031	0.008	0.003
Segment 7 Braced Post 115kV Steel Pole Single Circuit (Operating at 69kV) With 13.8kV Distribution Underbuild	72.5/15	0.004	0.010	0.033	0.072	0.117	0.129	0.123	0.087	0.032	0.009	0.004

Structure Type	Maximum Operating Voltage (kV)	Distance to Proposed Centerline										
		-300'	-200'	-100'	-50'	-25	0'	25	50'	100'	200'	300'
Segment 7 Braced Post 115kV Steel Pole Single Circuit With 13.8kV Distribution Underbuild	121/15	0.007	0.016	0.054	0.121	0.197	0.180	0.195	0.145	0.053	0.014	0.007
Segment 1-4 Davit Arm 115kV/69kV Steel Pole Double Circuit With 12.5kV Distribution Underbuild	121/72.5/13	0.006	0.011	0.016	0.046	0.148	0.227	0.241	0.060	0.041	0.017	0.008
Segment 1-4 Davit Arm 115kV/69kV Steel Pole Double Circuit	121/72.5	0.005	0.010	0.021	0.051	0.407	1.092	0.711	0.076	0.050	0.016	0.007
Segment 5-6 Davit Arm 115kV/69kV Steel Pole Double Circuit (Active 69kV Ckt) With 34.5kV/34.5kV Distribution Underbuild	72.5/36.2/36.2	0.006	0.012	0.017	0.092	0.292	0.141	0.346	0.140	0.040	0.013	0.006
Segment 5-7 Davit Arm 115kV/69kV Steel Pole Double Circuit With 34.5kV/34.5kV Distribution Underbuild	121/72.5/36.2/36.2	0.005	0.009	0.006	0.079	0.174	0.54	0.144	0.073	0.040	0.017	0.008

5.2.2 Magnetic Fields

There are presently no Minnesota regulations pertaining to MF exposure. Xcel Energy provides information to the public, interested customers and employees so they can make informed decisions about MFs. Such information includes the availability for measurements to be conducted for customers and employees upon request.

The magnetic field profiles around the proposed transmission lines for each structure and conductor configuration being considered for the Project is shown in Table 6. Magnetic fields were calculated for each section of the Project under three system conditions: the expected peak and average current flows as projected for the year 2015 under normal (system intact) conditions and peak current flow for the year 2025 under normal (system intact) conditions. The peak magnetic field values are calculated at a point directly under the transmission line and where the conductor is closest to the ground. The same method is used to calculate the magnetic field at the edge of the right-of-way. The magnetic field profile data show that magnetic field levels decrease rapidly as the distance from the centerline increases (proportional to the inverse square of the distance from source).

The magnetic field produced by the transmission line is dependent on the current flowing on its conductors. Therefore, the actual magnetic field when the Project is placed in service is typically less than shown in the charts. This is because the charts represent the magnetic field with current flow at expected normal peak based on projected regional load growth through 2025, the maximum load projection timeline available. Actual current flow on the line will vary, so magnetic fields will be less than peak levels during most hours of the year.

TABLE 6
CALCULATED MAGNETIC FLUX DENSITY (milligauss) FOR PROPOSED 115 KV TRANSMISSION LINE DESIGNS (ONE METER ABOVE GROUND)

Segment	System Condition	Current (Amps)	Distance to Proposed Centerline										
			-300'	-200'	-100'	-50'	-25	0'	25'	50'	100'	200'	300'
West Glencoe to East Glencoe 115kV Sgl Ckt	2015 Peak	171	0.19	0.37	1.47	5.21	12.67	21.84	11.74	5.39	1.86	0.60	0.32
	2015 Average	103	0.11	0.23	0.89	3.14	7.63	13.15	7.07	3.25	1.12	0.36	0.19
	2025 Peak	210	0.23	0.46	1.81	6.40	15.56	26.82	14.41	6.62	2.29	0.74	0.40
East Glencoe to West Waconia 115kV Sgl Ckt	2015 Peak	153	0.17	0.33	1.32	4.67	11.34	19.54	10.50	4.82	1.67	0.54	0.29
	2015 Average	92	0.10	0.20	0.79	2.81	6.82	11.75	6.31	2.90	1.00	0.32	0.17
	2025 Peak	194	0.21	0.42	1.67	5.92	14.38	24.77	13.31	6.12	2.11	0.68	0.37
East Glencoe to	2015 Peak	153/60	0.14	0.29	0.98	2.54	3.98	5.31	5.09	3.05	1.21	0.40	0.21

Segment	System Condition	Current (Amps)	Distance to Proposed Centerline										
			-300'	-200'	-100'	-50'	-25	0'	25'	50'	100'	200'	300'
West Waconia 115kV Sgl Ckt With 12.5kV Distribution Underbuild	2015 Average	92/36	0.09	0.17	0.59	1.53	2.40	3.19	3.06	1.84	0.73	0.24	0.13
	2025 Peak	194/60	0.18	0.36	1.26	3.33	5.32	6.90	6.43	3.88	1.55	0.51	0.27
West Waconia to Carver Co. Tap & Carver Co. Tap to Augusta 115kV Sgl Ckt	2015 Peak	107	0.12	0.23	0.92	3.26	7.93	13.66	7.344	3.3.7	1.16	0.38	0.20
	2015 Average	64	0.07	0.14	0.55	1.95	4.74	8.17	4.39	2.02	0.70	0.23	0.12
	2025 Peak	120	0.13	0.26	1.04	3.66	8.89	15.32	8.24	3.78	1.31	0.42	0.23
Carver Co. Tap to Augusta 115kV Sgl Ckt (Operated at 69kV)	2015 Peak	360	0.39	0.79	3.11	10.98	26.68	45.97	24.71	11.35	3.92	1.27	0.68
	2015 Average	216	0.23	0.47	1.86	6.59	16.01	27.58	14.82	6.81	2.35	0.76	0.41
	2025 Peak	360	0.39	0.79	3.11	10.98	26.68	45.97	24.71	11.35	3.92	1.27	0.68
East Glencoe to West Waconia East Glencoe to Plato 115kV/69kV Dbl Ckt With 12.5kV Distribution Underbuild	2015 Peak	153/109/150	0.29	0.58	1.78	4.34	7.51	10.34	6.64	3.80	1.47	0.42	0.19
	2015 Average	92/65/90	0.18	0.35	1.07	2.61	4.51	6.21	3.98	2.28	0.88	0.25	0.12
	2025 Peak	194/109/150	0.33	0.65	1.99	4.84	8.30	10.76	7.38	4.58	1.81	0.53	0.25
East Glencoe to West Waconia East Glencoe to Plato 115kV/69kV Dbl Ckt	2015 Peak	153/109	0.32	0.58	1.74	4.72	9.73	21.65	16.30	7.11	2.12	0.61	0.32
	2015 Average	92/65	0.19	0.35	1.04	2.82	5.82	12.99	9.80	4.27	1.27	0.37	0.19
	2025 Peak	194/109	0.39	0.70	2.03	5.30	10.74	26.06	20.42	9.00	2.69	0.77	0.41
West Waconia to Carver Co. Tap Waconia to Carver Co. Tap 115kV/69kV Dbl Ckt With 34.5kV/34.5kV Dbl Ckt Distr UB	2015 Peak	107/92/75/75	0.16	0.35	1.15	3.36	8.01	18.41	11.81	5.66	1.80	0.45	0.20
	2015 Average	64/55/45/45	0.10	0.21	0.69	2.01	4.81	11.04	7.08	3.39	1.08	0.27	0.12
	2025 Peak	107/92/75/75	0.16	0.35	1.15	3.36	8.01	18.41	11.81	5.66	1.80	0.45	0.20
Waconia to Carver Co. Tap	2015 Peak	92/75/75	0.18	0.40	1.46	4.38	9.36	16.67	8.20	3.58	1.23	0.36	0.17

Segment	System Condition	Current (Amps)	Distance to Proposed Centerline									
			-300'	-200'	-100'	-50'	-25	0'	25'	50'	100'	200'	300'
115kV/69kV Dbl Ckt (Active 69kV Circuit) With 34.5kV/34.5kV Dbl Ckt Distr UB	2015 Average	55/ 45/45	0.11	0.24	0.87	2.62	5.61	10.0	4.92	2.15	0.74	0.21	0.10
	2025 Peak	92/ 75/75	0.18	0.40	1.46	4.38	9.36	16.67	8.20	3.58	1.23	0.36	0.17
Carver Co. Tap to Augusta 115kV Sgl Ckt (Operated at 69kV) With 13.8kV Distribution Underbuild	2015 Peak	360/25	0.31	0.70	2.64	7.38	12.75	16.53	13.07	7.76	3.08	0.99	0.51
	2015 Average	216/15	0.19	0.42	1.58	4.43	7.65	9.92	7.84	4.66	1.85	0.59	0.30
	2025 Peak	360/25	0.31	0.70	2.64	7.38	12.75	16.53	13.07	7.76	3.08	0.99	0.51
Carver Co. Tap to Augusta 115kV Sgl Ckt With 13.8kV Distribution Underbuild	2015 Peak	107/25	0.11	0.25	0.89	2.54	4.68	7.07	5.17	2.62	0.89	0.25	0.11
	2015 Average	64/15	0.07	0.15	0.53	1.52	2.80	4.23	3.09	1.57	0.53	0.15	0.07
	2025 Peak	120/25	0.11	0.22	0.80	2.15	3.55	4.54	4.01	2.43	0.97	0.32	0.17

Considerable research has been conducted throughout the past three decades to determine whether exposure to power-frequency (60 hertz) magnetic fields causes biological responses and health effects. Epidemiological and toxicological studies have shown no statistically significant association or weak associations between MF exposure and health risks. Public health professionals have also investigated the possible impact of exposure to EMF upon human health for the past several decades. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or health effects continues to be debated.

