minnesota power
AN ALLETE COMPANY

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October 9, 2013

Dr. Burl W Haar
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101

Re: Application for a Route Permit By Minnesota Power
Canisteo Transmission Project
MPUC Docket No. E015/TL-13-805

Dear Dr. Haar:

Please find Minnesota Power's ("Applicant") Route Permit Application ("Application") for two parallel 5 mile 115 kV high voltage transmission lines ("HVTLs") and associated substation located north of the city of Bovey, MN ("Canisteo Project"). The Application details the proposed location of the Canisteo Project, located in Itasca County.

The Route Permit Application is submitted under the Alternative Permitting Process of Minn. Rules 7850.2800 to 7850.3900 and Minn. Stat. 216E.04. An electronic copy on CD ROM and 20 paper copies of the Application have been provided to Bill Storm of the Department of Commerce, Energy Facility Permitting staff.

Minnesota Power awaits an invoice from Department of Commerce for processing the route permit application (as required by Minn. Rules 7850.1800 and Minn. Stat. 216E.18).

Please direct any questions you may have with respect to the filing to Daniel McCourtney of Minnesota Power at 218-355-3515

Thank you for your attention to this project.

Yours truly,

David R. Moeller

c: Deborah Pile, DOC-EFP

MINNESOTA POWER

APPLICATION TO THE MINNESOTA PUBLIC UTILITIES COMMISSION FOR A ROUTE PERMIT

CANISTEO HVTL PROJECT

115 KV TRANSMISSION LINE AND SUBSTATION

Alternative Permitting Process
PUC Docket No. E015/TL-13-805

October 9, 2013

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1.0 Executive Summary

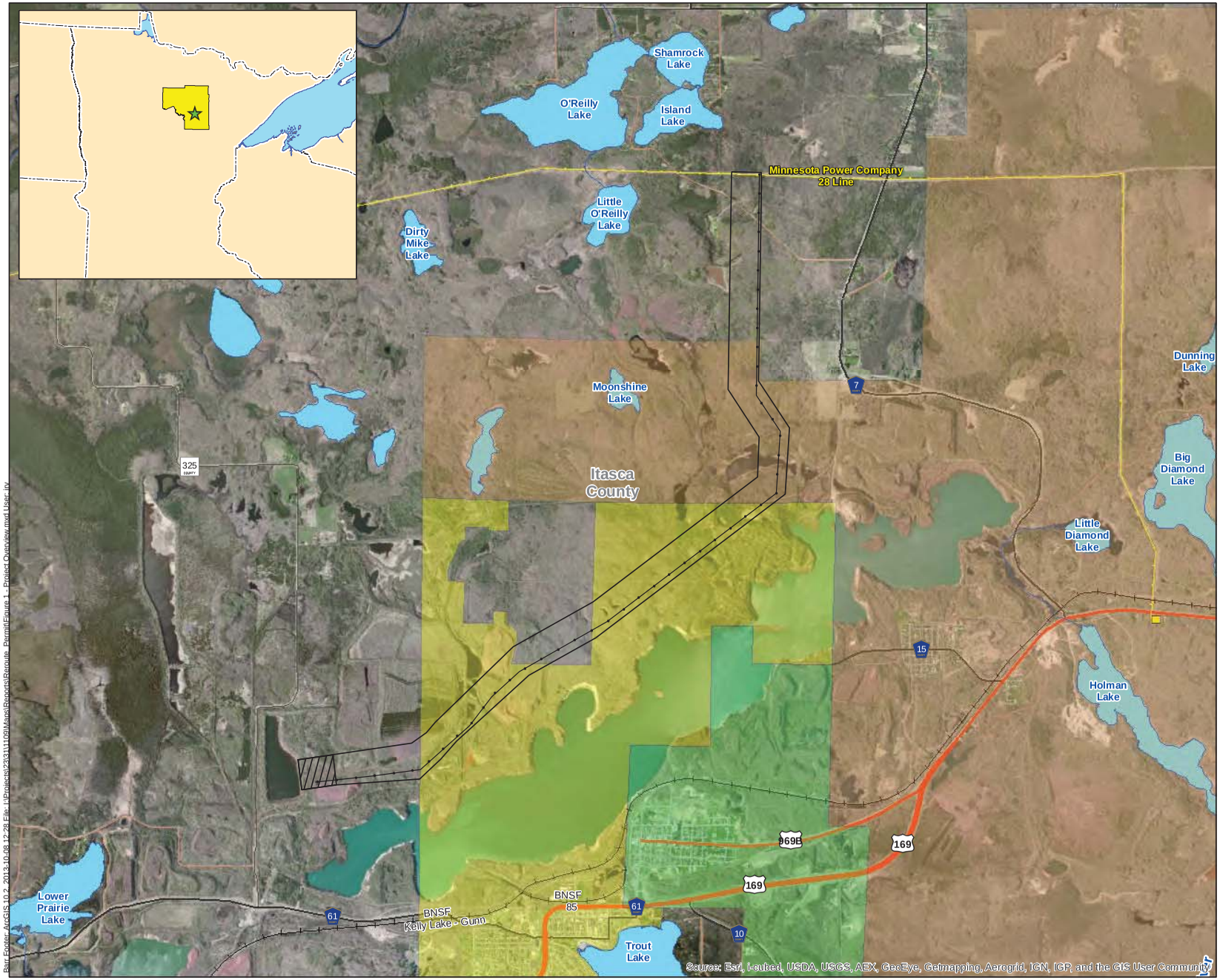
1.1 Proposal Summary

Minnesota Power, a division of ALLETE, Inc., (Minnesota Power or the Applicant) submits this application (Application) for a Route Permit to the Minnesota Public Utilities Commission (MPUC or Commission) pursuant to Minnesota Statutes Chapter (Minn. Stat.) 216E and Minnesota Rules (Minn. R.), chapter 7850. A Route Permit is requested to build two parallel, approximately five-mile 115 kilovolt (kV) high voltage transmission lines (HVTLs) and a new substation called the Canisteo Substation, collectively referred to as the Project.

The proposed Project is located north of the cities of Coleraine and Bovey, Minnesota. The proposed HVTLs would connect to Minnesota Power's existing 28 Line west of Scenic Highway 7, traverse south across Reilly Beach Road to the Canisteo Pit, and then turn southwest where it would terminate at the proposed Canisteo Substation Location.

The proposed Project is needed to provide power to a proposed Magnetation mining project. The $120 million dollar project is expected to create 160 new jobs in the Grand Rapids area. Timely approval of this Route Permit would ensure the project's success and the full realization of its economic potential for the area. The proposed Project would require a 160-foot right-of-way (ROW). The Applicant is requesting a 1,000-foot route width to allow adequate flexibility in developing a final alignment for the proposed new 115 kV HVTL.

Detailed maps showing resources and environmental features along the proposed routes and near the proposed Substation are provided in Appendix B. (Due to shared ownership in the area, the yellow text indicating parcels is extensive for some areas.)



Proposed Alignment
Proposed Route
Proposed Substation Area
PWI Basin
PWI Watercourse
Existing Transmission Line
Existing Substation

Municipal Boundary

Bovey
Coleraine
Taconite

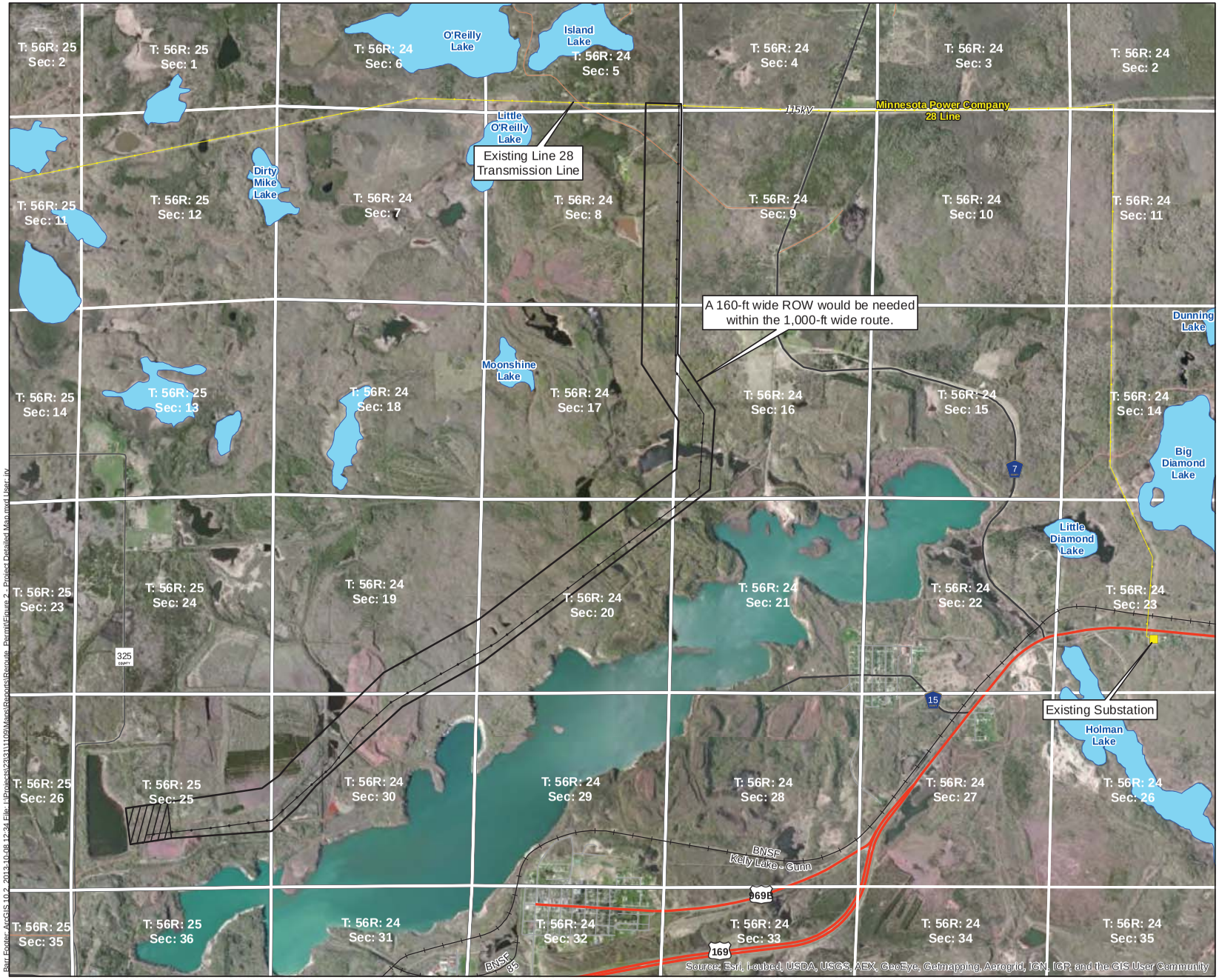
N

Feet
0 3,000 6,000

BARR

Figure 1

PROJECT OVERVIEW
Proposed Canisteo 115 kV
HVTL and Substation
Minnesota Power
Itasca County, MN



N

Feet
0 2,500 5,000

BARR

Figure 2

PROJECT DETAILED MAP
Proposed Canisteo 115 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

This Application is submitted pursuant to the Alternative Permitting Process outlined in Minn. R., parts 7850.2800 to 7850.3900. The proposed 115 kV HVTL and associated facilities are eligible for consideration under the Alternative Permitting Process under Minn. Stat. § 216E.04, subd. 2(3), and Minn. R., parts 7850.2800 to 7850.3900 (*see* Minn. R., part 7850.2800, subpart 1(C)) because the proposed Project is between 100 and 200 kV. The Applicant respectfully requests that the Commission approve the proposed Routes and proposed Substation Location, and authorize a route width of 1,000 feet for the 115 kV HVTL. (Figure 2 and Appendix B)

1.2 Completeness Checklist

The content requirements for an application with the Commission under the Alternative Permitting Process are identified under Minn. Stat. § 216E.04, subd. 2(3) and Minnesota Rules, parts 7850.1900, 7850.1700, and 7850.3100. 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	Route Permit Application Section
Minn. R., part 7850.2800, subparts 1(C) and (D)	**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: (C) for HVTLs of between 100 and 200 kV;	2.5
Minn. R., part 7850.2800, subpart 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.	2.6 and **Appendix A**
Minn. R., part 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

