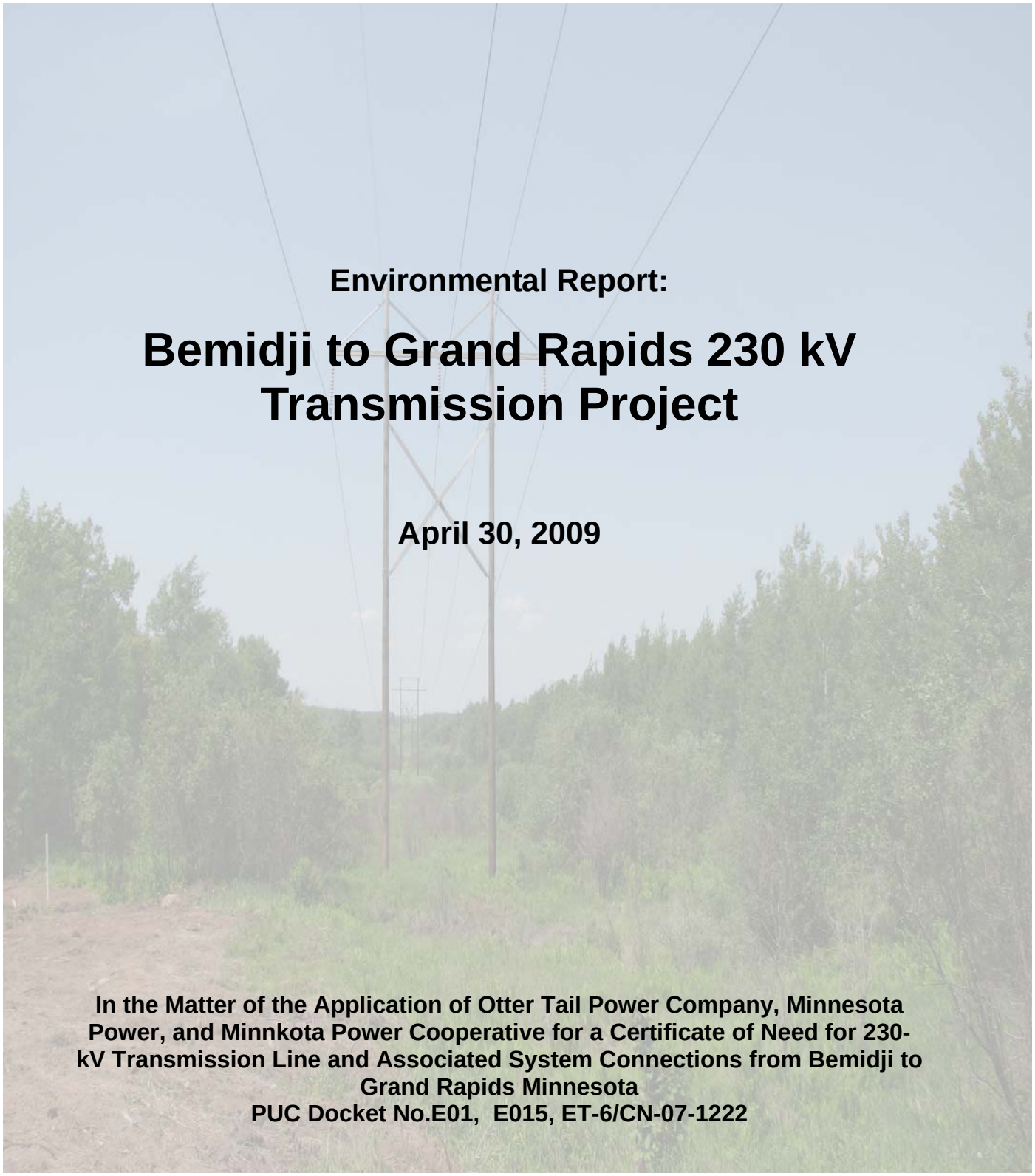

Environmental Report:

Bemidji to Grand Rapids 230 kV Transmission Project

April 30, 2009

In the Matter of the Application of Otter Tail Power Company, Minnesota Power, and Minnkota Power Cooperative for a Certificate of Need for 230-kV Transmission Line and Associated System Connections from Bemidji to Grand Rapids Minnesota
PUC Docket No.E01, E015, ET-6/CN-07-1222

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Abstract

On March 17, 2008, Otter Tail Power Company, Minnesota Power, and Minnkota Power Cooperative (Applicants) applied for a Certificate of Need (CON) from the Minnesota Public Utilities Commission (Commission) to build the proposed Bemidji – Grand Rapids 230 kV Transmission Project (Project). The application was accepted as complete by the Commission on July 22, 2008.

The Project is a Large Energy Facility as defined by Minnesota Statute 216B.2421 and requires a CON from the Minnesota Public Utilities Commission. The Project also will require a route permit, which will be reviewed by the Commission in a separate proceeding under Docket 07-1327.

An Environmental Report (ER) is required for the CON. The Department of Commerce is responsible for the preparation of this report under Minnesota Rules 7849.7010-7110. On March 3, 2009, Office of Energy Security (OES) Director William Glahn issued the scoping decision determining alternatives and items to be addressed in the ER. The Scoping Order is available in Appendix A.