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 (Olden, 1999). The NIEHS concluded that the scientific evidence linking MF 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 MFs 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.

In 2007, the World Health Organization ("WHO") concluded a review of the health implications of electromagnetic fields. In this report, the WHO stated:

> Uncertainties in the hazard assessment [of epidemiological studies] include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern. (*Environmental Health Criteria Volume N°238 on Extremely Low Frequency Fields* at p. 12, WHO (2007)).

Also, regarding disease outcomes, aside from childhood leukemia, the WHO stated that:

> A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease. (*Id*. at p.12.)

Furthermore, in their "Summary and Recommendations for Further Study" WHO emphasized that:

> The limit values in [ELF-MF] exposure guidelines [should not] be reduced to some arbitrary level in the name of precaution. Such practice undermines the scientific foundation on which the limits are based and is likely to be an expensive and not necessarily effective way of providing protection. (*Id.* at p. 12).

Although WHO recognized epidemiological studies indicate an association on the range of three to four mG, WHO did not recommend these levels as an exposure limit but instead provided: "The best source of guidance for both exposure levels and the principles of scientific review are international guidelines." *Id*. at pp. 12-13. The international guidelines referred to by WHO are the International Commission on Non-Ionizing Radiation Protection ("ICNIRP") and the Institute of Electrical and Electronic Engineers ("IEEE") exposure limit guidelines to protect against acute effects. *Id*. at p. 12. The ICNIRP-1998 continuous general public exposure guideline is 833 mG and the IEEE continuous general

public exposure guideline in 9,040 mG. In addition, WHO determined that "the evidence for a casual relationship [between ELF-MF and childhood leukemia] is limited, therefore exposure limits based on epidemiological evidence is not recommended, but some precautionary measures are warranted." *Id.* at 355-56.

WHO concluded that:

> given both the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia, and the limited impact on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. Provided that the health, social and economic benefits of electric power are not compromised, implementing very low-cost precautionary procedures to reduce exposure is reasonable and warranted. (*Id.* at p. 13).

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

> Research on the health effects of EMF has been carried out since the 1970s. Epidemiological studies have mixed results – some have shown no statistically significant association between exposure to EMF and health effects, some have shown a weak association. More recently, laboratory studies have failed to show such an association, or to establish a biological mechanism for how magnetic fields may cause cancer. A number of scientific panels convened by national and international health agencies and the United States Congress have reviewed the research carried out to date. Most researchers concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe. (*Id.* at p. 1.)

The Public Service Commission of Wisconsin ("PSCW") has periodically reviewed the science on MFs since 1989 and has held hearings to consider the topic of MF and human health effects. The most recent hearings on MF were held in July 1998. Recently, January 2008, the PSC published a fact sheet regarding MFs. In this fact sheet the PSC noted that:

> Many scientists believe the potential for health risks for exposure to EMF is very small. This is supported, in part, by weak epidemiological evidence and the lack of a plausible biological mechanism that explains how exposure to EMF could cause disease. The magnetic fields produced by electricity are weak and do not have enough energy to break chemical bonds or to cause mutations in DNA. Without a mechanism, scientists have no idea what kind of exposure, if any, might be harmful. In addition, whole animal studies investigating long-term exposure to power frequency EMF have shown no connection between exposure and cancer of any kind. (*EMF-Electric & Magnetic Fields*, PSC (January 2008)).

The Minnesota Public Utilities Commission, based on the Working Group and World Health Organization findings, has repeatedly found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." *In the Matter of the Application of Xcel Energy for a Route Permit for the Lake Yankton to Marshall Transmission Line Project in Lyon County*, Docket No. E-002/TL-07-1407, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Xcel Energy for the Lake Yankton to Marshall Transmission Project at p. 7-8 (Aug. 29, 2008); *See also*, *In the Matter of the Application for a HVTL Route Permit for the Tower Transmission Line Project*, Docket No. ET-2, E015/TL-06-1624, Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Minnesota Power and Great River Energy for the Tower Transmission Line Project and Associated Facilities at p. 23 (Aug. 1, 2007)("Currently, there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects.").

The Commission again confirmed its conclusion regarding health effects and MFs in the Brookings County – Hampton 345 kV Route Permit proceeding ("Brookings Project"). In the Brookings Project Route Permit proceeding, Applicants Great River Energy and Xcel Energy and one of the intervening parties provided expert evidence on the potential impacts of electric and magnetic fields on human health. The ALJ in that proceeding evaluated written submissions and a day-and-half of testimony from these two expert witnesses. The ALJ concluded: "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for [EF or MF] exposure." *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, ALJ Findings of Fact, Conclusions and Recommendation at Finding 216 (April 22, 2010 and amended April 30, 2010). The Commission adopted this finding on July 15, 2010. *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474, Order Granting Route Permit (September 14, 2010).

5.2.3 Stray Voltage

"Stray voltage" is a condition that can occur on the electric service entrances to structures from distribution lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Because transmission lines convey power for subsequent distribution and are not connected to non-utility structures, stray voltage is not encountered in such lines.

5.2.4 Farming, Vehicle Use and Metal 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 a couple of methods, including:

i. one or more of the fence insulators can be shorted out to ground with a wire when the charger is disconnected; or
ii. an electric filter can be installed that grounds out charges induced from a power line while still allowing the charger to be effective.

Farm equipment, passenger vehicles and trucks may be safely used under and near power lines. The power lines will be designed to meet or exceed minimum clearance requirements with respect to roads, driveways, cultivated fields and grazing lands specified by the 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 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 discouraged within the right-of-way itself because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the right-of-way could damage a transmission line. As a result, NESC guidelines establish clear zones for transmission

facilities. Metal buildings may have unique issues. For example, metal buildings near power lines of 200 kV or greater must be properly grounded. Any person with questions about a new or existing metal structure can contact Xcel Energy for further information about proper grounding requirements.

6.0 ENVIRONMENTAL INFORMATION

This section provides a description of the environmental setting, potential impacts and mitigative measures Xcel Energy has proposed, where appropriate, to minimize the impacts of siting, constructing and operating the Project. If the proposed transmission lines were removed in the future, the land could be restored to its prior condition and/or put to a different use. The majority of the measures proposed are part of the standard construction process at Xcel Energy. Unless otherwise identified in the following text, the costs of the mitigative measures proposed are considered nominal.

6.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The proposed transmission line rebuilds and new line construction are located in McLeod and Carver Counties. Townships affected by the rebuild will include Helen, Young America, Waconia, Benton, and Dahlgren. The Project Area begins at the proposed Diamond Substation and extends east, primarily along existing transmission right-of-way (Line #0771), and continues along transmission line 0740 and terminates at Structure #142 on the west side of Aue Lake (located approximately 3.5 miles west of Chaska, MN). Along the route, two segments of new transmission line construction totaling 2.8 miles, located in and around of the city of Norwood Young America, will be designed to be located approximately 5 feet outside of existing road right-of-ways. Additionally two transmission line segments totaling 0.8 mile in length within the City limits of Norwood Young America will be decommissioned and disassembled.

The proposed transmission line rebuild and new line construction are primarily located in agricultural areas. Segments of the line being decommissioned are located in the City of Norwood Young America. This is the only area along the route that is considered urban.

The approximate 658 acre Project Area (Appendix B: General Vicinity Map - Segments 1-7) is located within the Minnesota and Northeast Iowa Morainal Section (222M), a section within the biogeographic province known as the Eastern Broadleaf Forest Province under the Ecological Classification System ("ECS") developed by the Minnesota Department of National Resources ("MnDNR") and the United States Forest Service ("USFS") (MNDNR, 2010). The Project Area is further located within the Big Woods subsection of the Minnesota and Northeast Iowa Morainal Section.

The dominant landscape features in the general area are described as level topped hills bounded by smooth side slopes per the ECS. There are broad level areas between these hills that contain lakes and peat bogs, with the area's drainage controlled by the level of these lakes. The topography of this ECS subsection is gently to moderately rolling. The

topography of the Project Area, however, is relatively level and ranges from 1,025 feet above mean sea level in elevation in the west to 915 feet above mean sea level as the transmission line route travels to the east.

Geologic and topographic information from the MnDNR and the United States Geological Survey ("USGS") was analyzed to determine the existing conditions within the Project Area and the potential effects on those conditions.

Pre-settlement vegetation consisted primarily of oak woodland and maple basswood forest. The majority of the Project Area has now been converted to primarily agricultural use with only a small portion consisting of either upland forest or wetlands. The agricultural areas are utilized mainly for corn and soybean production. Other portions cross or pass by water features (Buffalo Creek and many unnamed drainages, Tiger Lake, Braunworth Lake, Hydes Lake, Rice Lake, Barlous Lake, Winkler Lake, and Miller Lake).

6.2 HUMAN SETTLEMENT

6.2.1 Public Health and Safety

The Project will be designed in compliance with local, state, NESC, and Xcel Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths. Xcel Energy construction crews and/or contract crews will comply with local, state, NESC, and Xcel Energy standards regarding installation of facilities and standard construction practices. Established Company and industry safety procedures will be followed during and after installation of the transmission lines. This will include clear signage during all construction activities.

The proposed transmission lines will be equipped with protective devices to safeguard the public from the transmission lines if an accident occurs, such as a structure or conductor falling to the ground. The protective devices include breakers and relays located where the line connects to the substation(s). The protective equipment will de-energize the line should such an event occur. Proper signage will be posted warning the public of the risk of coming into contact with the energized equipment.

Mitigative Measures

There are no mitigative measures necessary to address human health and safety.