Authority	Required Information	Route Permit Application Section
Minn. R., part 7850.1900, subpart 2 (applicable per Minn. R., part7850.3100)	**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 Route Permit may be transferred if transfer of the Route Permit is contemplated.	2.3
C.	At least two proposed routes for the proposed HVTLs and identification of the preferred route and the reasons for the preference.	Not applicable, per Minn. R., part 7850.3100 However, *see* 4.3.
D.	A description of the proposed HVTL and all associated facilities including the size and type of the HVTL.	3.2, 4.1, 4.4, **5.1.1**
E.	The environmental information required under part 7850.1900, subpart 3	Section 6.0 see Minn. R., part 7850.1900, subpart 3 (A) - (H)
F.	Identification of land uses and environmental conditions along the proposed routes.	Section **6.0**
G.	The names of each owner whose property is within any of the proposed routes for the HVTL.	**Appendix C**
H.	United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the HVTL on all proposed routes.	**Appendix B**
I.	Identification of existing utility and public ROWs along or parallel to the proposed routes that have the potential to share ROW, the land used by a public utility (as for a transmission line), with the proposed line.	4.2.2, **5.1.3**
J.	The engineering and operational design concepts for the proposed HVTL, including information on the electric and magnetic fields of the transmission line.	Section **5.0**
K.	Cost analysis of each route, including the costs of constructing, operating, and maintaining the HVTL that are dependent on design and route.	3.5, **5.1.7**
L.	A description of possible design options to accommodate expansion of the HVTL in the future.	4.4
M.	The procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the HVTL.	**5.1.3**-0
N.	A listing and brief description of federal, state, and local permits that may be required for the proposed HVTL.	**Error! Reference source not found.**

Authority	Required Information	Route Permit Application Section
Minn. R., part 7850.1900, subpart 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 resources.	**6.4**
E.	A description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna.	**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.	Section **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 mitigation measures.	Section **6.0**

2.0 Introduction

2.1 Statement of Ownership

The proposed 115 kV HVTLs and associated facilities would be constructed, owned and operated by Minnesota Power. Minnesota Power, a division of ALLETE Inc., is an investor-owned utility headquartered in Duluth, Minnesota. The Company provides electricity in a 26,000-square-mile electric service territory located in northeastern Minnesota. Minnesota Power supplies retail electric service to 141,000 customers in northern Minnesota, and wholesale electric service to 16 municipalities in Minnesota. The proposed Project would be located in Minnesota Power's service area and would connect to Minnesota Power's existing transmission facilities. Minnesota Power's transmission network is interconnected with the regional transmission grid to promote reliability and Minnesota Power is a member of the Midwest Reliability Organization and the Midcontinent Independent System Operator (MISO).

2.2 Requested Action

This Application is submitted under the Alternative Permitting Process under Minn. Stat. § 216E.04, subd. 2(3) and Minn. R., parts 7850.2800 to 7850.3900 (*see* Minn. R., part 7850.2800, subpart 1(C)). While the rules do not require consideration of alternate routes in the Application (*see* Minn. R., part 7850.3100), the Applicant's evaluation of alternatives during the development of the proposed Route and proposed Substation Location is contained in this Application (Section 4.3).

For reasons identified in subsequent sections of this application, the Applicant believes the proposed Route for constructing the proposed 115 kV HTVLs and the proposed Substation Location for construction of the new Canisteo Substation represent the best alternative (Figure 2). The Applicant respectfully requests that the Commission approve the proposed Route and Substation Location, and authorize a route width of 1,000 feet for the two parallel 115 kV HVTLs (Appendix B).

This Application demonstrates that construction of the proposed Project along the Proposed Route and proposed Substation Location would comply with the applicable standards and criteria set out in Minn. Stat. § 216E.03, subd. 7 and Minn. R., part 7850.4100. The proposed Project would support the State's goals to conserve resources, minimize environmental and human settlement impacts and land use conflicts, and ensure the State's electric energy security through the construction of efficient, cost-effective infrastructure.

2.3 Permittee

The permittee for the proposed Project is:

Permittee:	Minnesota Power
Contact:	Daniel McCourtney Siting and Permitting Analyst
Address:	Minnesota Power 30 West Superior Street Duluth, MN 55802
Phone:	(218) 355-3515
E-mail:	dmccourtney@ALLETE.com

2.4 Certificate of Need

Minn. Stat. § 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 by the Commission. The proposed Project does not meet the definition of a "large energy facility" under Minn. Stat. § 216B.2421. While the proposed Project is a HVTL with a capacity of 100 kV or more, it is not more than 10 miles long in Minnesota and it does not cross a state line (Minn. Stat. § 216B.2421 subd. 2(3)). Therefore, a Certificate of Need is not required for the proposed Project.

2.5 Route Permit, Alternative Permitting Process

The Minnesota Power Plant Siting Act (PPSA) states that no person may construct an HVTL without a Route Permit from the Commission (Minn. Stat. § 216E.03, subd. 2). Under the PPSA, an HVTL is considered to be a transmission line that is 100 kV or more and is greater than 1,500 feet in length (Minn. Stat. § 216E.01, subd. 4). The proposed Project is capable of operating at more than 100 kV and is greater than 1,500 feet in length. A Route Permit is required from the Commission prior to construction. The proposed Project qualifies for review under the Alternative Permitting Process authorized by Minn. Stat. § 216E.04, subd. 2(3) and Minn. R., part 7850.2800, subpart 1(C). Accordingly, the Applicant is following the provisions of the Alternative Permitting Process outlined in Minn. R., parts 7850.2800 to 7850.3900 for this proposed Project.

2.6 Notice to the Commission

The Applicant notified the Commission on September 6, 2013, by letter sent via the U.S. Postal Service and e-filed that the Applicant intends to use the Alternative Permitting Process for the proposed Project. This letter complies with the requirement of Minn. R., part 7850.2800, subpart 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.

3.0 Proposed Project Information

3.1 Proposed Project Location

The proposed Project is located in Itasca County, Minnesota, near the cities of Coleraine and Bovey. Figure 1 shows an overview of the Project area. The proposed Route and the proposed Substation Location are shown in Figure 2. Detailed overview maps of the Project area are included in Appendix B. Table 2 identifies the detailed location information for the proposed Project.

Table 2 Detailed Project Location

Township	Range	Section	County
56N	24W	5	Itasca
56N	24W	8	Itasca
56N	24W	16	Itasca
56N	24W	17	Itasca
56N	24W	19	Itasca
56N	24W	20	Itasca
56N	24W	21	Itasca
56N	24W	30	Itasca
56N	25W	25	Itasca

3.2 Project Proposal

As shown in Figure 2, the Applicant is proposing to build two, approximately five-mile, 115 kV HVTLs and a substation near Coleraine, Minnesota. The key components of the proposed Project include:

- The proposed HVTLs would connect to Minnesota Power's existing 28 Line west of Scenic Highway 7, traverse south across Reilly Beach Road to the Canisteo Pit, and then turn southwest where they would terminate at the proposed Canisteo Substation.

- The new Canisteo Substation would be constructed north of County Highway 61 and east of County Road 325 near the western edge of the Canisteo Pit.

Additional detail regarding each of these components is provided in Section 4.0.

3.3 Need for Project

Minnesota Power is extending transmission lines to the proposed Magnetation plant to meet its power needs and support their mining and mineral processing plans. The Magnetation plant will be designed to produce iron ore concentrate by recovering weakly magnetic iron oxide particles from low-grade natural ore tailings basins, already-mined iron formation stockpiles, and newly-mined iron formation. Magnetation's initial focus is on exploitation of the hematite and magnetite contained in natural ore

waste tailings basins created over the last 100 years of mining operations on the Mesabi Iron Range of Minnesota. Since the late 1800s, iron mines in the Iron Range of northern Minnesota have been discarding fine, particle-sized minerals that are a waste product of mining operations. These tailings were pumped in a water-slurry form into impoundment dikes that formed tailings basins covering large areas. These waste tailings basins represent ore bodies to Magnetation. Magnetation's project is a significant economic development opportunity for the area. In order to optimize this opportunity and unlock its economic development potential, Minnesota Power requests that the approval process for this Project be timely.

3.4 Project Schedule

Construction of the proposed Project is expected to begin in the fourth quarter of 2014, and the Applicant anticipates a first quarter 2015 in-service date for the proposed facilities. Table 3 provides an estimated permitting and construction schedule summary for the proposed Project. 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.

Table 3 Estimated Project Schedule

Project Task	Date
File Route Permit Application (Application) with the Commission	4th Quarter 2013
Route Permit Review Process Complete	2nd Quarter 2014
ROW Acquisition	3rd Quarter 2014
Begin Transmission Line and Substation Construction	4th Quarter 2014
In-Service Date	1st Quarter 2015

3.5 Project Costs

The Applicant estimates that the proposed Project would cost approximately $ 6,250,000 to construct. Final cost for the Project is dependent on final route selection, necessary mitigation, and final construction procedures. A more detailed breakdown of the estimated proposed Project cost is shown in Table 4.

Table 4 Estimated Project Cost

Project Item	Cost
115 kV Transmission Line Facilities	$ 2,500,000
Canisteo Substation	$ 3,750,000
Total Project Cost	$ 6,250,000

Maintenance costs after construction would be nominal for several years, since the proposed transmission line would be new and there would be minimal initial vegetation management required. Typical annual operating and maintenance costs for 115 kV transmission lines across Minnesota Power's Upper Midwest system area are on the order of $400 to $600 per mile of transmission ROW. The principal operating and maintenance costs include inspections of the transmission ROW, which are usually conducted using fixed-wing aircraft and helicopter on a regular basis.

Minnesota Power 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 proposed Project involves building two parallel, approximately five-mile 115kV HVTLs as well as constructing a new substation. The proposed HVTLs would connect to Minnesota Power's existing 28 Line west of Scenic Highway, traverse south across Reilly Beach Road to the Canisteo Pit, and then turn southwest where it would terminate at the proposed Canisteo Substation Location.

4.2 Route Width and Alignment Selection Process

4.2.1 Route Width

The PPSA directs the Commission to locate transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring their electric needs are met and fulfilled in an orderly and timely fashion" (Minn. Stat. § 216E.02, subd. 1). The PPSA also authorizes the Commission to meet its routing responsibility by designating a "route" for a new transmission line when it issues a Route Permit. The route may have "a variable width of up to 1.25 miles" within which the ROW for the facilities can be located (Minn. Stat. § 216E.01, subd. 8).

The proposed Route width is 1,000-feet and the ROW required would be 160-feet. Due to the engineering challenges associated with the proposed Project, including topography and wetland avoidance and crossings, the Applicant is requesting a 1,000-feet route width to allow adequate flexibility in developing a final alignment for the line.

4.2.2 Route Selection Process

The Applicant developed the proposed Routes with consideration of the statutory and rule criteria set forth in the PPSA and Minn. R., part 7850.4100 as well as to the State of Minnesota's practice of non-proliferation of new infrastructure routes. The proposed Substation Location is in a remote area with proposed mining activity planned to the north and west. The Canisteo Mine Pit and iron formation is located to the south of the proposed Substation Location. As a result, accessing the site from the east was the only feasible Route. The proposed route as shown in Figure 1 represents the route with the least potential impacts on private residences and private, non-corporate, landowners. The Applicant also solicited input from interested stakeholders and landowners, including local, state, and federal agencies. In addition, the Applicant assessed existing utility and public ROWs to identify opportunities for ROW sharing and constraints for alignment and pole placement. Figure 2 shows existing electric transmission line infrastructure in the Project area.

Early in the planning process, the Applicant assessed the general area surrounding the proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the proposed Project. A team of siting, ROW, planning, environmental, ecological, and

engineering personnel worked together to develop proposed Routes that minimize overall impacts of the proposed Project while still fulfilling the Project purpose.

4.3 Alternate Route Segments Considered and Rejected

A route as defined under Minn. Stat. § 216E.01, subd. 8 and Minnesota Rules, part 7850.1000, subpart 16 is the location of a HVTL between two end points. The route may have a variable width of up to 1.25 miles. For this proposed Project, the Applicant is requesting a 1,000-foot route width for two parallel 115 kV HVTLs. The range of potential routes considered by the Applicant for the proposed Project was constrained by a need to connect to Magnetation's planned plant site and avoiding proposed mining activities around the proposed project area.

A route originating from Minnesota Power's existing Diamond Lake Tap (two miles east of the proposed project) was considered, however, that option proposed a number of electrical, environmental and social impacts. See Figure B.6.

One of the benefits of the proposed project would be to segment Minnesota Powers 28 Line which already has three taps. With the expected new load at the Canisteo Substation and the existing taps already on 28 Line, isolation equipment is necessary to limit the amount of load at risk from a single line outage. Simply tapping the existing Diamond Lake Tap was not a viable option. As a result, the Canisteo Project has been designed with isolation equipment and looped transmission services (the proposed two parallel 115 kV transmission lines). The proposed Project would limit the amount of load at risk from a single line outage. To accommodate the proposed Project, the Diamond Lake Tap would need to be reconfigured and rebuilt. Significant outages on 28 line would be necessary to make these reconfigurations happen. This would affect the 3 existing taps that serve the Cohasset, Taconite and Nashwauk areas. It would also require an outage at Magnetation's Plant 2

In addition to electrical impacts, connecting to the Diamond Lake Tap would increase the length of new construction from 5 miles to 6 miles and require a rebuild of an additional 1.5 miles of existing transmission line. This added distance would increase the environmental impacts that would result from the proposed project. Also, a proposed transmission line route that originated from the Diamond Lake Tap would need stay north of the Iron formation which would site the two 1115 kV transmission lines through land that is already under option for the Excelsior biomass project located in Itasca County.