Public hearings will be held in the project areas from May 20-21, 2009. The hearings will be presided over by Administrative Law Judge Beverly J. Heydinger.

Persons interested in additional information regarding the environmental review in this matter can contact Suzanne Lamb Steinhauer, Energy Facilities Permitting, 85 7th Place East, Suite 500, St. Paul, Minnesota 55101, (651) 296-2888 or suzanne.steinhauer@state.mn.us. Interested persons can also be added to the project mailing list by registering their names on the project

docket webpage at http://energyfacilities.puc.state.mn.us/Docket.html?Id=19344 . Documents in the record are available at eDockets at https://www.edockets.state.mn.us/EFiling/search.jsp; enter 07-1222 to search. For other information, please contact Commission staff person Bret Eknes, Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN 55101, (651) 201-2236 or bret.eknes@state.mn.us.

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Acronyms

BWSR	Board of Water and Soil Resources
CON	Certificate of Need
dBA	A-weighted sound level recorded in units of decibels
DNR	Department of Natural Resources
ER	Environmental Report
EIS	Environmental Impact Statement
EFP	OES Energy Facilities Permitting
ERP	OES Energy Regulation & Planning
EMF	Electromagnetic Field
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
G	Gauss (mG = milligauss)
HAP	Hazardous Air Pollutant
HVTL	high voltage transmission line
Hz	Hertz
kV	Kilovolt
kW	Kilowatt (kWh= kilowatt hour)
MNDOT	Minnesota Department of Transportation
MW	Megawatt
MWh	megawatt hour
MPCA	Minnesota Pollution Control Agency
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NIEHS	National Institute of Environmental Health Sciences
NPDES	National Pollutant Discharge Elimination System
NWI	Nation Wetlands Inventory
OES	Office of Energy Security (Department of Commerce)
PWI	Public Waters Inventory
ROW	right-of-way
RUS	U.S. Department of Agriculture Rural Utilities Service
SNA	Scientific and Natural Area
SWPPP	Stormwater Pollution Prevention Plan
USFWS	U.S. Fish and Wildlife Service
WMA	Wildlife Management Area

TABLE OF CONTENTS

Abstract 1
Acronyms 3
1.0 Introduction 1
1.1 Project Purpose 2
1.2 Project Description 3
1.3 Project Design 3
1.4 Project Construction and Maintenance 4
1.5 Project Schedule and Cost 5
2.0 Project Impacts and Mitigations 7
2.1 Potential Impacts on Human Settlement 8
2.1.1 Socioeconomics 8
2.1.2 Displacement 10
2.1.3 Noise 10
2.1.4 Aesthetics 13
2.1.5 Radio and Television Interference 14
2.1.6 Archaeological and Historic Resources 16
2.1.7 Human Health and Safety 17
2.2 Potential Impacts on Land-based Economies 25
2.2.1 Recreation 25
2.2.2 Agriculture 26
2.2.3 Transportation 27
2.2.4 Mining 28
2.2.5 Forestry 28
2.2.6 Hunting and Gathering 29
2.2.7 Economic Development 30
2.3 Potential Impacts on Natural Environments 31
2.3.1 Air Quality 31
2.3.2 Water Quality 32
2.3.3 Soils and Geology 34
2.3.4 Flora and Fauna 35
2.3.5 Natural Resources of Special Concern 37
3.0 System Alternatives 39
3.1 No-Build Alternative 40
3.1.1 Human and Environmental Impacts 40
3.1.2 Feasibility and Availability 41

3.2 Transmission System Alternative 41
3.2.1 Human and Environmental Impacts 42
3.2.2 Feasibility and Availability 42
3.3 Generation Alternative 43
3.3.1 Human and Environmental Impacts 45
3.3.2 Feasibility and Availability 46
4.0 Regulatory Framework 49
4.1 Certificate of Need 49
4.2 Route Permit 51
4.3 Other Required Permits and Approvals 53
4.3.1 Local Approvals 53
4.3.2 Other State of Minnesota Approvals 53
4.3.3 Federal Approvals 54
4.4 Environmental Review 55
Environmental Report Resource Materials 57
Appendix A. Commissioner's Scoping Decision 59
Appendix B. Environmental Review Maps 60
Figure B-1: Project Area
Figure B-2: Study Area
Figure B-3: Surface Waters
Figure B-4: Land Cover
Figure B-5: Parks, Trails, and Natural Areas
Appendix C. Figures 61
Figure C-1: H-Frame Structure
Figure C-2: Single-Pole Single Circuit Structure
Figure C-3: Single Pole Double Circuit Structure

LIST OF TABLES

Table 2-1 MPCA Noise Standards (dBA – Decibel, A-weighted) 11
Table 2-2 Transmission Lines - Expected Noise Calculations 12
Table 2-3 Proposed Structure Types 13
Table 2-4 Estimated Electric Fields (kV/meter) 19
Table 2-5 Estimated Magnetic Fields (milligauss) 20
Table 2-6 Magnetic Fields (milligauss) From Common Home and Business Appliances 21
Table 2-7 International Commission on Non-Ionizing Radiation Protection 24
Guidelines for 60 Hz EMF Exposure 24
Table 3-1 Combustion Turbine Plants Used in Generation Alternative Comparison 44
Table 3-2 Facilities Potential to Emit as per MPCA Permits (tons/year) 46
Table 4-1 Required Permits or Approvals 49

1.0 Introduction

On March 17, 2008 Otter Tail Power Company, Minnesota Power, and Minnkota Power Cooperative (Applicants) made a joint application to the Minnesota Public Utilities Commission (Commission) for a Certificate of Need (CON) for a 230 kV Transmission Line and Associated System Connections from Bemidji to Grand Rapids (Project). The PUC docket number for this proceeding is E017, E015, ET-6/CN-07-1222. The Commission accepted the application on July 22, 2008.