6.2.2 Commercial, Industrial, Residential Land Use

Land use in the Project Area is primarily agriculture and undeveloped/open-space, with the exception of the portions that are proposed to be deconstructed in the City of Norwood

Young America, which has residential and commercial land use. The City of Norwood Young America is the largest urban area in the local region, with a population of over 3,100 (2000 Census). Portions of the proposed new line construction along State Highway 25 to the northwest of the city of Norwood Young America are within the current city limits as indicated on the attached Appendix B: Landuse Map. This area is currently zoned for agricultural use though it is planned to be added to the Metropolitan Councils Municipal Utility and Service Area between 2020 and 2030. The proposed new line should have minimal impact on the amount of developable ground in this area as it is being sited along side of existing highway right-of-ways.

The closest commercial business to the portion of the Project with new line construction is located approximately 190 feet from the line. This structure is located on the northern end of Norwood Young America between Central Avenue N. and State Highway 25. State Highway 25 separates the two features (see Appendix B: Environmental Features Map – Segment 3). The closest urban residence to the new line construction is located on the northwest side of Norwood Young America and is approximately 141 feet from the proposed line with State Highway 25 separating the two features as indicated on the attached Appendix B: Environmental Features Map – Segment 3). The closest rural residence is located approximately 65 feet from the proposed line at a residence in Benton Township in the southwest quadrant of the intersection of County Highway 51 and 114th Street as indicated on the attached Appendix B: Environmental Features Map – Segment 6). The closest farmstead residence is located approximately 55 feet from the proposed line at a residence in Benton Township which is approximately 1,000 feet north of the previously mentioned rural residence. Segment 6 is a new transmission line portion of the Project.

The closest commercial business to the portion of the Project where there will be a transmission line rebuild is located approximately 200 feet from the line. This structure is east of the intersection of State Highway 5 and 106th Street (see Appendix B: Environmental Features Map – Segment 6). The proposed transmission line rebuilds are not near any urban areas or residences. The closest farmstead residence to a rebuild segment is located approximately 15 feet from the line at a rental property in Benton Township at the southwest quadrant of the intersection of State Highway 284 and County Road 153 as indicated on the attached Appendix B: Environmental Features Map – Segment 7. The closest rural residence to the rebuild line is approximately 21 feet at a residence located in the northwest quadrant of the intersection of County Highway 34 and State Highway 25 in Young America Township as indicated on the attached Appendix B: Environmental Features Map – Segment 2.

Classifications of entities noted in the previous sections were determined by referencing the land use description found in the Carver County Parcel Database. The numbers of occupied structures located within various distances from the Project are shown in Table 7 below.

Mitigative Measures

No impacts are anticipated and therefore no mitigative measures are proposed.

TABLE 7
DISTANCE TO OCCUPIED STRUCTURES

Segment	Number of Farmsteads or Residences within 0-50' of Proposed Line	Number of Commercial Operations within 0-50' of Proposed Line	Number of Farmsteads or Residences within 51-100' of Proposed Line	Number of Commercial Operations within 51-100' of Proposed Line	Number of Farmsteads or Residences within 101-200' of Proposed Line	Number of Commercial Operations within 101-200' of Proposed Line
Segment 1	0	0	2	0	3	0
Segment 2	5	0	6	1	8	0
Segment 3	1	0	0	0	6	1
Alternate Segment 3a	9	0	34	1	3	0
Alternate Segment 3b	4	0	0	0	0	0
Segment 4	0	0	1	0	0	0
Segment 5	0	0	0	0	1	1
Alternate Segment 5a	1	0	0	0	1	1
Segment 6	0	0	2	0	3	0
Segment 7	2	0	4	0	5	0

6.2.3 Displacement

No displacement of residential homes or businesses will occur as a result of this Project.

Mitigative Measures

Because no displacement will occur, no mitigative measures are proposed.

6.2.4 Noise

Transmission Line Noise

Transmission lines can generate a small amount of sound energy during corona activity where a small electrical discharge caused by the localized electric field near energized components and conductors ionizes the surrounding air molecules. Corona is the physical manifestation of energy loss, and can transform discharge energy into very small amounts of sound, radio noise, heat, and chemical reactions of the air components. Several factors, including conductor voltage, shape and diameter, and surface irregularities such as scratches, nicks, dust, or water drops can affect a conductor's electrical surface gradient and its corona performance.

Noise emission from a transmission line occurs during certain weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain.

Since human hearing is not equally sensitive to all frequencies of sound, the most noticeable frequencies of sound are given more "weight" in most measurement schemes. The A-weighted scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, which is the A-weighted sound level recorded in units of decibels.

A noise level change of 3 dBA is barely perceptible to human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise level is perceived as a doubling of noise loudness, while a 20 dBA change is considered a dramatic change in loudness. Table 8 below shows noise levels associated with common, everyday sources.

In Minnesota, statistical sound levels (L Level Descriptors) are used to evaluate noise levels and identify noise impacts. The L_5 is defined as the noise level exceeded 5% of the time, or for three minutes in an hour. The L_{50} is the noise level exceeded 50% of the time, or for 30 minutes in an hour.

Land areas, such as picnic areas, churches, or commercial spaces, are assigned to an activity category based on the type of activities or use occurring in the area. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification ("NAC") is listed in the MPCA noise regulations to distinguish the categories.

TABLE 8
COMMON NOISE SOURCES AND LEVELS

Sound Pressure Level (dBA)	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: Minnesota Pollution Control Agency (2008).

Table 9 identifies the MPCA established daytime and nighttime noise standards by NAC. The standards are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time within the hour.

TABLE 9
NOISE STANDARDS BY NOISE AREA CLASSIFICATION
(dBA)

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Approximately 99 residences and businesses are located within 400 feet of the proposed route. Of these structures, 77 are located along a proposed rebuild route and 34 (12 overlap) are located along the new line construction route. The closest distance that a residence is located to a proposed transmission line rebuild is approximately 15 feet, which occurs in

Young America Township. The closest distance that a residence is located to the proposed new line construction is 55 feet which occurs in Benton Township.

Noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually audible. Additionally, noise levels from the proposed 115/69 kV double circuit transmission lines are expected to be only slightly higher than the existing 69 kV transmission lines in the Project Area. Therefore, noise levels from the new line and double circuit line should not be noticeably greater than existing levels.

The EPRI "Transmission Line Reference Book, 345kV and Above", Chapter 6, provides empirically-derived formula for predicting audible noise from overhead transmission lines. Computer software produced by the Bonneville Power Administration (BPA)(BPA, 1977) is also frequently used to predict the level of audible noise from power transmission lines that is associated with corona discharge. Audible noise is predicted for dry and wet conditions, with wet conditions representing a worst case. These procedures are considered to be reliable and represent International best practice.

The Project consists of a 115 kV transmission line and a 115/69 kV double circuit transmission line. Computer modeling performed by Xcel Energy using the BPA 1977 software under the worst case wet conditions scenario indicated that the audible L5 and L50 noise levels (discussed below) measured at the edge of the 100 wide right-of-way (50 feet from centerline) would be at 19.6 and 16.8 dBA, respectively, well below the MPCA nighttime L50 limit of 50 dBA for Noise Area Classification 1. These findings are shown in Table 10.

Table 10
CALCULATED AUDIBLE NOISE (db) FOR PROPOSED 115 KV TRANSMISSION LINE DESIGNS (3.28 FEET ABOVE GROUND)

Structure Type	Noise L5 (50 Feet From Centerline) (Decibels a weighted)	Noise L50 (50 feet From Centerline) (Decibels a weighted)
Braced Post 115kV Steel Pole Single Circuit	18.9	15.4
Braced Post 115kV Steel Pole Single Circuit With Distribution Underbuild	16.6	12.4

Davit Arm 115kV/69kV Steel Pole Double Circuit	16.2	12.7
Davit Arm 115kV/69kV Steel Pole Double Circuit With 12.5kV Distribution Underbuild	15.7	12.2
Davit Arm 115kV/69kV Steel Pole Double Circuit With 34.5kV/34.5kV Distribution Underbuild	19.6	16.8

Transformer Substation Noise

Transformer "hum" is the dominant noise source at substations. Transformer hum is caused by magnetostrictive forces within the core of the transformer. These magnetic forces cause the core laminations to expand and contract, creating vibration and sound at a frequency of 100Hz (twice the a.c. mains frequency), and at multiples of 100Hz (harmonics). Typically, the noise level does not vary with transformer load, as the core is magnetically saturated and cannot produce any more noise.

The nearest occupied homes to the West Waconia and Plato Substations are located 800 feet northwest and 115 feet southeast of the substations, respectively. It would be very unlikely that substation noise would be audible at these homes.

The substations will be designed and constructed to comply with state noise standards established by the Minnesota Pollution Control Agency ("MPCA").

Mitigative Measures

No mitigative measures are proposed since no impacts are anticipated.

6.2.5 Television and Radio Interference

Corona from transmission line conductors can generate electromagnetic "noise" at the same frequencies that radio and television signals are transmitted. This noise can cause interference with the reception of these signals depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

If radio interference from transmission line corona does occur, satisfactory reception from AM radio stations previously providing good reception can be restored by appropriate

modification of (or addition to) the receiving antenna system. AM radio frequency interference typically occurs immediately under a transmission line and dissipates rapidly within the right-of-way to either side.

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

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

A two-way mobile radio located immediately adjacent to and/or behind a large metallic structure (such as a steel tower) may experience interference because of signal-blocking effects. Movement of either mobile unit so that the metallic structure is not immediately between the two units should restore communications. This would generally require a movement of less than 50 feet by the mobile unit adjacent to a metallic tower.