For all of the reasons stated above, Minnesota Power decided against tapping or rebuilding the diamond Lake Tap

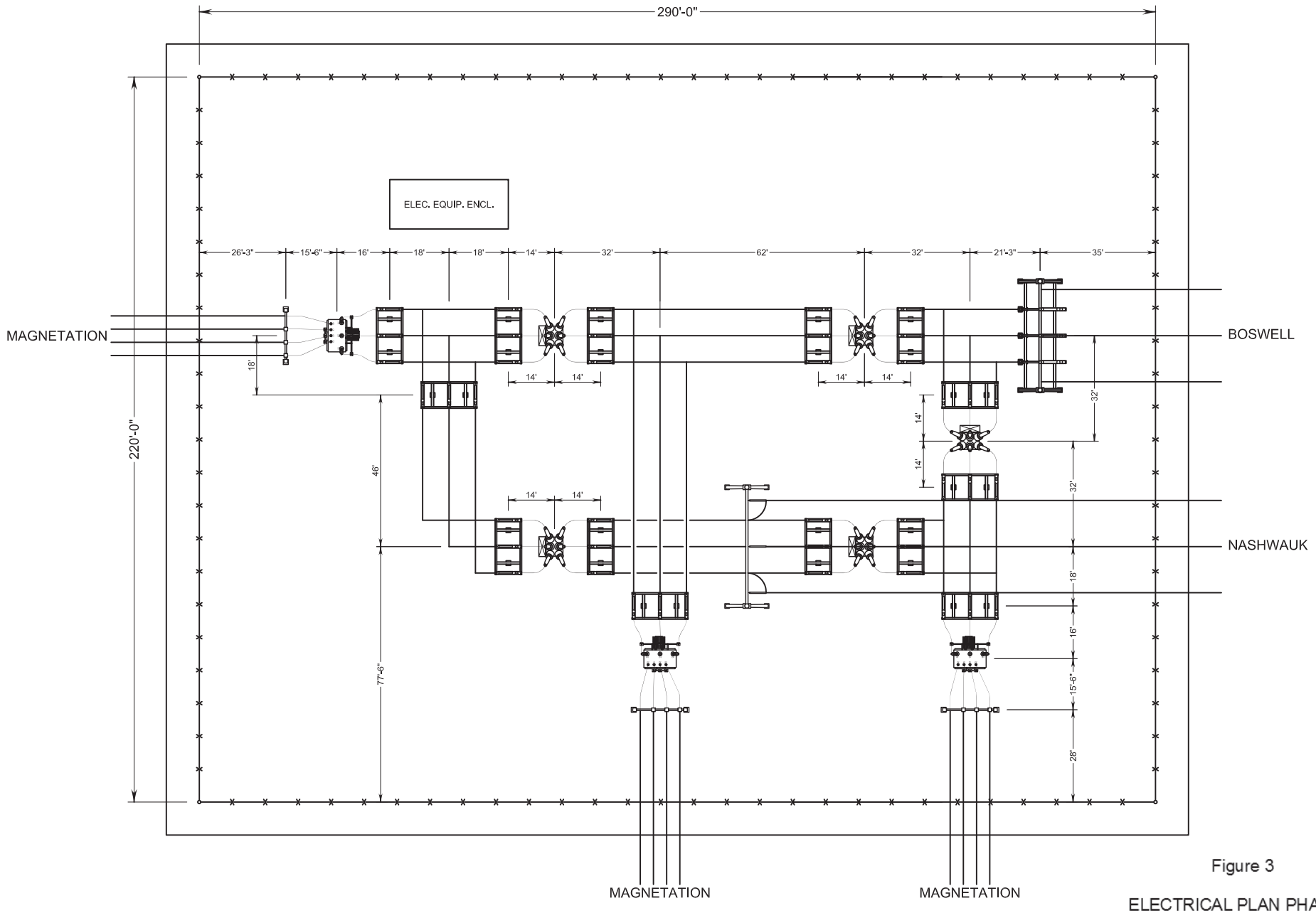
4.4 Associated Facilities and Substation Modifications

The new Canisteo Substation would consist of two 115/4.16 kV transformers and one 115/13.8 kV transformer along with associated equipment including, circuit breakers, air break switched, instrument

transformers, surge arrestors, and , control house. The estimated dimensions for the new Canisteo Substation, subject to final design, are 290 feet by 220 feet. Figure 3 shows the proposed substation dimensions and preliminary layout.

4.5 Design Options to Accommodate Future Expansion

The proposed facilities are designed with enough capacity to meet current and future needs in the Project area for at least 20 years, barring any unforeseen significant load growth.



CANISTEO 115 / 13.8 / 4.16kV SUB. - PHASE 1

Figure 3

ELECTRICAL PLAN PHASE 1
Proposed Canisteo 115 kV
HVTL and Substation
Minnesota Power
Itasca County, MN

5.0 Engineering Design, Construction and ROW Acquisition

5.1 Structures, ROW, Construction and Maintenance

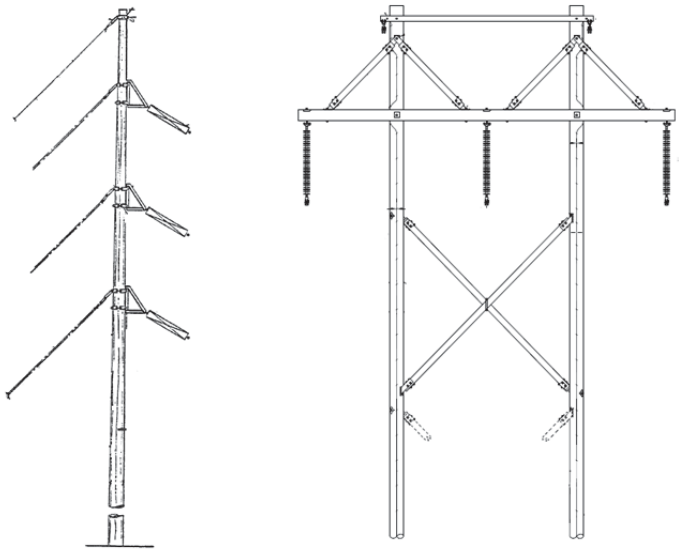
5.1.1 Transmission Structures

The proposed Project would use H-Frame and Monopole Angle structure types as appropriate. The specifications of these structures are included in Table 5 and presented in Figure 4.

Table 5 Structure Design Summary

Line Type	Structure Type	Structure Material	Typical ROW Width (feet)	Approximate Structure Height (feet)	Structure Base Diameter (inches)	Foundation Diameter (feet)	Span Between Structures (feet)
Single Circuit 115 kV	H-Frame	Wood or Steel	100	Ranges from 60-75ft	Ranges from 16-62”	Wood: direct embed Steel: 6-8ft	600ft +/-100ft
Single Circuit 115 kV	Monopole Angle	Wood or Steel	100	Ranges from 60-110ft	Ranges from 18-72”	Wood: direct embed Steel: 6-8ft	300ft +/-100ft

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



Typical Monopole Angle Structure	Typical H-Frame Structure

Figure 4 Typical 115 kV Structures

5.1.2 Right-of-Way Width

The proposed new 115 kV HVTLs would require a total 160-foot ROW. When the transmission line is placed cross-country across private land, an easement for the entire ROW would be acquired from the affected landowner(s). Minnesota Power would locate the poles as close to property division lines as reasonably possible.

5.1.3 Right-of-Way Evaluation and Acquisition

The proposed Project would require approximately five miles of new ROW for the proposed 115kV transmission lines. The proposed Substation would be located adjacent to the Magnetation processing plant. Acquisition of property required for the substation would be determined once the processing plant's location is determined. Minnesota Power would purchase the property required for the substation.

For transmission lines, utilities typically acquire easement rights across the parcels to accommodate the facilities, including transmission lines and structures. The ROW acquisition process begins early in the detailed design process. The evaluation and acquisition process includes examining titles, contacting owners, surveying, preparing documents and purchasing the ROW. Each of these activities, particularly as it applies to easements for transmission line facilities, is described in more detail below.

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

The next step in the acquisition process is to evaluate the specific parcel. After owners are identified, and typically after a Route Permit is issued for a project, a ROW representative personally contacts each property owner or the property owner's representative. The ROW agent describes the need for the transmission facilities and how the specific project may affect each parcel. The ROW agent also seeks information from the landowner about any specific construction concerns.

The ROW agent may request the owner's permission for survey crews to enter the property and conduct preliminary survey work. The agent may also request permission to take soil borings to assess soil conditions and determine appropriate foundation design. The soil analysis is performed by an experienced geotechnical testing laboratory. Surveys are conducted to locate the existing ROWs, natural features, man-made features and associated elevations for use during the detailed engineering of the line.

During the evaluation process, the location of the proposed transmission line would be staked. The survey crew identifies the future location of each structure or pole on the ground and places a

surveyor's stake to mark the location. The ROW agent shows the landowner exactly where the structure(s) would be located on the property. The ROW agent also delineates the boundaries of the easement area required for safe operation of the transmission line.

Prior to the acquisition of easements of property, land value data would be collected. Based on the impact of the easement or purchase to the market value of each parcel, a fair market value offer would be developed. The ROW agent would contact the property owner to present the offer for the easement and discuss the amount of just compensation to acquire the rights to build, operate, and maintain the transmission facilities within the easement area and for reasonable access to the easement area. The agent would 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.

In nearly all cases, utilities 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 ROW agent prepares all of the documents required to complete each transaction. Some of the documents that may be required include easement, purchase agreement, or 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 Minn. Stat. Chapter 117. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, the ROW 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 per 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 Minn. Stat. § 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. In the event of a condemnation, the utility would provide the landowner with a copy of each appraisal it has obtained for the land or property rights.

To start the condemnation process, a utility files a Petition in the district court where the property is located and serves that Petition on all owners of the property. If the court approves the Petition, the court then appoints a three-person condemnation "commission." The three people must understand applicable real estate issues. Once appointed, the commissioners schedule a viewing of the substation location or 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.

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

5.1.4 Construction Procedures

Minnesota Power would begin construction after appropriate federal, state, and local approvals are obtained, property and ROWs are acquired, soil conditions are established, and a final design is completed. The precise timing of construction would take into account various requirements that may be in place due to permit conditions, system loading issues, and available workforce.

Minnesota Power's construction process would follow standard construction and mitigation practices, including best management practices (BMPs) that were developed from experience with past projects. These practices address staging, erecting HVTL structures, and stringing HVTLs. Construction and mitigation practices to minimize impacts would be developed by Minnesota Power based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other factors. In some cases, activities or schedules may be modified to minimize impacts on sensitive environmental features.

HVTL structures are generally designed for installation at existing grades. However, some sloped work areas may need to be graded or filled in order to establish a more level work surface for structure installation. If the landowner permits, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities, if any. If permission is not obtained, the site is graded back to its original condition to the extent feasible and imported fill is removed.

Typical construction equipment that may be used for the proposed Project includes tree removal equipment, line construction equipment, stringing equipment, and general construction equipment on rubber tires or tracks, as appropriate. Staging areas are often established for the proposed Project, which are required for accommodating the equipment and materials necessary to construct the new HVTL facilities. The materials are stored at staging areas until they are needed for the proposed Project.

Minnesota Power may also require staging areas for additional space for storage during construction. These areas have not been identified at this time, but would typically be selected for their location, access, security, and ability to efficiently and safely warehouse supplies. The temporary staging areas outside of the ROW would be obtained by Minnesota Power through rental agreements.

Minnesota Power would access the ROW from existing roads or trails that run parallel or perpendicular to the ROW. In some situations, private field roads or trails may be used. Where necessary to accommodate the heavy equipment used in construction, including cranes, cement trucks, and hole-drilling equipment, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches. To the extent possible, Minnesota Power would coordinate these activities with the affected property owner(s) and/or state and local highway departments as appropriate.

Structure installation first begins by moving structures from the staging areas and delivering them to a staked location. The structures are typically staged within the ROW until the structure is set. Depending on site conditions, structures may be framed in the ground and lifted into place, or the structures may be set first and then bracing and hardware attached.

Most structures would be direct embedded. The area around the structure is then backfilled with crushed rock and/or soil. In lowland areas with poor soil capacity, Minnesota Power would use galvanized steel culverts to increase structure stability.