The Project would be a "large energy facility" as defined by Minnesota Statute 216B.2421. In accordance with Minnesota Statute 216B.243, no large energy facilities may be sited or constructed in Minnesota without issuance of a CON by the Commission.

The Minnesota Department of Commerce Office of Energy Security (OES) performs environmental review on applications for certificate of need for large energy facilities. The Commission is the final decision-making body in these matters. This Environmental Report (ER) document covers the environmental review requirements for the large energy project certificate of need determination identified in Minnesota Rule 7849.7010 – 7110.

Under the above rules, the OES is required to schedule at least one public meeting in the area of the proposed Project. The purpose of the meeting is to advise the public of the Project and to solicit public input into the scope of the environmental review. A "scope" is a determination of what needs to be assessed in the environmental review in order to fully inform decision-makers and the public about the possible impacts of a project or potential alternatives.

The OES Energy Facilities Permitting (EFP) unit held public information meetings in the Project area in August, 2008. Approximately 120 people attended the public information meetings. In addition to the oral comments received at the public information meetings, more than 120 written comments were received by the close of the public comment period on September 30, 2008. Following the close of the comment period, EFP staff reviewed the public comments on the scope of the environmental review and the rules governing the content of an ER (7849.7060). Based on that review, the Director of the OES issued a Scoping Decision on March 3, 2009. The Scoping Decision is included in Appendix A of this ER.

This ER addresses the issues identified in the scope in four different sections: Section I presents introductory discussions of the Project as proposed by the Applicants; Section II addresses

general impacts and mitigations for environmental issues based on the size, type and timing of the proposed project within the study area; Section III reviews system alternatives that may have the capability to alleviate the need for all or some of the Project; and finally, Section IV reviews the regulatory framework under which the Certificate of Need application is proceeding.

In addition to the CON Application, the Applicants have also applied to the Commission for a route permit for the Project. If issued by the Commission, a route permit would identify the location of the route as well as any conditions pertaining to the construction or operation and maintenance of the Project. The routing process includes preparation of an Environmental Impact Statement (EIS) and is proceeding under a separate docket (E017, E015, ET-6/TL-1327).

1.1 Project Purpose

The Project is intended to meet the projected future electric customer demand and maintain the reliability of the transmission system in the Bemidji area in north central Minnesota. The Bemidji area (shown in Figure B-1) includes the communities of Bagley to the west, Walker to the south, and Blackduck to the northeast, as well as a large portion of the Leech Lake Reservation. In addition to meeting the future needs of the Bemidji area, the Project is intended to maintain regional transmission reliability for the larger northwestern Minnesota and eastern North Dakota region.

The Bemidji area is currently served by three transmission lines (the Winger – Wilton 230 kV line, the Winger-Bagley-Solway-Wilton 115 kV line, and the Badoura-Akely-Bemidji-Wilton 115 kV line) and one generator (Otter Tail Power's 40 megawatt (MW) Solway Generating Station).

The area is susceptible to low voltage conditions if the Winger – Wilton 230 kV transmission line is out of service during winter peak load conditions. The electric power demand in the Bemidji area is growing at a rate of approximately 2 percent per year. Although interim measures to improve the electric transmission system have been taken, such as adding voltage support, the peak load is anticipated to reach 296 MW by the winter of 2011-2012, or approximately 76 MW greater than the system's maximum load-serving capability of 220 MW. The Applicants estimate peak load to reach approximately 360 MW by winter 2022-2023. Without improvements to address this deficit, the area would be in a situation of local load-serving inadequacy, meaning that in the event of the loss of local transmission capability, the area could be subject to brownouts or blackouts.

As proposed, the Project will also facilitate the addition of new generation sources in the region. Specifically, portions of the Red River Valley and eastern North Dakota have been

identified as areas for the potential development of wind-energy generation sources and the added transmission capacity from the Bemidji–Grand Rapids Line will assist in the development of such resources.

1.2 Project Description

The Applicants propose constructing a 230 kV line from Minnkota Power's 230 kV Wilton Substation located just west of Bemidji, Minnesota, to Minnesota Power's 230 kV Boswell Substation in Cohasset, Minnesota, northwest of Grand Rapids, Minnesota. While final engineering and design has not been completed, the Applicants propose to use two-pole, H-frame structures for a majority of the line; these structures are typical for a 230 kV line located on wooded, rugged topography with wetlands. Where conditions warrant it, single-pole construction may be used. In addition to the transmission line, the Project would also include upgrades to both the Wilton and Boswell substations. Depending upon the route selected, the Project may also either expand the existing Cass Lake Substation or construct a new substation in the Cass Lake area.