Television interference is rare but may occur when a large transmission structure is aligned between the receiver and a weak distant signal, creating a shadow effect. Loose and/or damaged hardware may also cause television interference. If television or radio interference is caused by or from the operation of the proposed facilities in those areas where good reception is presently obtained, Xcel Energy will inspect and repair any loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the present level, including the appropriate modification of receiving antenna systems if deemed necessary.

Mitigative Measures

No impacts are anticipated and therefore no mitigative measures are proposed. If radio or television interference occurs due to the Project, Xcel Energy will work with the affected landowner to restore reception to pre-Project quality.

6.2.6 Aesthetics

Because the proposed Project will mainly follow existing 69 kV transmission line routes, the Project will have nominal effects on the visual and aesthetic character of the area. The proposed structures for the 115/69 kV double circuit lines will be similar to the other 115/69 kV transmission lines used on the Xcel Energy system. The structures will be about 60 to 105 feet tall and will have an average span of 325 feet. A maximum span of 400 feet will be used between the structures, which will still keep the conductor within the right-of-way under

blowout conditions. The usual right-of-way required for these types of structures is 75 feet wide. The existing transmission line structures vary in height between 50 to 90 feet. By comparison, the proposed transmission line structures will generally be slightly taller, ranging from 60 to 105 feet in height. The overall spacing of the poles will be comparable to the current layout, which varies greatly by engineering and land use constraints.

The finish of the proposed poles will be self-weathering steel. The existing transmission line structures in this area are wood poles, and some of the existing poles are of H-frame construction. The proposed steel poles will give the new transmission line a somewhat cleaner and more modern appearance.

Like the existing 69 kV transmission line, the new single circuit and double circuit transmission line will be visible to area residents. The majority of the landscape in the Project Area is undeveloped and agricultural. The visual effect will depend largely on the perceptions of the observers. The visual contrast added by the transmission structures and lines may be perceived as a visual disruption or as points of visual interest. The transmission lines and substations that already exist in the Project Area will limit the extent to which the new line and substation are viewed as a disruption it the area's scenic integrity.

Mitigative Measures

Although the proposed line will alter views of surrounding land uses, Xcel Energy has identified the route that predominantly uses existing corridors and avoids residences and businesses to the greatest extent practicable. Xcel Energy will work with landowners to identify concerns related to the transmission line aesthetics.

6.2.7 Socioeconomic

Population and economic characteristics based on the 2000 U.S. Census are presented in Table 11.

TABLE 11
POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Minority Population (Percent)	Caucasian Population (Percent)	Per Capita Income	Percentage of Individuals Below Poverty Level

State of Minnesota	5,220,393	11.0	89.0	$23,198	9.5
Carver County	90,043	5.4	94.6	$28,486	3.9
Young America Township	838 (rural)	2.6	97.4	$23,216	2.2
City of Norwood Young America	3,108	1.9	98.1	$18,431	2.7
Benton Township	939	0.5	99.5	$22,652	1.2
Waconia Township	1,284	0.5	99.5	$27,437	2.1
McLeod County	37,165	2.3	97.7	$20,137	6.2
Helen Township	832	1.9	98.1	$21,010	2.0

Source: 2000 U.S. Census: General Demographic Characteristics

According to 2000 Census data, Carver County is 94.6 percent Caucasian, while McLeod County is 97.7 percent Caucasian. In the townships within the Project Area, minority groups in the area constitute a very small percentage of the total population, averaging 1.3 percent.

Per capita incomes within the townships in the Project Area are slightly lower when compared to Carver and McLeod counties on a whole. The proposed route does not contain disproportionately high minority populations or low-income populations.

Approximately 8 to 12 workers will be required by Xcel Energy for transmission line construction. The transmission crews are expected to spend approximately 6 months constructing the project

There will be short-term impacts to community services as a result of construction activity and an influx of contractor employees during construction of the various segments of the Project. Both utility personnel and contractors will be used for construction activities. The communities near the Project should experience short-term positive economic impacts through the use of the hotels, restaurants and other services by the various workers.

It is not expected that additional permanent jobs will be created by the Project. The construction activities will provide a seasonal influx of economic activity into the

communities during the construction phase, and materials such as concrete may be purchased from local vendors. Long-term beneficial impacts from the Project include increased local tax base resulting from the incremental increase in revenues from utility property taxes.

Socioeconomic impacts resulting from the Project will be primarily positive with an influx of wages and expenditures made at local businesses during the construction of the Project, increased tax revenue and increased opportunities for business development.

Mitigative Measures

No mitigative measures are proposed since no impacts are anticipated.

6.2.8 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area, which provide a framework for community unity. The region surrounding the Project Area has cultural values tied to the area's strong German and Scandinavian heritage, and the agricultural and industrial economy. Local community ties relate to work, worship, celebration, and recreation. Examples of area culture and industry include the annual Stiftungsfest (Founder's Day Celebration) held annually on the last full weekend of August in Norwood Young America (Stiftungsfest, 2010), and the annual festivals of Glencoe Days and Holly Days in Glencoe (Glencoe, 2010).

The vast majority of lands outside of the City boundaries remain in agricultural use (Carver County Historical Society and McLeod County Historical Society). Agriculture and farm-related businesses remain central to the regional economy. The area has a diversified agricultural mix of crops and livestock including corn, soybeans, alfalfa as well as hogs and beef cattle.

Construction of the proposed Project is not expected to conflict with the cultural values along the route. No impacts to cultural values are anticipated.

Mitigative Measures

No impacts are anticipated and therefore no mitigative measures are proposed.

6.2.9 Recreation

There are four formal recreational areas located near the Project Area: Friendship Park; Willkommen Park; Meadow Park; and Baylor Regional Park (*see* Appendix B). Friendship Park and Willkommen Park are both located within the City of Norwood Young America approximately 1/3 mile and 1/10 mile south of the Project Area, respectively, in the area of

line retirement. Friendship Park has an ice rink, playground areas as well as soccer and softball fields. Willkommen Park has a baseball field, a pavilion, and other public meeting places.

Meadow Park is located within the city of Cologne nearly 2/3 mile south of the Project Area. This is a small community park with playground equipment. Lastly, Baylor Regional Park, found next to Eagle Lake along County Road 33, is approximately two miles north of the Project Area. The Project is not expected to directly impact any of these recreational resources.

Tiger Lake, Braunworth Lake, Young America Lake, Barnes Lake, Hydes Lake, Rice Lake, Winkler Lake, Benton Lake, Miller Lake and Aue Lake are all located within one mile of the Project Area. Schneewind State Wildlife Management Area ("WMA") is located approximately .75 mile north of the Project Area near Winkler Lake. Patterson Lake WMA is located next to Patterson Lake and is located nearly one mile north of the Project Area. The Project is not expected to directly impact any of these recreational resources.

Mitigative Measures

The Project will be visible from Tiger Lake, Braunworth Lake, Hydes Lake, Rice Lake, Winkler Lake, Miller Lake and Aue Lake, however direct impact to these resources is not expected. If impacts to these resources are encountered during construction of the Project, Xcel Energy will work with the appropriate representatives to minimize any impacts.

6.2.10 Public Services and Transportation

The City of Norwood Young America provides water, sewer and electrical service to its residents. Outside the city limits, along the transmission route, private wells and septic systems are used. Based on comments provided by City staff, no public utility or road improvements projects are currently planned for the area near the existing Xcel Energy transmission line within the City of Norwood Young America.

The Company is working with McLeod County, which is planning for safety upgrade work on County Road 3 within the next five years. Where the Project Area intersects County Road 3, pole locations are being coordinated so that they will not impede the pending alterations.

Regional transportation studies have been undertaken by both the Carver County and the Minnesota Department of Transportation ("MnDOT"). The Carver County regional study reviewed potential expansion of Township Highway 5, and was completed in partnership with Victoria, Waconia, Chanhassen and Norwood Young America (*Carver County Public Works Department,* 2009). This study did not identify any improvements or realignments

within the Project Area. The recommendations nearest the Project Area discuss modifications to the interchange of Trunk Highway 5 and Trunk Highway 212, south of the Project Area.

Impacts to state planning were evaluated through solicitation of formal comment from MnDOT; see Section 7.1.3. A comment letter and portions of a Trunk Highway 5 Corridor Study Report (From Trunk Highway 41 to Trunk Highway 212) were forwarded by MnDOT, and are included in Appendix D. The report from October 2008 does identify potential improvements within the Project Area, including the need to re-align Trunk Highway 5, Carver County Road 34, and construct some city streets on a new location near Norwood Young America. The implementation of these improvements, however, has not been incorporated into any regional traffic plans, and MnDOT does not have any listed short-term projects in the Project Area. Because the plans are preliminary in nature and designs are generalized, no specific impacts to these plans can be assessed. Meetings between the Company, MnDOT and the County in December 2009 indicated that these potential changes may be as much as 30-40 years out and based on the concepts under consideration, no conflicts are anticipated.

Mitigative Measures

Minimal to no impacts to public services are anticipated to occur as a result of the proposed project. Coordination is already under way with McLeod County to coordinate structure placement with upgrades on their County Road 3 and no significant conflicts are anticipated. Future planning for state highway improvement or re-alignments is expected to be negotiated under MnDOT's Accommodation Policy. Although no highway planning is yet underway, Segment 3 involves new right of way along CSAH 25/5. Transmission line planning will be conducted in accordance with MnDOT policies.

6.3 LAND-BASED ECONOMIES

6.3.1 Agriculture

As discussed in Section 6.2.8 both Carver and McLeod counties have strong economic ties to agricultural production. According to the 2007 United States Department of Agriculture ("USDA") Census of Agriculture, Carver County has 800 individual farms, marking a 2% decrease in total number of farms over the previous five years. Agricultural lands cover 169,367 acres, representing over 70% of all lands in Carver County with an average farm size of 212 acres. Carver County ranks among the top 20 counties in production of fruits, tree nuts, and berries (ranking 15th statewide); nursery, greenhouse, floriculture, and sod (ranking 10th statewide); and milk and other bovine dairy products (ranking 13th statewide). Nearly $93 million was generated from both crop and livestock sales in 2007.