Angle structures as well as some tangent structures would typically be guyed. Guy wires would be anchored using screw anchors, cross plate anchors, or rock anchors depending on the soil conditions encountered.

After the structures have been assembled, set, and secured, conductors would be installed by establishing stringing setup areas along the route. The conductors would then be pulled with a rope lead that connects to each structure through dollies attached at the insulator locations.

Environmentally sensitive areas (e.g., wetlands) may require special construction techniques, which may vary according to conditions at the time of construction. Impacts to wetlands would be avoided to the extent practicable. A map of wetlands is included in Appendix B. According to the National Wetlands Inventory (NWI), a limited number of small wetlands cross the proposed route. Wetlands would be field delineated during the 2014 growing season. The required permits would be acquired at this time. In the event that wetlands cannot be avoided, impacts would be minimized by Minnesota Power to the extent possible. Additionally, Minnesota Power would use construction practices that help prevent soil erosion and would take measures to ensure that equipment fueling and lubricating would occur at a distance from waterways. Additional mitigative measures relating to wetlands are contained in Section 6.5.2.3.

Substation construction requires stripping of topsoil, excavation of material for installation of shallow and “deep” (non-surface/drilled shaft) foundations, erection of structural steel, installation of above- and below-grade electrical conduit, conductors and equipment, placement of gravel and crushed rock surfacing, and establishment of a fenced perimeter.

A modular industrialized Electrical Equipment Enclosure (EEE), approximately 20 feet wide, 40 feet long, and 14 feet in height would be utilized at the site. The EEE would be fabricated off-site, and would be completed on-site upon delivery of the multiple modules. Some structural steel components may be as much as 60 feet in height, but a majority would be 20 feet or less in height. Accordingly, a tele-handler implement, and a rough- or all-terrain crane, would be required intermittently. The "deep" foundations would have a maximum depth of 20 feet, and would be excavated by an earth auger.

Substation equipment would be trucked to the site and may require additional assembly before final placement. During the construction phase of the substation, there would be staging and temporary storage of equipment and supplies, as well as the creation of stockpiles of excavated material, in the immediate vicinity and limits of the substation site and aforementioned staging areas. These items would be removed at the conclusion of the construction phase.

5.1.5 Transmission Line Removal Procedures

The proposed Project would not require any transmission line removal.

5.1.6 Restoration Procedures

Minnesota Power would attempt to limit ground disturbance during construction wherever possible. However, disturbance would occur during the normal course of work, which would take several weeks. As construction is completed (weather permitting), Minnesota Power would restore disturbed areas to their original condition to the maximum extent practicable. Some restoration may not be performed consecutively with the completion of construction, but would be done as soon as conditions practicably allow. The ROW agents would attempt to contact each property owner after construction is completed to assess if any remaining damage has occurred as a result of the proposed Project. If damage has occurred to crops, fences or the property, Minnesota Power would fairly reimburse the landowner for the damages sustained that are not repaired or restored by Minnesota Power or its representatives. In some cases, Minnesota Power may engage an outside contractor to restore the damaged property as nearly as possible to its original condition.

Portions of vegetation that are disturbed or removed during construction of the HVTLs would naturally reestablish to pre-disturbance conditions. 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 HVTL route may require assistance in reestablishing the vegetation stratum and controlling soil erosion. Commonly used methods to control soil erosion and assist in reestablishing vegetation include re-seeding and mulching, erosion control blankets, silt fence installation, and minimizing soil disturbance during construction. To avoid adversely impacting reptile and bird species, Minnesota Power would not use plastic mesh erosion control materials.

These erosion control and vegetation establishment practices are regularly used in construction projects and are referenced in the construction permit plans. These construction techniques typically minimize long-term impacts that may result from the proposed Project.

The Minnesota Noxious Weed Law (Minn. Stat. § 18.75-18.91) defines a noxious weed as an annual, biennial, or perennial plant that the Commissioner of Agriculture designates to be injurious to the public health, the environment, public roads, crops, livestock, or other property. The Minnesota Department of Agriculture's Noxious & Invasive Weed Program assists local governments and landowners with resources for managing noxious and invasive weeds throughout Minnesota. Minnesota Power would attempt to limit the spread of noxious and invasive weeds by cleaning construction equipment before it enters the construction work area and using only invasive-free mulches, topsoil, and seed mixes. Permanent vegetation would be established in areas disturbed within the construction work area except in actively cultivated areas and standing water wetlands. Seed used would be purchased on a "Pure Live Seed" basis for seeding re-vegetation areas. The seed tags on the seed sacks would also certify that the seed is "Noxious Weed Free."

Minnesota Power may use both herbicides and/or mechanical methods to control the spread of noxious weeds. All herbicides used by Minnesota Power are approved by the Environmental Protection Agency and the State of Minnesota Department of Agriculture. These herbicides are applied by commercial pesticide applicators that are licensed by the Minnesota Department of Agriculture. If during post-construction monitoring of the restored ROW a higher density and cover of noxious weeds on the ROW is noted when compared to adjacent off ROW areas, Minnesota Power would obtain landowner permission and work to mitigate noxious weed concerns.

5.1.7 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, HVTLs are seldom completely retired. Transmission infrastructure has very few mechanical elements and is built to withstand weather extremes that are normally encountered. With the exception of severe weather such as tornadoes and heavy ice storms, transmission lines rarely fail. Should the transmission lines be completely retired, MN Power would remove them according to the terms detailed in the licensing agreements with Magnetation.

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, for 115 kV, past experience shows that costs are approximately $400 to $600 per mile. Actual line-specific maintenance costs depend on the setting, the

amount of vegetation management necessary, storm damage occurrences, structure types, materials used, and the age of the line.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendations. The Substation Location must be kept free of vegetation and adequate drainage must be maintained. Minnesota Power personnel are typically on site at least once a week and maintenance needs are noted and scheduled for completion.

5.2 Electric and Magnetic Fields

The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines (referred to as "extremely low frequencies" (ELF)), EMF should be separated into electric fields (EFs) and magnetic fields (MFs), measured in kV 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 EF is proportional to the voltage of the line, and the intensity of the MF is proportional to the current flow through the conductors. Transmission lines operate at a power frequency of 60 hertz (Hz, cycles per second).

5.2.1 Health and Environmental Effects

Considerable research has been conducted in recent decades to determine whether exposure to power-frequency (60 Hz) electric and MFs can cause biological responses and adverse health effects. The multitude of epidemiological and toxicological studies has shown at most a weak association (i.e., no statistically significant association) between EMF exposure and health risks.

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

The United States Environmental Protection Agency (USEPA) seems to have come to a similar conclusion about the link between adverse health effects, specifically childhood leukemia, and power-frequency EMF exposure. On its website, the USEPA states:

> Many people are concerned about potential adverse health effects. Much of the research about power lines and potential health effects is inconclusive. Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related

> to an increased risk of childhood leukemia, there is still no definitive answer. The general scientific consensus is that, thus far, the evidence available is weak and is not sufficient to establish a definitive cause-effect relationship.

Minnesota, California, and Wisconsin have each conducted their own literature reviews or research to examine this issue. In 2002, Minnesota formed an Interagency Working Group to evaluate the research and develop policy recommendations to protect the public health from any potential problems arising from EMF effects associated with HVTLs. The Minnesota Department of Health published the Working Group's findings in "A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options". The Working Group summarized its findings as follows:

> Research on the health effects of EMF has been carried out since the 1970's. 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.

Based on findings like those of the Working Group and NIEHS, the Commission has consistently found that "there is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects." This conclusion was further justified in the recent Route Permit proceedings for the Brookings County – Hampton 345 kV Project ("Brookings Project"). In the Brookings Project Route Permit proceedings, the Applicants (Great River Energy and Xcel Energy) and one of the intervening parties both provided expert evidence on the potential impacts of electric and magnetic fields on human health. The administrative law judge (ALJ) in that proceeding evaluated written submissions and a day-and-a-half of testimony from the 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 [EMF] exposure." The Commission adopted this finding in its September 14, 2010 order for the Brookings Project.

5.2.2 Electric Fields

While there is no official state or federal standard for transmission line EFs, the Environmental Quality Board (EQB) has developed a guideline of a maximum EF limit of 8 kV/m measured at one meter above the ground. The guideline was designed to prevent serious hazards from shocks when touching large objects parked under alternative current (AC) transmission lines of 500 kV or greater. Table 6 provides the EFs at maximum conductor voltage for the proposed Project. The EFs calculations are also show graphically in Figure 5. Maximum conductor voltage is defined as the nominal voltage plus ten percent.

This is generally an emergency condition, and Minnesota Power typically operates its transmission system between 101 percent and 104 percent of nominal voltage under normal conditions.

Due to the conductor configuration of the two parallel 115 kV H-Frame type structure, the peak EF for this configuration actually occurs at approximately 9 feet from the centerline of the ROW, and is not given in Table 6 The maximum EF was calculated to be 1.93 kV/m at one meter above ground.

Table 6 Calculated Electric Fields (kV/m) for Proposed Transmission Line Designs One Meter (3.28 feet) above ground

Structure Type	Maximum Operating Voltage (kV)	Distance to Proposed Centerline (feet) of ROW												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
2 Parallel 115 kV H-Frame	126.5	0.01	0.02	0.17	0.50	1.43	1.00	1.90	1.00	1.43	0.50	0.17	0.02	0.01

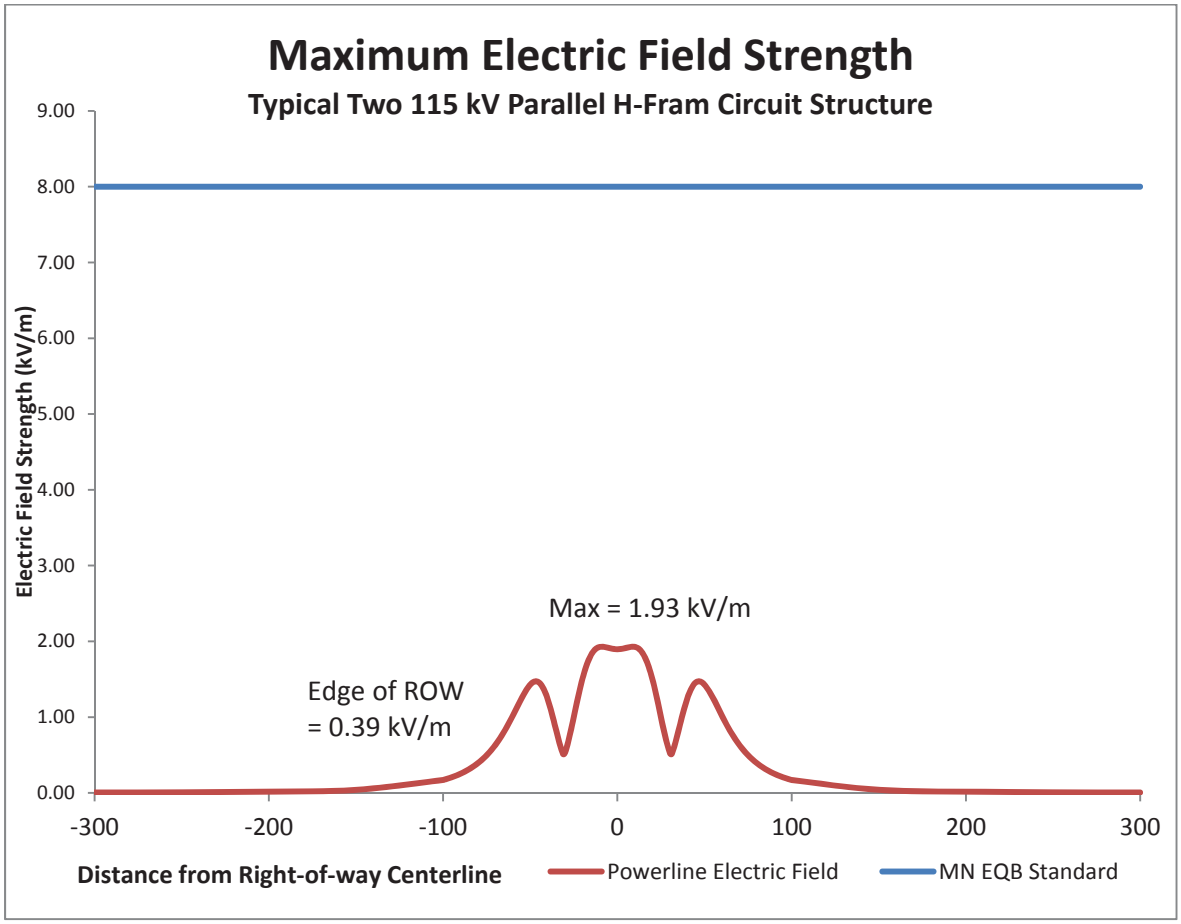


Figure 5 Calculated Electric Fields (kV/m) for Proposed Transmission Line Designs One Meter (3.28 Feet) above ground

5.2.3 Magnetic Fields

There are presently no federal or Minnesota regulations pertaining to MF exposure. The EQB and the Commission have recognized that Florida (a 150 mG limit) and New York (a 200 mG limit) are the only two state standards in the country. Recent studies of the health effects from power frequency fields conclude that the evidence of health risk is weak[1], [2], [3]. The general standard is one of prudent avoidance. The Applicant provides information to the public, interested customers and employees so they have an understanding of the MFs associated with the proposed Project.