1.3 Project Design

High voltage transmission line circuits generally consist of three phases, each at the end of a separate insulator string, and physically supported by structures. A phase consists of one or more conductors.

A conductor is a cable typically less than one inch in diameter consisting of multiple strands of steel and aluminum wire wound together. There are also two shield wires strung above the phases to prevent damage from potential lightning strikes. The shield wire may also include a fiber optic cable that allows for substation protection equipment to communicate with other terminals on the line. A double-circuit transmission line thereby carries two circuits or six phases and typically two shield wires.

There are a number of different types of structures used to support transmission lines including single steel pole structures and H-frame structures. The transmission lines are constructed on a right-of-way. The width of a right-of-way (ROW) depends on the structure design, the height of the structure, the span length between structures and the amount of voltage associated with the transmission line.

Conductors

The Applicants propose using a 954 kcmil aluminum conductor settle reinforced (ACSR), with a capacity of approximately 470 mega volt-ampere (MVA), for the each phase of the 230 kV

circuit. The conductor size may be modified once the ultimate route is selected and additional electrical optimization studies are completed. The applicants propose to use a 3/8 inch diameter extra high strength steel and fiber optic ground wire for the shield wires.

Structures

The Applicants propose to use H-frame 230 kV structures, as seen in Figure C-1, for the majority of the Project. Each H-Frame structure would average from 70 to 90 feet high with spans of 600 to 1,000 feet between structures. Single-pole davit-arm structures, as seen in Figure C-2, may be used for areas where available ROW is limited. Single-pole davit-arm structures would average 80 – 100 feet high with spans of 400 to 800 feet between structures.

The Applicants propose to use single-pole self-supporting structures set on reinforced concrete drilled shaft foundations, as seen in Figure C-3, for any double-circuit portions of the Project. These structures would average 95 – 115 feet in height, with spans of 350 – 700 feet between structures.

Right-of-Way

The right-of-way for the proposed 230 kV transmission line would be approximately 125 feet, or 62.5 feet either side of a centerline.

1.4 Project Construction and Maintenance

The engineering, construction and maintenance of a transmission line usually begins with the Applicant working with landowners to secure easements for the right-of-way and the actual construction of the line. These activities typically occur after a route permit is issued. The route permit will identify a variety of mitigation measures to minimize impacts from the Project. Additional mitigation measures may also be required by a variety of other permits required by the project (identified in Table 4-1).

The Applicant would need to contact the selected landowners and work with them closely during all phases of the construction phase of the project. The Applicant would contact the landowner to obtain permission for geological surveys and testing, securing property rights necessary to build and operate/maintain the transmission line. In addition, arrangements are made to coordinate the placement of gates or other access needs. Finally agreements are made during and after construction to address and compensate for any potential damage that may have occurred.

The construction process consists of multiple distinct steps performed in an orderly sequence to ensure efficient, safe, and timely completion. Surveying is performed to determine structure foundations and trees/vegetation that may need to be cleared. Structure foundations are drilled with large drill rigs. Depending on the engineering and geology structures that may be encountered, a concrete foundation may be buried directly in the soil. Large cranes are used to erect the transmission line structures. Transmission line stringing equipment is typically set up at each end of the segment in two mile increments. Upon completion of the construction process the designated right-of-way is restored.

Transmission lines are typically inspected from the air on a monthly basis and on the ground annually. Depending on the type of trees and vegetation present, the vegetation management schedule is usually conducted in five to ten year cycles.

1.5 Project Schedule and Cost

The construction of this 230 kV line is estimated to be in the range of $675,000 to $915,000 per mile in 2007 dollars (excluding right-of-way, permitting, and other ancillary costs). Based on the proportion of wooded and wetland terrain in the project area, the cost per mile is estimated to be on the high end of the range. Based on the route selected, the total cost of the transmission line is anticipated to be between $58.1 million and $96.6 million, with another $2.5 million estimated to upgrade the Wilton and Boswell substations. Depending upon the route selected, the Project may also either expand the existing Cass Lake Substation or construct a new substation in the Cass Lake area. These alternatives would add approximately $ 5.2 – 8.4 million to the cost. The cost for the Project is estimated at $ 60.6 - 99.1 million.

The Applicants anticipate that the Project will be in-service in December 2011.

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2.0 Project Impacts and Mitigations

This section addresses general impacts and mitigations for high voltage transmission lines, based on the size, type and timing of the project and general characteristics of the study area. Impacts and mitigations related to specific routes evaluated as part of the route permitting process will be addressed in the EIS being prepared as part of the route permit process in Docket TL-07-1327.