McLeod County also has strong economic dependence on agricultural production. According to the 2007 USDA Census of Agriculture, McLeod County has 1,021 individual farms, marking a 3% increase in total number of farms over the previous five years. Agricultural lands cover 243,958 acres, representing over 77% of all land in McLeod County with an average farm size of 239 acres. McLeod County ranks among the top twenty counties in production of cattle and calves (ranking 20th statewide) and milk and other bovine dairy products (ranking 19th statewide). Over $125 million was generated from both crop and livestock sales in 2007.

Construction activities associated with the Project will temporarily access an area of agricultural land estimated at 156 acres. Construction of new transmission structures and removal of existing structures will require repeated access to structure locations to install foundations, structures and conductors. Equipment used in this process includes drill rigs, concrete trucks, backhoes, cranes, boom trucks and assorted small vehicles. Operation of these vehicles on adjoining farm fields can cause rutting and compaction, particularly during springtime and otherwise wet conditions.

Mitigative Measures

Landowners will be compensated for the use of their land through easement payments. Additionally, to minimize loss of farmland and rural properties and to ensure reasonable access to the land near the poles, Xcel Energy intends to place the poles approximately five feet from, and overhang, the roadway right-of-way. When possible, Xcel Energy will attempt to rebuild the transmission lines before crops are planted or following harvest.

Where possible, spring-time construction will be avoided. However, if construction during spring-time is necessary, disturbance to farm soil from access to each structure location will be minimized by using the shortest access route. This may require construction of temporary driveways between the roadway and the structure, but would limit traffic on fields between structures. Construction mats may also be used to minimize impacts on the access paths and in construction areas. Xcel Energy construction teams will work with the property owner, right of way agent, and transmission line engineers to minimize the impact on property through use of the owner's knowledge of the property.

In addition to payments for easements acquired, Xcel Energy will compensate landowners for any crop damage and soil compaction that occurs as a result of the Project.

6.3.2 Forestry

There are no forested areas where species are harvested along the proposed transmission line rebuild route or the proposed new transmission line route. The primary tree cover in the area

is associated with waterways and homesteads. No economically significant forestry resources are located along the proposed transmission line rebuild route or at the proposed Plato substation relocation.

Mitigative Measures

No impacts are anticipated and therefore no mitigative measures are proposed.

6.3.3 Tourism

Helen Township in McLeod County and Benton, Waconia and Young America Townships in Carver County are primarily agricultural areas. Primary tourism activities in the region include camping, recreational use of the regions lakes for fishing and boating, bicycling, or cross country skiing. Nearby tourist attractions listed on the MN Home Town Locator web site include the Spam Museum in Austin and the Science Museum of Minnesota in St. Paul.

Mitigative Measures

No impacts are anticipated and therefore no mitigative measures are proposed.

6.3.4 Mining

According to MnDOT county pit maps for Carver and McLeod counties, there are gravel pits, rock quarries and commercial aggregate sources in the vicinity of the Project Area. Of these, the closest is an inactive gravel pit located approximately 1.5 miles south of the west end of the Project Area, west of the Glencoe Municipal Airport. Because no existing gravel and rock resources are being utilized within the Project Area, no impacts are anticipated. Unknown resources that may exist in the Project Area would be situated in close proximity to existing utility and roadway ROW, making development unlikely.

Mitigative Measures

No impacts to mining operations are anticipated and therefore no mitigative measures are proposed.

6.4 Archaeological and Historical Resources

A total of 53 previously recorded cultural resource properties were located within one mile of the proposed Project Area. In August 2009, a review of records at the Minnesota State Historic Preservation Office ("SHPO") and the Minnesota Office of the State Archaeologist ("OSA") identified 30 archaeological sites and 23 inventoried historic architectural properties located within one mile of the Project Area. Of the 30 archaeological sites, 27 consist of prehistoric artifacts scatters, two are single artifact finds, and one is a historical documentation record of an abandoned townsite. Two of the previously recorded artifact scatters are Considered Eligible Findings ("CEF") by the SHPO due to the potential of these

archaeological sites to contain significant information regarding the prehistoric occupation of the region. The eligibility of the remaining inventoried archaeological sites for inclusion on the National Register of Historic Places ("NRHP") is unevaluated. A summary of the inventoried archaeological and architectural sites is provided in Table 12.

TABLE 12
PREVIOUSLY IDENTIFIED HISTORIC PROPERTIES NEAR THE PROJECT

Type of Historic Property	Inventory Number	Description	NRHP Status
Archaeological	21CR0007	Arlo Hasse	unevaluated
Archaeological	21CR0012	Trende	unevaluated
Archaeological	21CR0013	Miller Lake	unevaluated
Archaeological	21CR0018		unevaluated
Archaeological	21CR0019		unevaluated
Archaeological	21CR0023	Manteufel	unevaluated
Archaeological	21CR0024		unevaluated
Archaeological	21CR0025		unevaluated
Archaeological	21CR0026		unevaluated
Archaeological	21CR0027	Barlous Lake	unevaluated
Archaeological	21CR0028	Barlay	unevaluated
Archaeological	21CR0029		unevaluated
Archaeological	21CR0030	Joos	unevaluated
Archaeological	21CR0055	Hardy Hodge	unevaluated
Archaeological	21CR0072	Carver Creek No. 1	CEF
Archaeological	21CR0073	Carver Creek No. 2	CEF
Archaeological	21CR0077	Young America	unevaluated
Archaeological	21CR0082	Roepke	unevaluated
Archaeological	21CR0086	Schmid	unevaluated
Archaeological	21CR0089		unevaluated
Archaeological	21CR0090		unevaluated
Archaeological	21CR0121		unevaluated
Archaeological	21CR0122		unevaluated
Archaeological	21CR0146	Laumann	unevaluated
Archaeological	21CR0147	Pautsch	unevaluated
Archaeological	21Crag	Hasse IV	unevaluated
Archaeological	21CRah	Hasse V	unevaluated
Archaeological	21CRai	Hasse VI	unevaluated
Archaeological	21CRe	Benton	unevaluated
Archaeological	21MC0006		unevaluated
Architectural	CR-BNT-005	Johann Schimmelphennig Farmstead	NRHP
Architectural	CR-BNT-123	Round Barn	unevaluated
Architectural	CR-BNT-127	farmhouse	unevaluated
Architectural	CR-BNT-128	farmhouse	unevaluated
Architectural	CR-DHL-001	farmhouse	unevaluated
Architectural	CR-DHL-018	Bridge No. 4766	unevaluated

Type of Historic Property	Inventory Number	Description	NRHP Status
Architectural	CR-DHL-048	Klepperich Farmstead	CEF
Architectural	CR-DHL-049	Schmidt Farmstead	unevaluated
Architectural	CR-YAC-001	Chicago Northwestern Railroad Depot	unevaluated
Architectural	CR-YAC-002	Henry Bruckschen House	unevaluated
Architectural	CR-YAC-003	Humboldt Lodge No. 312	unevaluated
Architectural	CR-YAC-004	Young America City Hall	NRHP
Architectural	CR-YAC-005	St. John's Lutheran Church	unevaluated
Architectural	CR-YAC-006	Chicago Northwestern Agent's House	unevaluated
Architectural	MC-HEL-001	school	unevaluated
Architectural	MC-HEL-006	Bridge No. 5326	unevaluated
Architectural	MC-HEL-007	Bridge No. L0302	unevaluated
Architectural	MC-PLC-001	building	unevaluated
Architectural	MC-PLC-002	Plato Garage	unevaluated
Architectural	MC-PLC-005	Diedrich Bergman House	unevaluated
Architectural	MC-PLC-006	Plato Public School	unevaluated
Architectural	MC-PLC-007	Plato Water Tower	unevaluated
Architectural	MC-PLC-008	St. John's Evangelical Lutheran Church	unevaluated

Of the 23 historic architectural properties two are listed on the NRHP, and one is a CEF. The two NRHP properties are the Johann Schimmelphennig Farmstead, located approximately one mile east of the City of Norwood Young America, Carver County, and the Young America City Hall, located in the northeastern segment of Norwood Young America, Carver County. The CEF is the Klepperich Farmstead located near the eastern terminus of the Project Area. The eligibility of the remaining inventoried historic architectural properties is unevaluated.

All of the 53 cultural resource properties identified are located outside the 75 foot transmission line right-of-way and will not experience direct impacts resulting from the construction of this Project. The two NRHP listed properties and the three CEF properties are, on average, one-half mile distant from the proposed Project Area. Further, the existing and proposed transmission route in proximity to the listed or eligible properties will consist of transmission line rebuild. The proposed construction will constitute the replacement of pre-existing features and not create new indirect visual impacts. This also applies to the 48 remaining, unevaluated properties.

Mitigative Measures

The proposed Project Area will avoid impacts to identified archaeological and historic architectural resources to the extent possible. Should a specific impact be identified, Xcel Energy will consult with SHPO on whether the resource is eligible for listing in the NRHP. While avoidance would be a preferred action, mitigation for Project-related impacts on

NRHP-eligible archaeological and historic resources may include resource investigations and/or additional documentation through data recovery.

6.5 NATURAL ENVIRONMENT

6.5.1 Air Quality

Potential air quality effects related to transmission facilities include fugitive dust emissions during construction, exhaust emissions from construction equipment and ozone generation during transmission line operation (Jackson et al., 1994). All of these potential effects are considered to be relatively minor, and all but the ozone effects are short-term.