The MF profiles around the proposed transmission line for each structure and conductor configuration being considered for the proposed Project are shown in Table 7. MFs were calculated at the conductor's thermal limit based on the design of the HVTL and at the expected peak loading on the lines based on power flow modeling of the transmission system. The peak MF values are calculated at a point directly under the HVTL and where the conductor is closest to the ground. The same method is used to calculate

the MF at the edge of the ROW. MF profile data show that MF levels generally decrease rapidly as the distance from the centerline increases.

Due to the conductor configuration of the two parallel115 kV H-Frame type structure, the peak MF for this configuration actually occurs at approximately 27 feet from the centerline of the ROW, and is not given in Table 7. This peak MF was calculated to be 154.73 mG under the conductor thermal limit condition and 52.86 mG under the expected peak loading condition.

Because the actual power flow on a transmission line could potentially vary widely throughout the day depending on electric demand, the actual MF level could also vary widely from hour to hour. In any case, the typical loading of the transmission line would be far below the thermal limit of the line and should remain at or below the expected peak loading for the foreseeable future, resulting in typical MFs well below those indicated in Table 7. The magnetic fields calculations are also shown graphically in Figures 6 and 7.

Table 7 Calculated Magnetic Fields (mG) for Proposed Transmission Line Design

Structure Type	Current (Amps)	Distance to Proposed Centerline (feet) of ROW												
		-300	-200	-100	-75	-50	-25	0	25	50	75	100	200	300
Magnetic Field Profile at Conductor Thermal Limits														
2 Parallel 115 kV H-Frame	West: 602.5 / East: 602.5	0.34	1.18	10.35	26.41	87.79	154.72	113.89	154.72	87.79	26.41	10.35	1.18	0.34
Magnetic Field Profile at Expected Peak Loading														
2 Parallel 115 kV H-Frame	West: 214.1 / East: 149.6	0.19	0.57	4.11	9.95	31.44	52.72	34.41	40.70	21.62	6.02	2.15	0.15	0.02

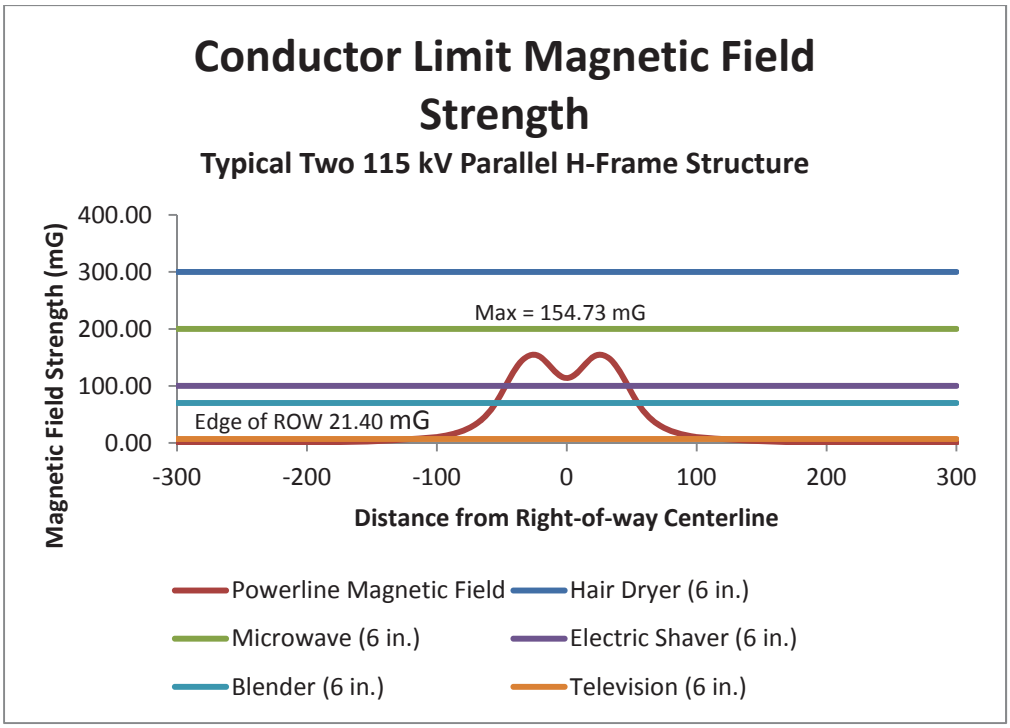


Figure 6 Conductor Limit Magnetic Field Strength

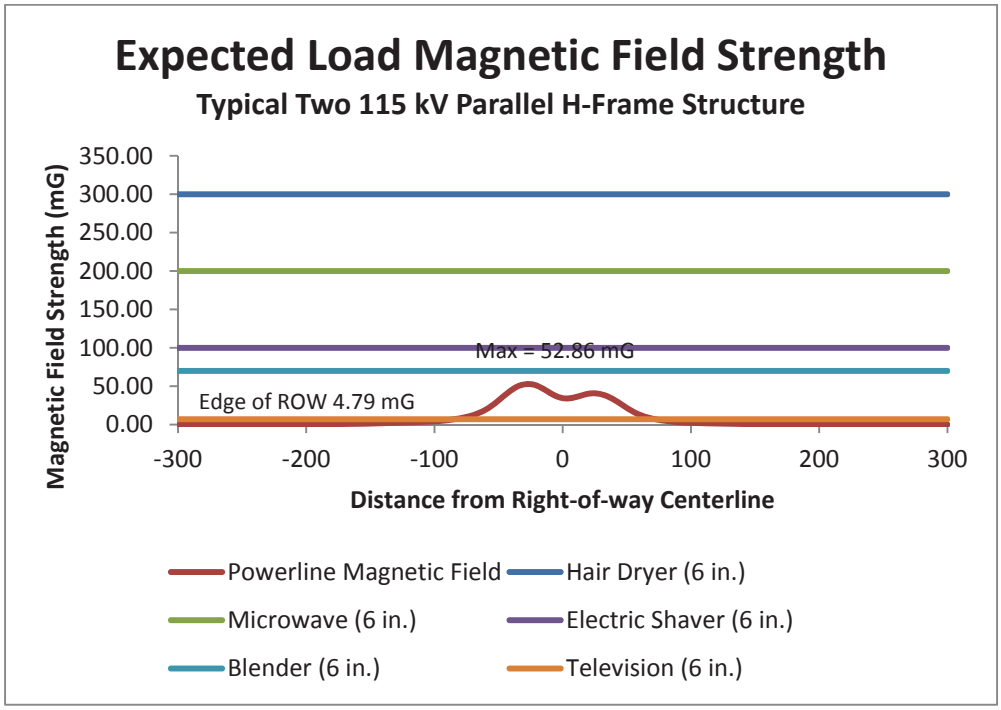


Figure 7 Expected Load Magnetic Field Strength

5.2.4 Stray Voltage

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, and can occur on the electric service entrances to structures from distribution lines, not HVTLs. HVTLs do not, by themselves, create stray voltage because they do not connect to businesses or residences. HVTLs, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the HVTL. Appropriate measures would be taken to prevent stray voltage problems when the proposed HVTL parallels or crosses distribution lines.

5.2.5 Farm Operations, Vehicle Use and Metal Buildings Near Power Lines

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

There is a potential for vehicles under HVTLs to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap 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 would not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the ROW 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 ROW 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 the Applicant for further information about proper grounding requirements.

If a customer suspects that stray voltage/neutral to earth voltage (NEV) is a concern on their property, they can call the Minnesota Power stray voltage hotline 1-800-228-4966 ext. 5031. The customer can contact a Minnesota Power technician or engineer and discuss the situation. If an on-farm investigation is warranted it would be scheduled. On the day of the investigation, the Minnesota Power team would arrive and conduct an investigation of the utility system serving the farm and the farm wiring. The team would discuss the preliminary results with the customer before leaving the farm. In most instances, recording volt meters would be set to measure activity over several days. A few days later these would be retrieved by Minnesota Power for analysis. Upon completing the analysis, a Minnesota Power engineer or technician would call the customer to discuss the results.

6.0 Environmental Information

This section analyzes potential resource impacts associated with the proposed Project. This section provides a description of the environmental setting, potential impacts, and mitigative measures the Applicant proposes, where appropriate, to minimize the impacts of siting, constructing, and operating the proposed Project. If the proposed transmission lines and the substation were removed in the future, the land would be restored to its prior condition as legally required. The majority of the measures proposed are part of the standard construction process for the Applicant. Unless otherwise identified in the following text, the costs of the mitigative measures proposed are considered nominal.

6.1 Environmental Setting

The proposed Project is located north and west of the Canisteo Pit, near the Cities of Coleraine and Bovey, Minnesota in central Itasca County. The proposed Project is located near existing industrial land use and some residential land.

The Project area is located within the Northern Minnesota Drift and Lake Plains Section, a section within the biogeographic province known as the Laurentian Mixed Forest Province under the Ecological Classification System (ECS) developed by the Minnesota Department of Natural Resources (MnDNR)[4]. The Project area located in the St. Louis Moraines Subsection of the Northern Minnesota Drift and Lake Plains Section, near the transition between the Nashwauk Uplands and St. Louis Moraines Subsections[4]. The St. Louis Moraines Subsection is characterized by gently rolling to rolling lake plains and till plains. The Mississippi river bisects this Subsection. The project area includes Lowland Black Spruce, Aspen, Maple, and Pine. Much of this subsection is presently forested and forestry is one of the most important land uses. Tourism and recreation associated with lake and outdoor activities are also important in the region. Agriculture is also an important local land use, but is primarily prevalent in the western part of the subsection.

6.2 Human Settlement

6.2.1 Public Health and Safety

A large portion of the project area shows signs of previous mining and industrial activity. The remaining portion is relatively remote, separated from the Cities of Coleraine and Bovey by the Canisteo Pit. There are two seasonal hunting cabins located within the proposed route, see Figures B.4a and B.4c.

Minnesota Power would implement proper safeguards during construction and operation to avoid potential impacts public health and safety. Concerns related to health and safety include hazards associated with coming into contact with energized equipment, induction, and stray voltage. In general, impacts to public health and safety from the project are not anticipated.

6.2.1.1 Mitigative Measures

The proposed Project would be designed in compliance with local, state, NESC, and Minnesota Power standards for clearance to ground, crossing utilities and buildings, strength of materials, and ROW

widths. Minnesota Power would ensure that construction and contract crews comply with local, state, NESC, and Company standards for installation of facilities and standard construction practices. Minnesota Power and industry safety procedures would also be followed after the proposed Project is installed. This would include clear signage during all construction activities.

The proposed HVTL would be equipped with protective devices (circuit breakers and relays located in the substation where the transmission lines terminate) to safeguard the public if an accident occurs, such as a structure or conductor falling to the ground. The protective equipment would de-energize the transmission line should such an event occur. Minnesota Power would post signage to warn the public about the risk of coming into contact with the energized equipment. The proposed Substation would be fenced and signed as well. With implementation of safeguards and protective measures, the proposed Project is not anticipated to result in adverse or significant impacts on public health and safety.

6.2.2 Residential and Non-Residential Land Use

The proposed Routes would cross areas zoned as tourism/recreational, municipal, industrial, and public. Construction of the proposed HVTLs on land zoned as tourism/recreational would not adversely affect recreation or limit movement.[5]

Table 8 Residential and Non-residential Buildings within Various Distances of Proposed Route

Structure Type	Proposed Route	Number of Structures within Various Distances	
		Within ROW	Within One Mile of Proposed Route
Residence	115 kV Route	0	78
Commercial Structure	115 kV Route	0	13

The proposed Project would not require displacement of residences or commercial businesses. There are three dwellings within 1,250 feet of the proposed alignment centerline. The first is north of County Road 353 in S19, T56, R24 and lies 1,250 feet north of the proposed centerline. The second is south of an unnamed waterbody at the intersection of sections 17 and 20 (T56, R24) and lies approximately 900 feet northwest of the proposed centerline. The third is north of Reilly Beach Road in S16, T56, R24 and lies approximately 700 feet west of the proposed centerline. (Figures B.4a, B.4b, and B.4c show these dwellings and their relation to the proposed alignment.) All three dwellings are in forested areas so the aesthetics of the properties would not be adversely affected by the proposed Project, especially when the ROW naturally re-vegetates and reverts to a more natural appearance post-construction.