The study area (shown in Figure B-2) incorporates two corridors between the Wilton and Boswell substations where the Applicants and agencies believe that a transmission line could be routed, provided the need is determined. These corridors contain three routes being evaluated in the EIS being prepared as part of the routing process in Docket TL-07-1327. The Applicants' preferred corridor, identified in the section 1.4 of the CON Application, is generally centered along Highway 2, although it incorporates a larger area on both the western and eastern ends. In response to concerns voiced by the Chippewa National Forest and Leech Lake Band of Ojibwe, the Applicants also identified three additional corridors between these two endpoints, see Section 6.1 of the Application. After reviewing public and agency comments, the OES director determined that two of the corridors, covering areas to the south of the Applicants preferred corridor, appeared to offer no significant advantage over the Applicants' preferred corridor. One corridor, running northeast from Bemidji towards Blackduck, then west for approximately 35 miles before turning south to Deer River and then southeast to the Boswell Substation, did appear to offer some potential advantages to the corridor containing the routes proposed by the Applicants, and would provide a different set of land uses for the Commission to review. Based on this analysis, the OES director included a route within this corridor for study in the EIS. Because of the potential that a route in this corridor could be selected by the Commission in its route permit determination in Docket TL-07-1327, this corridor is included in the study area.

Minnesota Rule 7849.7060 defines the issues which must be included in the environmental report; these include an analysis of the human and environmental impacts of the proposed project and an analysis of the mitigative measures that could reasonably be implemented to reduce or eliminate the identified impacts. This section will examine those potential impacts and mitigations for issues affecting:

- Human Settlement: analyzing the impacts that might affect the people living alongside a transmission installation;

- Land-based Economies: examining possible effects of a high voltage transmission line on agriculture, businesses and economic development in the areas of interest; and
- Natural Environments: reviewing issues that might affect air quality, water, wildlife and areas of special environment concern.

2.1 Potential Impacts on Human Settlement

This section looks at how the Project would interact with the existing population in the proposed study area. Population density in the study area is generally low, characterized by scattered or clustered rural residences with greater density in the cities of Bemidji, Cass Lake, Bena, Ball Club, Deer River, Black Duck, and Cohasset.

The Project would have short-term impacts related to construction. Long-term impacts would include maintenance of electric reliability as well as aesthetic changes resulting from installation of the line and tree clearing.

2.1.1 Socioeconomics

The direct socioeconomic impacts of transmission lines generally fall into construction phase and long term operational impacts.

Construction

During the construction phase, impacts to social and economic resources are expected to be short-term in nature. Construction phase spending in the host communities may increase revenue for some local businesses. Hotels, restaurants, gas stations and grocery stores will likely cater to crews working on the transmission lines. Other local businesses, such as excavation contractors, ready-mix concrete and gravel suppliers, hardware stores, welding and machine shops, packaging and postal services and heavy equipment repair and maintenance service providers may benefit by supplying materials and services during the construction phase. Impacts to social services would likely be minimal due to the short-term nature of construction activities. Construction crews are estimated to be approximately 75 personnel in total for the Project. In the event of unanticipated delays prior to commencement of construction, additional construction personnel may be required to meet an accelerated schedule to get the Project online by the end of 2011.

The Applicants do not anticipate that any new permanent jobs will be created as a result of the Project. Long-term beneficial impacts from the Project include increased local tax base resulting from the incremental increase in revenues from utility property taxes.

Property Values

One of the first concerns of many residents near existing or proposed transmission lines is how proximity to the line could affect the value of their property. Research on this issue does not identify a clear cause and effect relationship the two. Instead, the presence of a transmission line becomes one of several factors that interact to affect the value of a particular property.

The Wisconsin Public Service Commission addressed the issue of changes in property value associated with high voltage transmission lines in their Final Environmental Impact Statement on the Arrowhead – Weston Electric Transmission Line Project. Their analysis of the relationship between property values and transmission lines looked at approximately 30 papers, articles and court cases covering the period from 1987 through 1999.

The Wisconsin analysis identified two types of property value impacts that property owners may experience: potential economic impact associated with the amount paid by a utility for a ROW easement, and potential economic impact regarding the future marketability of the property.

The Final EIS provides six general observations from the studies it evaluated. These are:

- The potential reduction in sale price for single family homes may range from 0 to 14 percent.
- Adverse effects on the sale price of smaller properties could be greater than effects on the sale price of larger properties.
- Other amenities, such as proximity to schools or jobs, lot size, square footage of a house and neighborhood characteristics, tend to have a much greater effect on sale price than the presence of a power line.
- The adverse effects appear to diminish over time.
- Effects on sale price are most often observed for property crossed by or immediately adjacent to a power line, but effects have also been observed for properties farther away from the line.
- The value of agricultural property is likely to decrease if the power line poles are placed in an area that inhibits farm operations.

Electric Reliability

The Project is intended to allow utilities to meet the growing demand for electric power in the Bemidji area and to maintain transmission system reliability in northwestern Minnesota and

eastern North Dakota. Potential impacts to electric reliability on a regional and local basis are anticipated to be positive.

Mitigations

Socioeconomic impacts resulting from construction of the Project would be primarily positive with an influx of wages and expenditures made at local businesses and continued electric reliability.

In the matter of property values, compensation for potential impacts would typically be negotiated in an easement agreement between the Applicants and the landowner.

2.1.2 Displacement

The National Electric Safety Code (NESC) requires certain clearances between transmission line facilities and buildings for safe operation of the transmission line. The applicants would acquire rights-of-way for each project sufficient to maintain clearances required to safely operate the transmission lines.

In the event that a structure is located within the right-of-way required for a new transmission facility, that structure would be displaced; meaning the property would need to be purchased by the utility and removed from the area.