Corona consists of the breakdown or ionization of air within a few centimeters of conductors. Usually some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona. Corona can produce ozone and oxides of nitrogen in the air surrounding the conductor. Ozone also forms in the lower atmosphere from lightning discharges, and from reactions between solar ultraviolet radiation and air pollutants, such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight, and inversely proportional to humidity. Thus humidity or moisture, the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen molecules and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short lived.

State and federal governments currently regulate permissible concentrations of ozone (0_3) and nitrogen oxides (NO_X). Ozone forms in the atmosphere when nitrogen oxides and volatile organic compounds react in the presence of heat and sunlight. Air pollution from cars, trucks, power plants and solvents contribute to the concentration of ground-level ozone through these reactions. The national ozone standard is 0.075 parts-per-million (ppm) during an eight-hour averaging period. The state ozone standard is 0.08 ppm based upon the fourth-highest eight-hour daily maximum average in one year. Both averages must be compared to the national and state standards because of the different averaging periods. Calculations done for a 345 kV project showed that the maximum one hour concentration during foul weather (worst case) would be 0.0007 ppm. This is well below both the federal and state standards. Lower voltage lines would have correspondingly lower concentrations. Most calculations of the production and concentration of ozone assume high humidity or rain, with no reduction in the amount of ozone due to oxidation or air movement. These calculations would therefore overestimate the amount of ozone that is produced and concentrated at ground level. Studies designed to monitor the production of ozone under

transmission lines have generally been unable to detect any increase due to the transmission line facility.

Minor temporary effects on air quality are anticipated during construction of the proposed rebuild and new transmission lines, as a result of exhaust emissions from construction equipment and other vehicles, and from fugitive dust that becomes airborne during dry periods of construction activity.

The magnitude of air emissions during construction is influenced by weather conditions and the type of construction activity. Exhaust emissions, primarily from diesel equipment, will vary with the phase of construction. Adverse effects on the surrounding environment are expected to be negligible because of the short and intermittent nature of the emission and dust-producing construction phases.

Mitigative Measures

Xcel Energy will employ Best Management Practices ("BMPs") to minimize the amount of fugitive dust created by the construction process. Tracking control at access roads and wetting surfaces are examples of BMPs that will be used to minimize fugitive dust. Based upon this, Xcel Energy anticipates nominal impacts to air quality. Therefore, no other mitigative measures are proposed.

6.5.2 Water Quality

Segment 1 of the Project crosses the 100 year floodplain of Buffalo Creek in two locations. According to FEMA Flood Insurance Rate Maps (FEMA, 1992), Segment 1 will cross the floodplain for distances of 0.55 miles and 0.65 miles immediately southwest of the Plato Substation. Refer to Appendix B: Environmental Features Map – Segment 1 for the location of the floodplain crossings. The crossings occur in predominately agricultural fields in an area of existing line upgrade. The Plato Substation is located outside of this floodplain area.

Various large wetland complexes and small isolated wetlands are located through the Project Area, although a higher concentration of wetlands exists near the midsection of the proposed transmission route near Norwood Young America. Many of these wetlands are adjacent to the various lakes that lie in close proximity to the Project Area. The National Wetlands Inventory ("NWI") was reviewed to assess which wetlands may be present within the Project Area. Note that the NWI has not been field verified and sometimes contains inaccuracies; however, it is a good tool for initial wetland identification and assessment.

In total, 69 separate wetlands consisting of 14 different wetland types were identified within the 200 foot wide corridors for rebuild and retired segments and the 400 foot wide corridors for new construction segments. Overall, the 200 and 400 foot wide transmission line corridors of the existing line and line to be retired extends approximately 23.8 miles and encompasses approximately 658 acres, of which approximately 56.5 acres (8.6%) are wetlands (*see* Appendices B.1.a – B.1.e). Based on average spacing figures it is anticipated that approximately 455 transmission poles will be necessary to complete the proposed construction. Of these, 49 will be required for new transmission line construction. It is estimated that 61 of these poles will fall within wetlands; 12 of which will be associated with new transmission line construction.

Of the wetlands present within the Project Area, all but three are classified as Palustrine type wetlands (*see* Appendices B.1.d – B.1.e). The other wetland types within the Project Area are Lacustrine, which are associated with lakes.

The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, emergents, mosses or lichens (Cowardin et al. 1979). Of those wetlands the majority contain emergent vegetation with some displaying a mixture of shrubs and herbaceous vegetation. Additionally, three of the Palustrine wetlands have no vegetation and contain unconsolidated bottoms. Lacustrine wetland systems are found in the shallow protected areas of lakes with water depth in the deepest part of the wetland basin greater than 6.6 feet. The areas intersected by the proposed route do not appear to be as deep as 6.6 feet, but they are included as part of the same basin. The PWI also identifies protected wetlands, of which three are shown to intersect the Project Area. These wetlands, 10-180W, 188W and 189W are located near the middle of the Project (*see* Appendices B.2.c – B.2.d).

The proposed transmission line rebuild will have minor, mostly short term effects on surface water resources. Most potential effects on surface waters will be related to reconstruction of the transmission line across wetlands proximal to the existing transmission corridor. The Project could require wetland and water resource approvals from the U.S. Army Corps of Engineers ("USACE"), MnDNR, Carver County, and McLeod County. These agencies administer regulatory programs of the federal Clean Water Act and Rivers and Harbors Act, the Minnesota Public Water Resources Act and Utility Crossing Licenses, and the Minnesota Wetland Conservation Act ("WCA").

The wetlands identified in and near the proposed Project route are listed in Table 13 and shown in Appendices B.2.a – B.2.e. Surface water resources in the vicinity of the proposed Project include a few relatively small wetlands regulated under the WCA, MnDNR Public Waters and Water Courses, and USACE jurisdictional wetlands. WCA jurisdictional wetlands

include farmed or partially farmed wetlands, Type 2 wet meadows, and Type 3 shallow marshes. These small, isolated wetlands may lack USACE jurisdiction.

TABLE 13
WETLANDS IDENTIFIED NEAR THE PROJECT

County	Cowardin Type	Count	Approx. Area (Acres)
Carver	L1UBH	3	1.04
Carver	PEM/SS1C	1	0.33
Carver	PEM/SS1Cd	1	0.78
Carver	PEMA	7	7.65
Carver	PEMAd	5	3.44
Carver	PEMC	23	14.43
Carver	PEMCd	14	10.33
Carver	PEMCx	1	0.02
Carver	PEMF	5	14.66
Carver	PEMFd	2	2.11
Carver	PSS1/EMCd	1	1.10
Carver	PUB/EMF	1	0.03
Carver	PUBF	1	0.09
Carver	PUBGd	1	0.13
McLeod	PEMA	1	0.44
McLeod	PEMC	2	0.01

Mitigative Measures

Xcel Energy will design the Project to avoid and minimize wetland impacts, and will apply erosion control measures identified in the MPCA Storm Water Best Management Practices Manual, such as using silt fence to minimize impacts to adjacent water resources. During construction, Xcel Energy will control operations to minimize and prevent material discharge to surface waters. If materials do enter streams, they will be promptly removed and properly disposed of to the extent feasible.

Disturbed surface soils will be stabilized at the completion of the construction process to minimize the potential for subsequent effects on surface water quality. Xcel Energy will minimize impacts to public waters and public water wetlands to the greatest extent possible. By maximizing the typical span length in these areas, permanent impacts to these areas can be minimized.

The transmission line rebuild may require waters and wetlands permits, letters of no jurisdiction, or exemptions from the USACE, MnDNR Division of Waters, and Carver or McLeod counties. Wetland and surface water impacts will be avoided and minimized to the extent practicable. After coordination and application submission, authorization from the

USACE would likely fall under a Letter of Permission (LOP-05-MN) or the utility line discharge provision of a Regional General Permit (RGP-3-MN). The MnDNR Division of Waters requires a Public Waters Work Permit for any alteration of the course, current, or cross-section below the ordinary high water level of a Public Water or Watercourse. No such alterations are anticipated. Carver and McLeod counties administer the WCA in the Project Area. It is likely that wetland impact minimization will allow the Project to be eligible for a WCA de minimis or utilities exemption. If that is not the case, WCA permits will be required.

Minnesota Statutes Section 84.415 requires Xcel Energy to obtain a license from the MnDNR Division of Lands and Minerals for the passage of any utility over, under, or across any state land or public waters. Therefore, Xcel Energy will either confirm the applicability of existing licenses for these crossings or obtain new utility crossing licenses prior to construction.

The MPCA regulates construction activities that may impact storm water under the Clean Water Act. In the event that a National Pollutant Discharge Elimination System ("NPDES") construction storm water permit and Stormwater Pollution Prevention Plan ("SWPPP") is required for the Project, Xcel Energy will obtain the permit and SWPPP. An NPDES permit is required for owners or operators for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources.

6.5.3 Flora

Land cover in the Project Area consists of cropland, grassland, wetland, and small areas of woodland and residential/industrial development. Cropland consists of primarily corn and soybeans. Grasslands are dominated primarily by smooth brome, Kentucky bluegrass, red clover, alfalfa, and goldenrod. Reed canary grass, cattail, cottonwood, sandbar willow, and sedges are the primary species in wetlands. Native grassland is relatively scarce in the Project Area. Native prairie species are discussed in subsequent sections of this Application. Transmission line construction impacts to trees and woodlands will be minimized because the transmission line rebuild will follow existing right-of-way. Areas where new transmission line construction is planned are primarily agricultural (*see* Appendices B.1.c – B.1.d). For a discussion on impacts to agriculture, please see Section 6.3.1.

Mitigative Measures

To minimize impacts to trees in the Project Area, Xcel Energy will limit tree clearing and removal to the transmission line right-of-way, areas that limit construction access to the Project Area, and areas that impact the safe operation of the facilities.