Minnesota Power would seek to construct the HVTL consistent with any applicable zoning ordinances. However, no zoning, building, or land use approvals would be required from surrounding municipalities

if a Route Permit is issued for the proposed Project because once the Commission issues a Route Permit, zoning, building, and land use regulations and rules are preempted per Minn. Stat. § 216E.10, subd. 1. No adverse or significant impacts on residential or commercial structures as a result of the proposed Project are anticipated.

6.2.2.1 Mitigative Measures

As discussed in section 4.2.2 as part of the planning process, the Applicant assessed the general area surrounding the proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the proposed Project. A team of siting, ROW, planning, environmental, ecological, and engineering personnel worked together to develop proposed Routes that minimize overall impacts of the proposed Project. Based on this work and the remote location, the proposed Project is able to avoid displacement of homes. If the alignment deviates from the proposed centerline due to unforeseen challenges, every effort will be made to maintain a 500-foot buffer from the dwellings cited above. Because no displacement would occur, no additional mitigative measures are proposed.

6.2.3 Noise

Transmission conductors produce noise under certain conditions. The level of noise depends on conductor conditions, voltage level, and weather conditions. Generally, activity-related noise levels during the operation and maintenance of transmission lines are minimal.

Noise emissions from a transmission line occur during certain weather conditions. In foggy, damp, or rainy weather, power lines can create a crackling sound when a small amount of electricity ionizes the moist air near the wires. During heavy rain, the background noise level of the rain is usually greater than the noise from the transmission line. As a result, people do not normally hear noise from a transmission line during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines can produce noise. Noise levels produced by a 115 kV transmission line are generally less than outdoor background levels and are therefore not usually audible. At substations, the source of noise is primarily the transformers, which can create a humming noise.

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 decibels (dBA). 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 9 shows noise levels associated with common, everyday sources.

Table 9 Common Noise Sources and Levels

Noise Source*	Sound Pressure Level (dBA)
Jet Engine (at 25 meters)	140
Jet Aircraft (at 100 meters)	130
Rock Concert	120
Pneumatic Chipper	110
Jackhammer (at 1 meter)	100
Chainsaw. Lawn Mower (at 1 meter)	90
Heavy Truck Traffic	80
Business Office, Vacuum Cleaner	70
Conversational Speech, Typical TV Volume	60
Library	50
Bedroom	40
Secluded Woods	30
Whisper	10

Source: Minnesota Pollution Control Agency[6].

In Minnesota, statistical sound levels ("L" or Level Descriptors) are used to evaluate noise levels and identify noise impacts. 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} may be exceeded 10 percent of the time within 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 Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories. Residential areas, churches, and similar type land use activities are included in NAC 1; commercial-type land use activities are included in NAC 2; and industrial-type land use activities are included in NAC 3.

Table 10 identifies the established daytime and nighttime noise standards by NAC.

Table 10 Noise Standards by Noise Area Classification (dBA)

NAC	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

The audible noise associated with the proposed transmission line was modeled using the Corona and Field Effects (CFE) spreadsheets developed by the Bonneville Power Administration. Table 11 presents the L_5 and L_{50} noise levels predicted for proposed transmission line structures and voltages for the proposed Project. The worst case indicated that the audible L_5 and L_{50} noise levels measured at the edge of the ROW (80 feet from centerline) are associated with the two parallel 115 kV line and would be 24.14 and 20.64 dBA, respectively, well below the MPCA limits for the relevant noise area classifications (NAC 1, NAC 2 and NAC 3) in the area crossed by the line.

Table 11 Calculated Audible Noise (dBA) for Proposed Transmission Line Designs

Structure Type	Noise L_5 (Edge of ROW) (Decibels a weighted)	Noise L_{50} (Edge of ROW) (Decibels a weighted)
Two Parallel 115 kV H-Frame	24.14	20.64

The noise generated from the proposed HVTLs is not expected to exceed background noise levels and would, therefore, not be audible at any receptor location. The noise level is well below the MPCA limits for the relevant noise area classifications (NAC 1). The proposed HVTLs would be designed and constructed to comply with state noise standards established by the MPCA. Any audible noise would be below the MPCA noise standards established for NAC 1. Additionally, it is not anticipated that the proposed Project would increase noise from transmission line conductors or any associated facilities above the levels already experienced in the area.

Transformer “hum” is the dominant noise source at substations. Transformer hum is caused by magnetorestrictive 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 100 Hz (twice the a.c. main’s 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.

Given the distance of over 1.25 miles from the proposed Substation Location to the nearest home, it would be very unlikely that substation noise would be audible to residents. The proposed Substation would be designed and constructed to comply with state noise standards established by the MPCA. It is also likely that noise from mine operations would exceed those of the substation.

With implementation of state design and construction standards, the proposed Project is not anticipated to result in adverse or significant impacts on the public as a result of noise.

6.2.3.1 Mitigative Measures

As discussed in section 4.2.2 as part of the planning process, the Applicant assessed the general area surrounding the proposed Project to identify significant routing issues that might arise and to evaluate environmental resources in the vicinity of the proposed Project. A team of siting, ROW, planning,

environmental, ecological, and engineering personnel worked together to develop proposed Routes that minimize overall impacts of the proposed Project. Based on this work the proposed Project has been designed to avoid proximity to homes and no additional mitigative measures are proposed.

6.2.4 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 ROW to either side.

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

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

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, the Applicant would 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.

6.2.4.1 **Mitigative Measures**

The Applicant does not anticipate that the proposed Project would create interference with radio or television signals, however if radio or television interference occurs due to the proposed Project, the Applicant would work with the affected landowner to restore reception to pre-Project quality.

6.2.5 Aesthetics

Aesthetics refer to the natural and human modified landscape features or visual resources that contribute to the public's experience and appreciation of the environment. Wetlands, surface waters, landforms, forests, and vegetation patterns are among the natural landscape features that define an area's visual character. Buildings, roads, bridges, and other structures reflect human modifications to the landscape. The scenic value or visual importance of an area is a subjective matter and depends upon the perception and philosophical and/or psychological response of the viewer. Generally, landscapes that exhibit a high degree of variety and harmony among the basic elements of form, line, color, and texture have the greatest potential for high visual and aesthetic quality. The level of impact to visual resources is also subjective and generally depends on the sensitivity and exposure of a particular viewer and can, therefore, vary greatly from one individual to the next.

The proposed Project area is zoned as municipal, tourism/recreational, industrial, and public. There are two seasonal hunting cabins within the proposed 1,000 foot route. Both dwellings located within the proposed route are in forested areas so the aesthetics of the properties would not be adversely affected by the proposed Project, especially when the ROW naturally re-vegetates and reverts to a more natural appearance post-construction.

The area is not a uniquely scenic and/or undisturbed natural area. The HVTLs would be visible to individuals near the ROW and to those at elevated positions in the area. Due to the previous high levels of disturbance relating to mining activities, the area is not considered to have high visual resource value. Combined with rolling terrain, the HVTLs would not have a significant impact on the overall landscape. The substation would be constructed adjacent to the Magnetation plant. The previously mined area is forested and the substation would not be visible from a distance.

6.2.5.1 Mitigative Measures

Because the HVTLs and substation would not have a significant impact on the overall landscape, not mitigative measures are planned.

6.2.6 Socioeconomic

Population and economic characteristics based on the 2010 U.S. Census are provided in

Table 12. As reported in the 2010 U.S. Census, the population density of Itasca County is 16.9 people per square mile. Minorities and persons living in poverty make up 5.5 percent and 11.4 percent of the population, respectively. For comparison, minorities comprise 15.9 percent of the statewide population and 11 percent of Minnesota residents live in poverty[7].

The minority population percentages in Coleraine and Bovey are similar to the county as a whole. Per capita income in the cities is approximately 25% below the average for Itasca County.

Table 12 Population and Economic Characteristics

Location	Population	Minority Population (percent)	Caucasian Population (percent)	Per Capita Income	Percentage of Population Below Poverty Level
Coleraine[8]	1,970	4.6*	95.4	16,514	9.8
Bovey[9]	804	6.2*	93.8	16,127	22.3
Itasca County[10]	5,303,925	5.5*	93.7	24,067	11.4

*Sum of Black persons, American Indian and Alaska Native persons, Asian persons, Native Hawaiian and Other Pacific Islander persons and Persons of Hispanic or Latino Origin percentages.

Approximately 24 to 30 workers would be required for transmission line construction and 20 to 30 workers would be needed for the substation construction.

There would be minor short-term impacts to community services as a result of construction activity and an influx of contractor employees during construction of the proposed Project. Utility personnel or contractors would be used for all construction activities. The communities near the Project area may experience a minor short-term positive economic impact through the use of the hotels, restaurants, and other services by the various workers.

The HVTL and substation Project would not have any long term employment impacts on the area itself, but the Project is necessary for construction of the Magnetation mining project which would create 160 long term jobs in the area.

The proposed Project is consistent with the 2013 Itasca County Comprehensive Land Use Plan. The Plan includes the following goals:[11]

> *Natural Resource Goal:* Promote land and water uses that result in the sustainable use of natural resources, balancing development and environmental commitment to conserve and enhance the natural beauty and resources of the County for this and the next one-thousand years.
>
> *Commercial/Industrial Goal:* Encourage a sound and diverse economy that meets the needs of Itasca County residents and visitors for employment and services.
>
> *Mining Industry Objective*: Support the continuation and expansion of the mining industry. Encourage value-added processing and the use of mining products in the County and ensure availability of mineral resources for mining while mitigating the impact on surrounding areas.

6.2.6.1 Mitigative Measures

Socioeconomic impacts resulting from the proposed Project would be primarily positive with an influx of wages and expenditures made at local businesses during project construction, and increased tax revenue once the proposed Project is operational. In addition, the proposed Project is needed to facilitate Magnitation's $120 million dollar mining project that would have a very positive economic impact on the Grand Rapids area. No mitigative measures are proposed.

6.2.7 Cultural Values

Cultural values include those perceived community beliefs or attitudes that provide a framework for unity in a given community. The communities near the proposed Project appear to value outdoor recreation and the scenic nature of the north woods region. The communities in the Project area have cultural ties to German, Norwegian, Swedish, Irish, English, French, Serbian/Croatian, and Native American heritages[8,9]. The proposed project is not expected to impact the framework or sense of unity of the community and would not alter features in the area that contribute significantly to the cultural nature of the region.

6.2.7.1 Mitigative Measures

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

6.2.8 Recreation

The Project area is located in a region that is known for its outdoor recreation opportunities. The region includes vast areas of forest, lakes, rivers, and streams, making it a destination for outdoor recreation. The area offers opportunities for walleye and northern pike fishing, kayaking, boating, cycling, hiking, hunting, cross country skiing, and snowmobiling.

The proposed Project is located north of Mount Itasca winter sports facility which includes alpine skiing, snowboarding, cross country skiing, biathlon, ski jumping, and tubing activities. The proposed Project is across County Highway 61 and the Canisteo Pit from this facility and would not have any adverse impact on it. Hill Annex Mine State Park is 5.6 miles east and the Keystone Snowmobile Trail passes 0.16 miles to the south of the proposed Project area. There are numerous tourist attractions in the City of Grand Rapids, MN approximately four miles southwest of the proposed Project area.

6.2.8.1 Mitigative Measures

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

6.2.9 Public Services

Public services and facilities in the proposed Project area generally include emergency services provided by government entities, including hospitals, fire departments, and police departments, water supply or wastewater disposal systems, and gas and electricity services, and existing and future transportation corridors and projects.

The nearest hospital is Grant Itasca, located approximately 9 miles away in the City of Grand Rapids. The HVTLs would only cross one road, Reilly Beach Road, and is therefore unlikely to have an impact on public services outside of short closures for initial construction.

6.2.9.1 Emergency Services

Any required temporary lane closures on Reilly Beach Road be coordinated with the local jurisdictions, and would provide for safe access of police, fire, and other rescue vehicles.

6.2.10 Utilities

Construction and operation of the proposed Project is not anticipated to impact any public service utilities.

6.2.11 Transportation and Traffic

Transportation infrastructure in the proposed Project area includes roads and one railroad. The proposed Route runs from the existing Minnesota Power 28 Line west of Scenic Highway and crosses Reilly Beach Rd as it traverses south to the Canisteo Pit then southwest to the proposed Canisteo Substation. Roadways can potentially be impacted temporarily during construction activities and during maintenance of the transmission line. Impacts could result from construction vehicles and safety perimeters temporarily blocking public access to streets and businesses. Access during construction and maintenance is expected to be primarily from existing roads. Due to the temporary nature of the proposed construction activities, traffic disruptions are expected to be minor and temporary. Structure placement along roadways can also impact future road expansions, as structures placed within the ROW must be moved to allow a safe distance between structures and the edge of the roadway. Comments were requested regarding the proposed Project from both Itasca County and the Minnesota Department of Transportation (MnDOT) (Appendix D). To date, no response has been received.