Mitigations

Identification of specific locations where displacement may occur and analysis of specific impacts resulting from the displacement will occur within the route permitting process.

Displacement resulting from a transmission project in Minnesota is quite rare. Instances requiring displacement have been minimized by routing transmission to avoid structures, especially homes and businesses, to the extent possible. In the event that a particular route would require the removal of a structure, payment for the value of the lost property would be negotiated between the property holder and the utility.

2.1.3 Noise

Transmission conductors and transformers at substations produce audible noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions. In foggy, damp, or rainy weather conditions, power lines can create a subtle crackling sound due to the small amount of the electricity ionizing the moist air near the wires. During heavy rain the general background noise level is usually greater than the noise

from a transmission line. During light rain, dense fog, snow, and other times when there is moisture in the air, the proposed transmission lines will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is a nearly imperceptible, sporadic crackling sound. Transformers are the primary producers of noise at substations.

The Minnesota Pollution Control Agency (MPCA) noise regulations, Minnesota Rule 7030.0050, list various activity categories by Noise Area Classification.[1] Table 2-1 below identifies the established noise standards for daytime and nighttime for each classification. The standards are expressed as a range of dBA (decibel – A weighted) within a one hour period; L_{50} is the dBA that is exceeded 50 percent of the time within an hour, while L_{10} is the dBA that is exceeded ten percent of the time within the hour.

Table 2-1 MPCA Noise Standards (dBA – Decibel, A-weighted)

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

The audible noise levels of a transmission line depend significantly on a variety of characteristics: prevailing weather conditions, the line's geometry and operating voltage. The audible noise of a 230 kV line during fair weather would be expected to be very low and seldom noticed, even if one is standing directly under the line. The audible noise of any transmission line is greatest during heavy rain when the conductor is wet. Table 2-2 shows estimates for expected noise measurements at the edge of the ROW for different structure types. These estimates were calculated by the Applicants using transmission line noise level algorithms developed by the Bonneville Power Administration.

[1] http://www.pca.state.mn.us/programs/pubs/noise.pdf

Table 2-2 Transmission Lines - Expected Noise Calculations

Voltage	Structure Type	Noise at Edge of ROW (dBA)		
		Fair Conditions	Wet Conditions L5	Wet Conditions L50
230 kV	Single Pole Davit Arm	16.5	45.0	41.5
	H-Frame	15.4	43.9	40.4
230 kV / 115 kV Double-circuit	Single Pole Davit Arm	17.6	46.1	42.6
230 kV/ 69 kV Double-circuit	Single Pole Davit Arm	17.3	45.8	42.3

Because the Project will not be adding any transformers to either the Wilton or Boswell substations, no additional noise impacts are estimated from substation improvements to those sites.

Depending upon the route selected, the Cass Lake Substation may be expanded or a new substation may be constructed. In either case, the improvements would include a 230/115 kV transformer.

Additional analysis of noise impacts and mitigation measures will be addressed in the EIS prepared for the routing proceedings (Docket TL-07-1327).

Mitigations

HVTL permits issued by the Commission typically include a condition that requires the Project to meet Minnesota noise standards. Specific mitigation measures can be addressed during the routing process, once impacts are better known.

Noise impacts associated with construction can be mitigated by limiting the hours of work to daytime hours. Heavy equipment used in construction can be equipped with sound attenuation devices such as mufflers to minimize the daytime noise levels.

The primary noise mitigation strategy for reducing noise from HVTLs is by routing the lines away from sensitive noise receptors to the extent possible.

Noise impacts from substations can be mitigated through substation design. In some cases, additional land beyond that required for the footprint of the substation may be acquired to

ensure sufficient setbacks from sensitive noise receptors. Other design measures include layout and landscaping to increase noise attenuation to nearby receptors. Low noise transformers can be used to reduce noise generation from substation equipment.

2.1.4 Aesthetics

The study area consists of a mixture of forested areas, with areas of residential settlement and agriculture. The area is also crossed with transportation corridors: forest roads, Highway 2, residential streets and township roads.

The Project's transmission lines and structures will contrast with existing land uses, causing an incremental visual impact. The Project would require crossing of the Mississippi river, as well as several other streams. There are no state-designated Wild and Scenic rivers in the study area. Portions of the project would cross through the Chippewa National Forest. The Chippewa National Forest's forest plan has identified areas of high scenic value within the study area.

Several types of transmission structures are under consideration for the proposed projects due to the variety of topographies expected to be encountered. (They are described in Table 2-3 below.)

The proposed lines and ROW will likely be visible to many residents located near the transmission lines as well as those traveling on highways, county, township and forest roads. The crossing will also likely be visible at two crossings of the Mississippi River, one as the Project leaves the Bemidi area and another as the Project approaches the Boswell Substation.

Table 2-3 Proposed Structure Types

Line Type	Structure Type	Structure Material	ROW Width (feet)	Structure Height (feet)	Pole Diameter (inches)	Distance Between H-Frame Poles (feet)	Span Between Structures (feet)
230 kV Single-Circuit	Single Pole Davit Arm	Steel	125	80 - 100	54 -72	n/a	400 -800
	H-Frame	Wood	125	70 90	24 – 36	19.5	600 – 1,000
230 /115 kV Double-Circuit	Single Pole Davit Arm	Steel	125	95 - 115	72 - 96	n/a	350 - 700
230 /69 kV Double-Circuit	Single Pole Davit Arm	Steel	125	95 - 115	72 - 96	n/a	350 - 700

Aesthetic impacts associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327).