6.5.4 Fauna

Two MnDNR Wildlife Management Areas ("WMAs") are located in the vicinity of the Project (Minnesota DNR 2008, Appendix B: Environmental Features Map – Segment 6 and 7). The Schneewind WMA is located approximately one mile east of the West Waconia Substation location in Carver County, covers approximately 49 acres and is composed primarily of wetland (DNR Public Water 08-18P) and grassland. The Patterson Lake WMA is located near Patterson Lake and is situated approximately one mile north of the Project Area.

The croplands, grasslands, wetlands, and woodlands in the area provide habitat for a variety of wildlife. Wildlife and other organisms that inhabit the Project Area include small mammals such as mice, voles, and ground squirrels; large mammals such as white-tailed deer; waterfowl and other water birds like pelicans and egrets, songbirds, raptors, upland gamebirds; and reptiles/amphibians such as frogs, salamanders, snakes, and turtles. Lists of mammals, birds, amphibians, and reptiles that are representative of the habitats of the area are included in Appendix C. These lists were compiled from knowledge of the area, (Hazard, 1982, Janssen, 1987, and LeClere, 2008).

Wildlife that resides within the construction zone will be temporarily displaced to adjacent habitats during the construction process. It is anticipated that fish and mollusks that inhabit the local watercourses will not be affected by transmission line rebuild or new lines.

The reconstructed transmission line may affect raptors, waterfowl and other bird species. Birds have the potential to collide with all elevated structures, including power lines. Avian collisions with transmission lines can occur in proximity to agricultural fields that serve as feeding areas, wetlands and water features, and along riparian corridors that may be used during migration.

The electrocution of large birds, such as raptors, is more commonly associated with small distribution lines than large transmission lines. Electrocution occurs when birds with large wingspans come in contact with two conductors or a conductor and a grounding device. Xcel Energy transmission and distribution line design standards provide adequate spacing to eliminate the risk of raptor electrocution and will minimize potential avian impacts of the proposed Project.

Mitigative Measures

It is anticipated that most wildlife displacement and habitat impacts will be temporary. Consequently, no wildlife population mitigation measures are proposed.

Xcel Energy has been working with various state and federal agencies for over 20 years to address avian issues as quickly and efficiently as possible. In 2002, Xcel Energy Operating Companies, including Xcel Energy, entered into a voluntary Memorandum of Understanding ("MOU") with the U.S. Fish and Wildlife Service ("USFWS") to work together to address avian issues throughout its service territories. The MOU sets forth standard reporting methods and the development of Avian Protection Plans ("APP") for each state that Xcel Energy serves. APPs include designs and other measures aimed at preventing avian electrocutions, as described in guidance provided by the Avian Power Line Interaction Committee ("APLIC" 2006) and the guidelines for developing APPs (APLIC and USFWS, 2005). The APP for the Minnesota Territory is complete and retrofit actions for areas with potential avian impacts are underway across the territory. Xcel Energy also addresses avian issues related to transmission projects by:

- Working with resource agencies such as the MnDNR and the USFWS to identify areas that may be appropriate for marking transmission line shield wires with bird diverters; and
- Attempting to avoid areas known as primary migration corridors or migratory resting areas.

The Project has been assessed for areas with potential avian issues. Areas where bird diverters might be warranted have been identified. These areas include spans of transmission line that run adjacent to Tiger Lake, Braunworth Lake, Rice Lake, Winkler Lake, and Hydes Lake. Locations where Swan Flight Diverters ("SFDs") will be installed are shown on Exhibits B.2.a through B.2.e. In most cases, the shield wire of an overhead transmission line is the most difficult part of the structure for birds to see. Xcel Energy has successfully reduced collisions on certain transmission lines by marking the shield wires with SFDs, which are pre-formed spiral shaped devices made of polyvinyl chloride that are wrapped around the shield wire.

6.6 Rare and Unique Natural Resources

A request for a Natural Heritage Database Search and comments regarding rare species and natural communities for the Project Area was submitted to the MnDNR on October 2, 2009. The results of the MnDNR Natural Heritage Database Search are included in

Appendices B.1.a – B.1.e. The following assessment is based on MnDNR response, a review of the Natural Heritage Database that is licensed to Xcel Energy by the MnDNR, and other state and federal rare species and natural community information.

There are seven (7) known occurrences of rare species and sensitive natural communities within 1.5 miles of the Project Area as indicated in Table 14 below. These occurrences include four (4) vertebrate species, two native plant communities of undetermined class, and one colonial waterbird nesting area. Three of the seven records are located within 0.5 mile of the Project Area, which include the American Bittern, Bald Eagle and a native plant community of an undetermined class. The native plant community was mapped by the Minnesota DNR County Biological Survey (Minnesota DNR, 2008b).

TABLE 14
RARE AND UNIQUE RESOURCES

Common Name	Scientific Name	Type	MN Status [1]	Last Obs.	Proximity (Miles)
American Bittern	*Botaurus lentiginosus*	Vertebrate	No State Status	1991	1.0-1.5
American Bittern[2]	*Botaurus lentiginosus*	Vertebrate	No State Status	2003	0.0-0.5
Sandhill Crane[3]	*Grus Canadensis*	Vertebrate	No State Status	2001	0.5-1.0
Bald Eagle	*Haliaeetus leucocephalus*	Vertebrate	SC	2005	0.5-1.0
Colonial Waterbird Nesting Area	Not Applicable	Animal Assemblage	Not Applicable	1986	0.5-1.0
Native Plant Community, Undet. Class	Not Applicable	Community	Not Applicable	1995	0.5-1.0
Native Plant Community, Undet. Class	NA Not Applicable	Community	Not Applicable	1995	0.0-0.5

1: SC = State-listed Special Concern (Minnesota DNR 2007)

2: American Bittern does not have state conservation status; however, it is listed in Minnesota's Wildlife Action Plan Set of Species in Greatest Conservation Need. American Bittern is "high priority in all Bird Conservation Regions of Shorebird Plans" (Minnesota DNR 2006).

3: Sandhill Crane is protected under the Migratory Bird Treaty Act, as are all migratory birds. This species does not have state conservation status. This species may be tracked in this database due to their close resemblance to the federally endangered Whooping Crane.

Mitigative Measures

The Project and construction process will be designed to avoid encroachment and effects on rare species and unique natural resources to the extent practicable. If rare species or unique natural resources will be affected, Xcel Energy will coordinate with the MnDNR and consider modifying either the construction footprint or the construction practices to minimize impacts. A field survey was completed in November of 2010 to evaluate if the recorded Bald Eagle nesting site is currently occupied. This survey revealed that the nesting site near Rice Lake is no longer present, and no evidence of nests was observed along the balance of the Project route. In the event that an eagle nest is later located and determined to be occupied, efforts will be made to minimize potential impacts from construction activities which may include alteration of pole locations or scheduling construction to avoid nesting season.

7.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS

7.1 AGENCY CONTACTS

Xcel Energy sent letters to various regulatory and governmental authorities to request review of the Project Area for applicable comments and concerns. See Appendix D.1. Xcel Energy also sent letters to local governmental units ("LGUs") within the Project Area giving LGUs notice of the Project, requesting comments, and allowing LGUs the opportunity to request a meeting to discuss the Project. See Appendix D.2.

7.1.1 United States Fish and Wildlife Service ("USFWS")

Xcel Energy sent a letter to the USFWS on November 12, 2009, requesting a review of the Project Area for federally listed threatened and endangered species. As of time of this application submittal there has been no written response provided by the USFWS.

7.1.2 Minnesota Department of Natural Resources ("MnDNR")

Xcel Energy sent letters to the MnDNR Natural Heritage and Nongame Research Program on October 2, 2009, requesting a review of the Project Area for state threatened and endangered species and rare natural features. In the MnDNR's response dated October 28, 2009, the MnDNR identified certain rare species and features that might be affected by the proposed Project. Those species and features are addressed in Section 6.6 of this Application. See Appendix D.4 for the comments from the MnDNR.

In a letter dated December 11, 2009, Randall Doneen, Environmental Review Planning Director for the Minnesota Department of Natural Resources, provided comments regarding the proposed project. These comments generally discussed line positioning, line construction, and evaluation of local wildlife resources. Specifically, comments were offered on the following issues:

- Locating the new transmission line (*Segment 3*) along the northwest side of Highway 5 near Braunworth Lake, and moving a lower voltage distribution line from the southeast side of this highway to be co-located with the new line. Additionally, this line should be marked with bird diverters.
- There are two sets of utility lines paralleling Highway 5 near Hydes Lake (*junction of Segment 4 and 5*) Combining these lines is preferred to allow a greater setback from Hydes Lake or the recovery of previously fragmented forest area.
- A bald eagle nest was identified near the project area in 2005. Coordination with the USFWS is encouraged.

- Bird diverters are recommended for transmission line segments near Hydes Lake and Winkler lake to reduce the possibility of bird collisions.

To address these comments, several actions have been undertaken during project planning. The use of bird diverters has been incorporated into the project near water bodies. Comment was requested from the USFWS, and a raptor nest survey was undertaken along the entire route to verify the presence or absence of such nests, including Bald Eagles, with none observed. Line positioning will be optimized to reduce impacts to wildlife as possible. Segment 3 is proposed to be located on the northwest side of Highway 5. Combining regional distribution lines in this area, however, is not practical or cost effective for this project. Additional consideration will be given to these options during final design.

7.1.3 Minnesota Department of Transportation ("MnDOT")

Xcel Energy sent a letter to the Minnesota Department of Transportation ("MnDOT") on November 12, 2009, requesting comments on the proposed Project. On December 10, 2009, Xcel Energy received comments from MnDOT related to the proposed Project (See Appendix D.5). Stacy Kotch, Utility Transmission Route Coordinator, did not comment regarding MnDOT permits that may be required for work within MnDOT right-of-ways. As discussed in Section 6.2.10, utility work within MnDOT right of ways should be designed based on that agency's Accommodation Policy.