The closest airport to the proposed Project area is the Grand Rapids/Itasca County Airport, which is located approximately seven miles away south of the City of Grand Rapids, Minnesota. Tall HVTLs can conflict with the safe operation of public and private airports and air strips. The Federal Aviation Administration (FAA) and MnDOT have each established development guidelines on the proximity of tall structures to public use airports. The FAA has also developed guidelines for the proximity of structures to Very-High-Frequency Omni-Directional Range (VOR) navigation systems. Due to the distance between the Grand Rapids/Itasca County Airport and the proposed Project, construction and operation of the line and substation are not anticipated to impact safe operation and use of the airport.

6.2.11.1 Mitigative Measures

No impacts to emergency services are anticipated, Minnesota Power would minimize potential impacts through coordination of the construction with local and state road authorities and use signage during construction to alert drivers. No significant conflicts are anticipated.

Operation of the transmission line is not expected to impact traffic along these roadways and pole placement and construction procedures would be developed in consultation with state and county roadway authorities to meet requirements for clear zones and roadside obstructions. Planning for the proposed Project would also be coordinated with MnDOT and Itasca County transportation policies to minimize impacts from construction of the proposed Project.

6.3 Land Based Economics

6.3.1 Agriculture

Federal regulations define prime farmland as "land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses." (7 C.F.R. 657.5(a)(1)) identifies the types and acreages of farmland within the proposed Routes and proposed Substation Location. The National Land Cover Dataset (2006) does not identify any croplands in the HVTL route.

Areas identified as prime farmland and as prime farmland if drained (soils that have the potential to be prime farmland but would require hydrologic alteration) do not occur within the HTVL route. See Figure B.1.

6.3.1.1 Mitigative Measures

Because there is no farmland within the project route, no mitigative measures are planned.

6.3.2 Forestry

There are no known tree farms or federal or state forests located within the proposed Routes or proposed Substation Location. There is one quarter quarter-section that intersects the 1,000 foot route that is administered by the MnDNR Department of Forestry. See Figure B.4. The MnDNR was contacted as part of the scoping effort (see Appendix A) and the Applicant did not receive any comments regarding this forestry area.

6.3.2.1 Mitigative Measures

No impacts to forestry resources are anticipated and, therefore, no mitigative measures are proposed.

6.3.3 Tourism

No formal tourist areas are present within the proposed Route or proposed Substation Location area. However, nearby lakes, rivers, parks, forests, and the Mount Itasca winter sports facility, provide a variety of outdoor recreational activities for tourists visiting the area. A portion of the proposed Route crosses land zoned as Tourism/Recreational but the Applicant is unaware of any planned tourism or recreational development for the area.[11]

6.3.3.1 Mitigative Measures

No impacts to tourism resources are anticipated and, therefore, no mitigative measures are proposed.

6.3.4 Mining

The proposed Project's objective is to provide power to Magnetation's new taconite mining operation. The majority of the approximately five-mile HVTLs would be on mine land. The proposed Project would have a positive impact on mining by enabling Magnetation's operation.

The Minnesota Department of Natural Resources has expressed concern about the proposed Project's impacts on access to iron resources (see Appendix A). According to the MnDNR:

"The projected route intersects active State iron mining leases and very likely will impact future access to, and use of, iron resources and auxiliary lands of the Mesabi Iron Range. If the line is to be routed as proposed or modified, the surface lessee/licensee (Minnesota Power) will work in conjunction with Division of Lands and Minerals Engineering and Development Section staff to determine a final route plan. Final terms of the lease/license for crossing state-administered lands will required prior approval of Peter Clevenstine, Assistant Director (Lands and Minerals-Hibbing) and should include language to ensure that any future realignment of the line will be conducted at Minnesota Power's expense and at the State's discretion."

6.3.4.1 **Mitigative Measures**

The proposed Project is being closely coordinated with Magnetation to ensure the proposed Route does not interfere with their planned mining operations. The proposed Route has been reviewed and, based on plant location, ore deposits, and future mining plans, is agreeable to Magnetation.

The Applicant will continue to coordinate with the MnDNR, as requested above, to ensure access to iron resources is not precluded.

6.4 Archaeological and Historic Resources

Archaeological and historic resources are those places that represent the visible or otherwise tangible record of human occupation. These resources vary in size, shape, condition, and importance, among other considerations; some are evident on the landscape, while others are buried or only visible to knowledgeable people.

Two Pines Resource Group, LLC conducted a cultural resources literature search for the proposed Project in September of 2013. See Appendix D. The proposed Project Route has not undergone an archaeological survey, nor have any archaeological sites or archaeological site leads been previously recorded within one-mile of the proposed Route. A portion of one historic district and four of 14 architecture-history properties have been previously inventoried within the study area (one-mile buffer around the proposed ROW). The Holman-Cliffs Iron Mining Landscape Historic District (Holman-Cliffs Historic District) and its contributing resources are considered eligible for (CEF) listing in the National Register. The proposed Route passes within one half mile of the boundary of the Holman-Cliffs Historic District.

Table 13 Identified Archaeological and Historic Resources within 1 Mile of the Proposed Project

Inventory Number	Name	T	R	S	Q	NRHP Status
IC-IRT-037	Holman-Cliffs Mine Pit	56N	24W	21	SE-NE	Considered Eligible for Listing (CEF)
		56N	24W	22	S-NW	
IC-IRT-038	Mesaba-Cliffs Lean Ore Dump	56N	24W	16	S-SE	Considered Eligible for Listing (CEF)
IC-IRT-039	Mesaba-Cliffs Stripping Dump	56N	24W	21	NW-NE and NE-SE	Considered Eligible for Listing (CEF)
IC-IRT-040	Cleveland-Cliffs Concentrator Plant Site	56N	24W	21	NW-NE-SE	Considered Eligible for Listing (CEF), pending survey

6.4.1.1 Mitigative Measures

In order to demonstrate compliance with Section 106 of the Historic Preservation Act required for USACE wetland permitting, the study area will be surveyed by a qualified specialist.

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. All of these potential effects are considered to be relatively minor, and all but the ozone effects are short-term.

State and federal governments currently regulate permissible concentrations of ozone and nitrogen oxides. 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. Currently, both state and federal governments regulate permissible concentrations of ozone and nitrogen oxides. The national standard is 0.075 parts per million (ppm) during an eight-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest eight-hour daily maximum average in one year.

The only potential air emissions from a transmission line result from corona, and such emissions are limited. Corona consists of the breakdown or ionization of air within a few centimeters immediately surrounding conductors and can produce ozone and oxides of nitrogen in the air surrounding the conductor. This process is limited because the conductor electrical gradient of a 115 kV transmission line

is usually less than that necessary for the air to break down. Typically, some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona.

Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived. There are currently no non-attainment areas listed for Itasca County[12].

During construction of the proposed HVTLs, minor emissions from vehicles and other construction equipment and fugitive dust from right-of-way clearing would occur, but would be limited. Air-quality impacts during the construction phase would also be temporary. The magnitude of construction emissions is heavily influenced by weather conditions and the specific construction activity. Exhaust emissions, primarily from diesel equipment, would vary according to the phase of construction, but would be minimal and temporary. Adverse impacts on the surrounding environment would be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

The proposed Project is not anticipated to result in adverse or significant effects on air quality.

6.5.1.1 Mitigative Measures

The Applicant would employ 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 would be used to minimize fugitive dust. Based upon this, the Applicant anticipates nominal impacts to air quality. Therefore, no other mitigative measures are proposed.

6.5.2 Water Resources

6.5.2.1 Water Quality

The proposed Project may have minor, short term effects on water quality. Impacts on water quality are possible during the construction phase of the proposed Project, when sediment could possibly reach surface waters as excavation, grading, and construction traffic disturb the ground.

6.5.2.2 Mitigative Measures

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 proposed Project, the Applicant would obtain the permit and prepare a 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. The SWPPP would outline strategies and steps that would be taken to prevent nonpoint source pollution discharging from construction areas.

Additionally, the proposed Canisteo Substation would have a crushed aggregate surface which would limit impacts to ground water and BMPs, such as silt fences, would be implemented in order to prevent or minimize water quality impacts during project construction. Using the previously outlined measures, no significant impacts to water quality are anticipated.

6.5.2.3 **MnDNR Public Waters Inventory**

The MnDNR Public Waters Inventory (PWI) identifies basins (lakes and wetlands) and watercourses over which the MnDNR has regulatory jurisdiction. The statutory definition of public water is found in Minn. Stat. § 103G.005, subd. 15 and 15a. There are no PWI basins within the proposed ROW. . See Figure B.2.

6.5.2.4 **Mitigative Measures**

Because there are no PWI basins within the proposed ROW, no mitigative measures are planned.

6.5.2.5 **Wetlands**

Wetland locations within the vicinity of the proposed Project area were initially identified using the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps. Subsequently, a desktop review was conducted to verify the presence and classification of the wetlands present within the proposed Route. Wetlands based on this desktop review are summarized in Table 14 and shown on Figure B.2.

Approximately 48 acres of wetland have been mapped within the proposed 115 kV HVTL route; this represents approximately 37 percent of the route. Hardwood swamps (29 percent), alder thicket/shrub-carr (22 percent), and shallow open water (22 percent) are the dominant wetland types within the route, followed by excavated ponds (16 percent), wet/sedge meadow (6 percent), and conifer swamp (5 percent). Approximately 15.9 acres of wetland, including hardwood, conifer, and shrub swamps, have been mapped within the proposed 115 kV HVTLs ROW; this represents approximately 23 percent of the ROW. The proposed alignment of the 115 kV HVTLs would require thirteen wetland crossings ranging in length from 33 feet to 333 feet. Because the maximum span length for this HVTL is 600 feet (+/- 100 feet for H-frame structures; Table 5), the wetland crossings would be spanned.

Table 14 Acres of Wetland within Routes/ROW

Eggers & Reed Wetland Type	Wetland (acres)	
	ROW	Route
Alder thicket/Shrub carr	3.88	10.48
Conifer swamp	0.48	2.23
Excavated pond	2.47	7.70
Hardwood swamp	6.92	14.17
Shallow open water	2.29	10.65
Wet/sedge meadow	1.95	3.16
Excavated - Shrub carr	0.29	0.91
Total acres	**18.28**	**49.29**

6.5.2.6 **Mitigative Measures**

The transmission line would be designed to span wetlands to the extent possible. However, it is possible that one or more structures would need to be placed within wetlands; any necessary permits would be obtained after design is completed. When it is not feasible to span the wetland, construction crews would use several methods to minimize impacts:

- when possible, construction would be scheduled to occur when the ground is frozen;
- crews would attempt to take the shortest route when they access the wetland;
- the structures would be assembled on upland areas before they are brought to the site for installation; and
- when construction during winter is not possible, construction mats would be used where wetlands would be affected.

The Applicant would design the proposed Project to avoid and minimize wetland impacts, and would apply erosion control measures identified in the Minnesota Pollution Control Agency (MPCA) Storm Water BMPs Manual, such as using silt fencing to minimize impacts to water quality.

As previously stated in 6.5.2.1, 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 proposed Project, the Applicant would obtain the permit and prepare a 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. The SWPPP would outline strategies and steps that would be taken to prevent nonpoint source pollution discharging from construction areas.

6.5.2.7 **Floodplain**

There are no floodplains in the proposed Project area.[13] See Figure B.5.

6.5.2.8 **Mitigative Measures**

No impacts to floodplain resources are anticipated; therefore, no mitigative measures are proposed.

6.5.3 Flora

The MnDNR Gap Analysis Program (GAP) Land Cover data set[14] was used to identify land cover types in the vicinity of the Project area. GAP land cover types within the routes and proposed Substation Location are shown on Figure B-3. Land cover is summarized in Table 15.

Table 15 Land Use/Land Cover within the 160 ft ROW

Landcover Type	Acres	Percent
Upland Shrub	68.48	32.0
Maple/Basswood	51.91	24.3
Aspen/White Birch	65.98	30.9
Developed	10.71	5.0
Grassland	6.94	1.8
Water	1.64	0.8
Spruce/Fir	1.64	0.8
Marsh	0.52	0.2
Lowland Shrub	3.17	1.5
Black Ash	5.77	2.7
Cropland	NA	0.0
Total	**213.77**	**100**

6.5.3.1 **Mitigative Measures**

Impacts to non-forested areas would be temporary and would primarily occur during construction of the proposed Project. To minimize impacts to trees in the Project area, the Applicants would limit tree clearing and removal to the transmission line ROW, areas that limit construction access to the Project area, and areas that impact the safe operation of the facilities. Trees outside the ROW that may need to be trimmed or removed would primarily include trees that are unstable and could potentially fall into the transmission facilities. The Applicant would work with and compensate landowners for removal of trees not in the ROW.