Mitigations

Minnesota Rule 7849.5930 generally prohibits transmission line routing within several types of protected lands including national parks, state parks, national wilderness areas, and state scientific and natural areas (SNAs). These land uses are generally associated with scenic areas worthy of protection. These issues would be revisited in any transmission line routing proceeding.

In general and where practicable, new HVTLs are routed parallel to existing transmission, road or distribution ROWs which helps to minimize new visual disruptions to the landscape. Practices such as placing two transmission lines on a common structure (double-circuit) or placing distribution lines on a common transmission structure (underbuild) can limit or reduce the amount of total ROW needed and visual impact of the proposed transmission lines. Locating river crossings near existing transmission lines, highways or other infrastructure can minimize visual intrusion from the proposed Project.

The type of structures selected can help reduce the aesthetic impact from the proposed project, either by reducing the number of transmission structures required or by using structure types that reduce the contrast between the project setting and the transmission line.

Aesthetic impacts can be mitigated by minimizing tree clearing. In many cases low-growing shrubs or other vegetation can be planted in the ROW to blend the difference between the ROW and adjacent wooded areas. In some instances, planting or maintaining a vegetated screen between the substation or transmission line and sensitive features such as homes or scenic areas may also minimize the visual intrusion from the proposed Projects.

2.1.5 Radio and Television Interference

"Radio Noise" is a term used to refer to any unwanted interference of an electromagnetic nature with any signal or communication channels throughout the radio frequency band of operation, 3 kilohertz (kHz) to 30,000 kHz.

Corona-generated radio noise could cause interference with virtually any type of radio reception. (Corona consists of the ionization of air within a few centimeters immediately surrounding conductors.) However, in practice it has been found that the bands principally affected are the amplitude-modulated (AM) broadcast band, 535 to 1,605 kHz and in particular

those stations broadcasting below approximately 1,000 kHz. Frequency-modulated (FM) stations are seldom impacted by electric transmission facilities. Cellular phones are unlikely to be affected due to the high frequencies used.

The radio noise generated from transmission lines is a function of conductor size and geometry, conductor height above ground, phase spacing, and ground resistance. Because radio noise is due to corona discharges, it also depends on the line's operating voltage and weather conditions.

The Federal Communications Commission (FCC) considers transmission lines inadvertent emitters and therefore they are not covered directly by FCC regulations. However, in the past, the FCC and the State of Minnesota have suggested that transmission line radio noise should not result in interference within a licensed broadcast station's primary coverage area for non-mobile receivers outside the line's right of way. The proposed HVTLs are not expected to impact reception of commercial AM radio stations with non-mobile receivers.

Corona generated radio frequency noise could cause interference with TV broadcast signals. The transition to digital TV broadcasts will be complete by the time the Project is constructed. Digital reception is in most cases considerably more tolerant of noise and somewhat less resistant to multipath reflections (i.e. reflections from structures) than analog broadcasts. The picture on a digital television does not gradually degrade as with analog broadcasts, but instead becomes pixilated (turns into squares) at what is called the "avalanche point" and usually freezes.

The pixilation and freezing occurs at approximately the same interference level that an analog broadcast picture would become completely unviewable. In other words, although digital TV reception is more tolerant of radio frequency noise, if the noise level is great enough it will impact digital television. The level of interference depends on the TV signal strength for a particular channel. TV audio is an FM signal that it is typically not affected by transmission line radio frequency noise.

Due to the higher frequencies of the TV broadcast signal (54 megahertz and above), a 230 kV transmission line seldom results in reception problems within a station's primary coverage area.

Loose or damaged transmission line hardware may also cause television or radio interference.

Mitigations

Usually any reception problem can be corrected with the addition or modification of an outdoor antenna. TV picture reception interference can also be the result of a transmission structure blocking the signal to homes in close proximity to a structure. Measurements can be made to verify whether a structure is the cause of reception problems. Reception problems can usually be corrected with the addition of an outside antenna, an amplifier or both. In cases where interference is caused by loose or damaged transmission hardware, Applicants can be required to inspect and repair any loose or damaged hardware in the transmission line. Route permits typically include a condition requiring the permittee(s) to correct any interference to communications facilities it causes or creates.

2.1.6 Archaeological and Historic Resources

In Minnesota, archaeological resources tend to be located near rivers, lakes and prominent landforms. Because of the prevalence of rivers and lakes the study area is expected to have a high potential for archaeological resources. Archaeological sites relating to both prehistoric and historic habitation are common throughout the area. Impacts to archaeological resources are generally associated with direct physical impacts from project construction.

The study area also contains numerous historic sites, churches, schools, residences, state park structures and logging-related sites. While project construction may directly impact historic structures, the construction of a project may also produce indirect impacts such as visual impacts that may affect the structure's eligibility for listing on the National Register for Historic Places or the isolation of the structure from their historic context.