MnDOT right-of-ways within the Project Area vary in width from 46 to 74 feet along the proposed route. Generally, if Xcel Energy is working in an area greater than 100 feet from the centerline of the roadways, no MnDOT permit will be required. Xcel Energy will work with MnDOT and determine which areas of the Project will require a MnDOT permit as the Project moves forward.

7.1.4 Army Corps of Engineers ("USACE")

Xcel Energy sent a letter to the Corps of Engineers ("USACE") on November 12, 2009, requesting comments on the proposed Project. On November 23, 2009, Xcel Energy received comments from USACE related to the proposed Project (See Appendix D.6). Tamara Cameron, Regulatory Branch Chief of the St. Paul District, did not provide specific comment on the Project, but did offer several issues to consider regarding the need for USACE permits for impacts to navigable waters of the United States, dredge or fill of navigable waters, and compliance with NEPA. The Project design is not anticipated to involve such impacts, with the exception of potential wetland impacts, that may be within USACE jurisdiction as navigable waters of the United States. Any applicable permits needed

for wetland impacts will be processed through the USACE as well as the local governmental unit.

7.1.5 Carver and McLeod Counties, Townships and Cities

On November 12, 2009 Xcel Energy sent letters to representatives of Carver and McLeod counties, the townships of Benton, Dahlgren, Helen, Waconia and Young America, and the cities of Cologne, Glencoe, Norwood Young America, and Plato requesting comments on the proposed Project. On October 13, 2009, Xcel Energy met with representatives from Carver and McLeod counties to introduce the Project. The county staffs were generally in favor of the need for the Project, requested to be updated on further Project developments and informed of any scope changes. Xcel Energy will continue working with local governments on the Project.

7.2 IDENTIFICATION OF LANDOWNERS

A list of the landowners within and adjacent to the proposed rebuild and new line route is included in Appendix E.1. Addresses have been redacted from the landowner list and comment forms due to privacy concerns.

7.3 PUBLIC PARTICIPATION

Xcel Energy held a public informational meeting in Norwood Young America on February 8, 2010, prior to developing this Application. This meeting was held to inform landowners and public officials of the proposed Project and solicit input to be used in route selection. A notice for the public informational meeting was published in the Glencoe McLeod County Chronicle, Norwood Young America Times, and Waconia Patriot newspapers, on February 3, 2010. A copy of the notice is included in Appendix E.2.

Approximately 27 people attended the informational meeting. A copy of the attendance form is included in Appendix E.3.

Generally, public interest focused primarily on the location of the new segment of transmission line near the West Waconia Substation and the structure design details of the transmission line rebuild segments. No written comments have been received from the public, however, Xcel Energy will continue to work with the public throughout the routing process.

7.4 REQUIRED PERMITS AND APPROVALS

Federal, state, and local permits that could potentially be required for the Project are identified below in Table 15.

TABLE 15
POTENTIAL REQUIRED PERMITS

Permit	Jurisdiction
Clean Waters Act Section 404 Permit	USACE
Certificate of Need	MnPUC
Route Permit	MnPUC
Public Waters	MnDNR
Utility Permit	MnDOT
Construction Stormwater Permit	MPCA
Minnesota Wetland Conservation Act Certification	Carver and McLeod Counties
County Road Access Permit	Carver and McLeod Counties

7.4.1 Federal Permits

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers ("USACE") administers the regulatory programs of the federal Clean Water Act and the Rivers and Harbors Act. The USACE may require authorization of the Project under the utility line discharge provision of a Regional General Permit (RGP-3-MN).

7.4.2 State of Minnesota Permits

Minnesota Public Utilities Commission

Minnesota Statutes Section 216E.03, subd. 2. provides that no person may construct a high-voltage transmission line without a route permit from the Commission.

Minnesota Department of Natural Resources

The MnDNR Division of Lands and Minerals regulates utility crossings on, over or under any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minnesota Statutes Section 84.415 and Minnesota Rules Chapter 6135. Xcel Energy works closely with the MnDNR on these permits and will file for them once the line design is complete. The MnDNR Division of Waters requires a Public Waters Work Permit for any alteration of the course, current, or cross-section below the ordinary high water level of a Public Water or Watercourse. No such alterations are anticipated.

Minnesota Department of Transportation

MnDOT requires the Application for Utility Permit on County Highways Right-of-Way form for the vast majority of utility placements and relocations. Utility owners use this form to request permission to place, construct, and reconstruct utilities within trunk highway right-of-way, whether longitudinal, oblique, or perpendicular to the centerline of the highway. Xcel Energy will determine if such permit is required, and, if so, obtain the permit from the MnDOT.

Minnesota Pollution Control Agency

MPCA requires an NPDES construction storm water permit and Stormwater Pollution Prevention Plan ("SWPPP") if you are the owner or operator for any construction activity disturbing: 1) one acre or more of soil; 2) less than one acre of soil if that activity is part of a "larger common plan of development or sale" that is greater than one acre; or 3) less than one acre of soil, but the MPCA determines that the activity poses a risk to water resources. Most construction activities are covered by the general NPDES storm water permit for construction activity, but some construction sites need individual permit coverage. Xcel Energy will determine if such a permit is required, and, if so, obtain the permit from the MPCA.

7.4.3 Local Permits

Once the Commission issues a route permit, zoning, building and land use regulations and rules are preempted under Minnesota Statutes Section 216E.10, subd. 1.

Carver and McLeod Counties

Carver and McLeod counties locally administer the Minnesota Wetland Conservation Act ("WCA"). It is likely that wetland impact minimization will allow the Project to be eligible for a WCA de minimis or utilities exemption. If that is not the case, WCA certification of wetland replacement could be required. Carver and McLeod counties may also require a county road access permit.

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9.0 DEFINITIONS

Avian	Of or relating to birds.
Breaker	Device for opening a circuit.
Bus	An electrical conductor that serves as a common connection for two or more electrical circuits; may be in the form of rigid bars or stranded conductors or cables.
Conductor	A material or object that permits an electric current to flow easily.
Corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding conductors.
Disconnects	A power switch that can be shut off and then locked in the "off" position.
Electric (E) Field	The field of force that is produced as a result of a voltage charge on a conductor or antenna.
Electromagnetic	The term describing the relationship between electricity and magnetism; a quality that combines both magnetic and electric properties.
Electromagnetic Field	The combination of an electric (E) field and a magnetic (H) field.
Electromotive Force ("EMF")	The force (voltage) that produces an electric current in a circuit.
Excavation	A cavity formed by cutting, digging, or scooping.
Fauna	The collective animals of any place or time that live in mutual association.
Flora	The collective plants of any place or time that live in mutual association.
Grading	To level off to a smooth horizontal or sloping surface.
Grounding	To connect electrically with a ground; to connect some point of an electrical circuit or some item of electrical equipment to earth or to the conducting medium used in lieu thereof.
Habitat	The place or environment where a plant or animal naturally or normally lives and grows.

High Voltage Transmission Lines ("HVTL")	Overhead and underground conducting lines of either copper or aluminum used to transmit electric power over relatively long distances, usually from a central generating station to main substations. They are also used for electric power transmission from one central station to another for load sharing. High voltage transmission lines typically have a voltage of 115 kV or more.
Hydrocarbons	Compounds that contain carbon and hydrogen, found in fossil fuels.
Ionization	Removal of an electron from an atom or molecule. The process of producing ions. The electrically charged particles produced by high-energy radiation, such as light or ultraviolet rays, or by the collision of particles during thermal agitation.
Magnetic (H) Field	The region in which the magnetic forces created by a permanent magnet or by a current-carrying conductor or coil can be detected. The field that is produced when current flows through a conductor or antenna.
Mitigate	To lessen the severity of or alleviate the effects of.
Oxide	A compound of oxygen with one other more positive element or radical.
Ozone	A very reactive form of oxygen that combines readily with other elements and compounds in the atmosphere.
Raptor	A member of the order Falconiformes, which contains the diurnal birds of prey, such as the hawks, harriers, eagles and falcons.
Sediment	Material deposited by water, wind, or glaciers.
Stray Voltage	A condition that can occur on the electric service entrances to structures from distribution lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines 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.

Substation	A substation is a high voltage electric system facility. It is used to switch generators, equipment, and circuits or lines in and out of a system. It also is used to change AC voltages from one level to another. Some substations are small with little more than a transformer and associated switches. Others are very large with several transformers and dozens of switches and other equipment.
Voltage	A unit of electrical pressure, electric potential or potential difference expressed in volts. The term used to signify electrical pressure. Voltage is a force that causes current to flow through an electrical conductor. The voltage of a circuit is the greatest effective difference of potential between any two conductors of the circuit.
Voltage Drop	The difference in voltage between two points; it is the result of the loss of electrical pressure as a current flows through a resistance.
Waterfowl	A bird that frequents water; especially a swimming game bird (as a duck or goose) as distinguished from an upland game bird or shorebird.
Waterfowl Production Area ("WPA")	Waterfowl Production Areas preserve wetlands and grasslands critical to waterfowl and other wildlife. These public lands, managed by the U.S. Fish and Wildlife Service, were included in the National Wildlife Refuge System in 1966 through the National Wildlife Refuge Administration Act.
Wetland	Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs and similar areas.
Wildlife Management Area ("WMA")	Wildlife Management Areas are part of Minnesota's outdoor recreation system and are established to protect those lands and waters that have a high potential for wildlife production, public hunting, trapping, fishing, and other compatible recreational uses.