Construction equipment has the potential to spread noxious weed-propagating material to new locations. The Applicant would comply with Minnesota noxious weed laws as described in Minn. Stat. § 18.75 to 18.91 and avoid the transport of state prohibited noxious weeds as well as secondary noxious weeds on the Itasca County weed list. All areas disturbed by construction of the transmission lines would be reseeded using a native seed mix appropriate to the site.

6.5.4 Fauna

No MnDNR Wildlife Management Areas (WMA)[15] or USFWS Waterfowl Production Areas (WPA)[16] are located within the vicinity of the proposed Routes. However, the proposed Project crosses a variety of habitat for fauna that are commonly found in Northeast Minnesota. These species may include deer, small mammals, waterfowl, raptors, perching birds, amphibians, and others.

The primary potential impact presented to fauna by transmission lines is the potential injury and death of migratory birds such as raptors, waterfowl, and other large bird species. The electrocution of large birds, such as raptors, is more commonly associated with small distribution lines than large transmission lines. However, birds have the potential to collide with all elevated structures, including transmission lines. Avian collisions with transmission lines can occur in proximity to wooded areas, wetlands and water features, and along riparian corridors that may be used during migration.

Forest fragmentation is a form of habitat fragmentation, and occurs when forests are cut down and leave relatively small, isolated patches of forest known as forest fragments or forest remnants. Forest fragmentation and the subsequent habitat fragmentation can decrease biodiversity and could result in:

- the inability of individual forest fragments to support viable populations, especially of large vertebrates
- the local extinction of species that do not have at least one fragment capable of supporting a viable population
- edge effects that alter the conditions of the outer areas of the fragment, greatly reducing the amount of true forest interior habitat

The effect of fragmentation on the flora and fauna depends on a) the size of the remaining forest, and b) its degree of isolation. Isolation depends on the distance to the nearest similar patch of forest, and the contrast with the surrounding areas. For example, if a cleared area is reforested or allowed to regenerate, the increasing structural diversity of the vegetation will lessen the isolation of the forest fragments.

In the case of the proposed project, the entire ROW would be cleared during construction. Post-construction, the majority of the Project ROW would be allowed to naturally re-vegetate, however, large trees that could threaten the transmission line by falling would be periodically trimmed or removed. The project will result in minor, temporary forest fragmentation during construction but the effects would not be significant.

6.5.4.1 **Mitigative Measures**

Displacement of fauna is anticipated to be minor and temporary in nature, and no long-term population-level impacts are anticipated from the proposed Project. The Applicant would construct the transmission line according to Avian Power Line Interaction Committee (APLIC) recommended safety design standards regarding avian collisions and avian electrocution with HVTLs[16][17]. In addition, the Applicant would work with the MnDNR and the USFWS to identify any areas that may require marking

transmission line shield wires and/or using alternative structures to reduce the likelihood of avian collisions.

6.6 Rare and Unique Natural Resources

The USFWS list of federally threatened, endangered, proposed, and candidate species was reviewed[17][18] to obtain information on federally-listed species that could be present in the Project area. According to the USFWS list, Itasca County, where the proposed Project is located, is within the overall range of the Canada Lynx (*Lynx Canadensis*; federally threatened). If Canada Lynx are present it is unlikely the proposed Project would adversely affect them as it would not limit their movement.See Appendix B.

The Minnesota Natural Heritage Inventory System (NHIS) database was reviewed for state-listed threatened, endangered, and special concern species that have been documented within on mile of the proposed Project. There are records of state-listed plant species within the project area and within one mile of the project as shown in Figure B.4. The Applicant will submit a Survey Work Plan to the MnDNR for review and comment. A survey for rare plant species would be completed within the proposed Project area to determine the location of rare plants in accordance with the Survey Work Plan and modifications requested by the MnDNR, if any.

6.6.1.1 **Mitigative Measures**

If state-listed threatened or endangered species are found during rare plant surveys, the Applicant would coordinate with the MnDNR to avoid impacts or to obtain a permit for unavoidable impacts. Potential avoidance measures for state-listed plan species may include the establishment of exclusion areas to reduce clearing activities near the plants, modifications to pole locations, etc.

7.0 Agency Involvement, Public Participation and Required Permits and Approvals

7.1 Project Notices to Agencies, LGUs, and Interested Parties

All scoping materials can be found in Appendix C. On August 30, 2013, Minnesota Power submitted pre-filing notice letters to the Local Governmental Unit (LGU) within the Project area to provide the LGU notice of the proposed Project, requesting comments and concerns, and allowing the LGU the opportunity to request a meeting to discuss the proposed Project. This LGU letter is included in Appendix D.

On September 6, 2013, Minnesota Power sent notice letters describing the proposed Project, requesting comments, and announcing a public informational meeting scheduled for September 26, 2013 to pertinent federal and state agencies, local government units, and nearby landowners (**Error! Reference source not found.**). A notice for the public informational meeting was published in the Scenic Range News Forum on September 19, 2013, the Scenic Range News Forum on September 19, 2013 and the Mesabi Daily News on Weekday, September 19, 2013. See Appendix C.

The public informational meeting was held on September 26, 2013 from 6:00 to 7:30 p.m. at the Bovey City Hall in Bovey to inform landowners and public officials of the proposed Project and to gather input to be used in further assessing Project impacts. Two people attended the meeting. A copy of the notice letter, newspaper notice, and open house attendee list is included in **Error! Reference source not found.**.

7.2 United States Fish and Wildlife Service

On September 6, 2013, Barr, on behalf of Minnesota Power, sent a letter to USFWS requesting review of the proposed Project. At present no comments have been received.

7.3 Minnesota Department of Natural Resources

On September 6, 2013, Barr, on behalf of Minnesota Power, sent a letter to MnDNR requesting review of the proposed Project. The MnDNR responded on October 4, 2013, voicing concerns about the proposed Project's impact on future access to iron resources (see Section 6.3.4). This response is included in Appendix C.

7.4 Minnesota State Historic Preservation Office

The Applicant is consulting with the Minnesota State Historic Preservation Office (SHPO) and will comply with Section 106 for the project. At the SHPO's request, an archaeological study will be conducted prior to construction. See Section 6.4.

7.5 Identification of Landowners

A list of landowners is included in Appendix C. Addresses have been redacted from the landowner list and comment forms due to privacy concerns.

In addition to a Route Permit, other Federal, State, and local permits could potentially be required for the proposed Project. These are identified below inTable 16Potential Permits Required

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Table 16 Potential Permits Required

Permit	Jurisdiction
Federal	
Section 404 Jurisdictional Determination/Permit	U.S. Army Corps of Engineers (ACOE)
State	
Route Permit	MPUC
Utility Permit	MnDOT
NPDES Construction Stormwater Permit	MPCA
Section 401 Water Quality Certification	MPCA (required if the ACOE requires an individual permit for wetland dredging and filling activities, this certification is required)
Local	
Minnesota Wetland Conservation Act Certification	Itasca County

For the other permits listed in **Table 16Potential Permits Required**

, and any additional permit requirements identified during subsequent agency consultations, the Applicant will acquire the necessary authorizations and develop the appropriate plans associated with any permit or authorization (e.g., stormwater pollution prevention management plan prior to construction).

7.5.1 Federal Permits

7.5.1.1 U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (ACOE) regulates the placement of fill material into wetlands that are located adjacent to, or hydraulically connected to, interstate or navigable waters under the authority of Section 404 of the Clean Water Act. After coordination and application submission, authorization from the ACOE would likely fall under the utility line discharge provision of a Regional General Permit (RGP-3-MN) which provides for utility line discharges. Notification would be required because the proposed Project would cross more than 500 feet of wetland and require direct fill for placement of structures in wetlands.

7.5.2 State of Minnesota Permits

7.5.2.1 Minnesota Public Utilities Commission

Minn. Stat. § 216E.03, subd. 2, provides that no person may construct a HVTL without a Route Permit from the Commission. The Applicant is seeking a Route Permit from the Commission with this Application.

7.5.2.2 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 Minn. Stat. § 84.415 and Minn. R., chapter 6135. 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 for the proposed Project.

7.5.2.3 Minnesota Pollution Control Agency

MPCA requires an NPDES construction storm water permit and SWPPP 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. The MPCA may also require the proposed Project to have an individual NPDES/SDS construction storm water permit. Most construction activities are covered by the general NPDES storm water permit for construction activity. Individual NPDES/SDS permits may be required for very large projects or projects that have a high potential to impact environmentally sensitive areas. The Applicant would determine if their project exceeds the one acre threshold, and, if so, obtain the permit or notice of permit coverage from the MPCA. The MPCA would notify the Applicant if they would need to obtain an individual NPDES/SDS permit for their project.

7.5.3 Local Permits

Once the Commission issues a Route Permit, zoning, building and land use regulations and rules are preempted per Minn. Stat. § 216E.10, subd. 1. Applicable permits from Itasca County concerning road access, road ROW, and wetlands under Minnesota Wetland Conservation Act (WCA) will be secured as needed for the proposed Project.

8.0 References

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[16] US Fish and Wildlife Service, Waterfowl Protection Area Mapper http://gis.fws.gov/WPA_Mapper/. [Accessed September 2013]

[17] Avian Power Line Interaction Committee, *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006,* Washington, D.C. and Sacramento, CA: Edison Electric Institute, APLIC, and the California Energy Commission, 2006.

[18] United States Fish and Wildlife Service, "County Distribution of Minnesota’s Federally Threatened, Endangered, and Candidate Species," 2013. [Online]. Available: http://www.fws.gov/midwest/endangered/lists/minnesot-cty.html. [Accessed January 2013].

9.0 Definitions

Following are a list of definitions used in this Application:

Avian	Of or relating to birds.
A-weighted Scale	The sensitivity range for human hearing.
Breaker	Device for opening a circuit.
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.
Electric Field (EF)	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 Fields (EMF)	The term EMF refers to electric and magnetic fields that are coupled together, such as in high frequency radiating fields. For the lower frequencies associated with power lines, EMF should be separated into electric and magnetic fields. Electric and magnetic fields arise from the flow of electricity and the voltage of a line. The intensity of the electric field is related to the voltage of the line. The intensity of the magnetic field is related to the current flow through the conductors.
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.
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 69 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 Field (MF)	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.
Neutral to Earth Voltage (NEV)	The term NEV is used to describe a measurable level of voltage which may occur between a metal object and the adjacent floor or earth.
Oxide	A compound of oxygen with one other more positive element or radical.
Ozone	A form of oxygen in which the molecule is made of three atoms instead of the usual two.

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	"Stray voltage" is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage 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.
Ultraviolet Radiation	A portion of the electromagnetic spectrum with wavelengths shorter than visible light.
Voltage	Electric potential or potential difference expressed in volts.
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.

10.0 Acronyms

AC	Alternating Current
ACOE	U.S. Army Corps of Engineers
ALJ	Administrative Law Judge
Applicant	Minnesota Power
Application	Route Permit Application
Barr	Barr Engineering Company
BMP	Best Management Practice
Brookings Project	Brookings County – Hampton 345 kV Route Permit proceeding
CEF	Considered Eligible For (listing in the National Register)
Commission	Minnesota Public Utilities Commission
Company	Northern States Power Company
dBA	A-weighted sound level in decibels
ECS	Ecological Classification System
EF	Electric Field
ELF	Extremely Low Frequency
EMF	Electric and Magnetic Fields
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GAP	Gap Analysis Program
GIS	Geographic Information System
HVTL	High Voltage Transmission Line
kV	Kilovolt
kV/m	Kilovolts Per Meter
L	Level Descriptors or Statistical Sound Levels
L_{10}	the dBA that may be exceeded 10 percent of the time within an hour
L_{50}	the dBA that may be exceeded 50 percent of the time within an hour
LGU	Local Government Unit
MF	Magnetic Field
mG	milliGauss
MnDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
NAC	Noise Area Classification
NESC	National Electric Safety Code
NEV	Neutral to Earth Voltage
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NWI	National Wetlands Inventory
ppm	parts per million
PPSA	Power Plant Siting Act
Project	Minnesota Power Canisteo HVTL and Substation Project
PWI	MnDNR Public Water Inventory
RGP	Regional General Permit
SHPO	Minnesota State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan

USFWS	United States Fish and Wildlife Service
VOR	Very-High-Frequency Omni-Directional Range
WCA	Wetland Conservation Act
WMA	Wildlife Management Area
Working Group	Interagency Working Group
WPA	Waterfowl Production Area