In addition to archaeological and historic resources, the study area also contains traditional cultural properties or traditional use areas whose locations are guarded from the general public by the Tribal Historic Preservation Office. These places are important to the heritage of local communities and may or may not contain cultural remains. The National Park Service defines a traditional cultural property this way,

> "A traditional cultural property, then, can be defined generally as one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community."[2]

[2] ***National Register Bulletin: Guidelines for Evaluating and Documenting Traditional Cultural Properties***, http://www.nps.gov/nr/publications/bulletins/nrb38/nrb38%20introduction.htm

Impacts to these places are very case specific and could only be determined in consultation with communities with ties to the study area.

Preliminary record searches have identified the locations of known archaeological and historic resources throughout the study area. Additional field surveys will be performed to identify archaeological and historic resources as part of the environmental review process under the routing process in Docket 07-1327.

Mitigations

As the major impacts to archaeological resources are associated with direct physical impacts from construction of the project, the primary mitigation strategy is to identify archaeological resources and then avoid them during the construction of the Project. Avoidance of historic structures through the routing process and final alignment will also mitigate direct impacts to these resources.

If human remains are encountered during construction, a permittee is required by the Minnesota Private Cemeteries Act (Minnesota Statute 307.08) to immediately halt construction at that location and promptly notify local law enforcement authorities and the State Archaeologist. Construction at the human remains location may not proceed until authorized by local law enforcement authorities or the State Archaeologist.

Potential impacts to specific archaeological and historic resources as well as traditional cultural properties and traditional use areas would be addressed in the route permitting process and the consultation process required under Section 106 of the National Historic Preservation Act. Specific mitigation measures would be identified through these processes as well.

2.1.7 Human Health and Safety

Generally human health and safety issues related to transmission projects can be grouped into issues associated with construction and those associated with the operation and maintenance of the Project.

As with any construction project, particularly large projects employing many people, heavy equipment, and high-voltage electrical facilities, there are safety issues during construction. Potential health and safety impacts, injuries related to worker falls, falling equipment and electrocution.

Potential health and safety impacts associated with the operation phase of the Project include: electrocution or injury from equipment failure, injuries associated with unauthorized access to

energized transmission equipment, health impacts from electric or magnetic fields associated with operation of the Project, and stray voltage.

Equipment failure and unauthorized access to transmission equipment

Electric transmission lines, and their associated facilities, carry electricity at a very high voltage. This high voltage is transformed at distribution substations down to the voltage that is used by most customers at their homes

Under certain conditions, high voltage transmission lines or high voltage substation equipment may fail. These failures are most commonly a result of extreme weather or electric circuit overloading. If equipment fails injury or death may occur as a result.

Unauthorized access to transmission equipment by persons who are not trained to work with high voltage equipment can result in serious injury or death.

Electric and magnetic Fields (EMF)

Electric and magnetic fields are created when electricity flows through any conductor. Although they are calculated and measured differently, the two are often collectively referred to as EMF.

Many years of research on the biological effects of electromagnetic fields have been conducted on animals and humans. No association has been found between exposure to EMF and human disease. While the consensus is that EMF poses no risk to humans, the question of whether exposure to EMF can cause biological responses or even health effects continues to be the subject of medical research and public debate.

In 2002, Minnesota formed an Interagency Working Group to evaluate the body of research and develop policy recommendations to protect the public health from any potential problems resulting from HVTL EMF effects. The Working Group consisted of staff from the Department of Health, the Department of Commerce, the Public Utilities Commission, the Pollution Control Agency, and the Environmental Quality Board. The Department of Health coordinated the activities of the Working Group.

In September 2002, the Working Group published its findings in a *White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options* (hereinafter "White Paper"). The Minnesota Department of Health made the following statement on EMF exposure in the White Paper:

> "The Minnesota Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF

and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk from EMF cannot be completely dismissed. The uncertainty surrounding EMF health effects presents a difficult context in which to make regulatory decisions. This approach suggests that one should avoid any activity or exposure about which there are questions of safety or health, at least to the extent that an activity can be avoided easily or cheaply."

Electric Fields

The intensity of the electric field is related to the voltage of the line. Estimates of the anticipated electric fields by structure type are shown in Table 2-4.

Table 2-4 Estimated Electric Fields (kV/meter)

Structure type	Typical Right-of-Way Width (feet)	Edge of Right-of-Way (kV/m)	Maximum Overall (kV/m)
230 kV Single-Circuit – Single Pole Davit Arm	125	0.54	2.15
230 kV Single-Circuit – H-Frame	125	0.84	2.63
230 /115 kV Double- Circuit Single Pole Davit Arm	125	0.96	2.14
230 /69 kV Double- Circuit Single Pole Davit Arm	125	0.93	2.31

If the electric field from a transmission line couples with a conductive object, such as a vehicle or metal fence located in close proximity to the line, a voltage will be induced on the conductive object. The magnitude of the induced voltage is dependent upon a variety of factors including the shape, size and orientation of the object, as well as weather conditions. If a person touches an object carrying the induced voltage, and that object is insulated or semi-insulated from the ground, then a small current would pass through the person's body to the ground. This might be accompanied by a spark discharge and mild shock – similar to what can occur when a person walks across a carpet and touches another grounded person or object.

High intensity electric fields also have the potential to interfere with the operation of pacemakers and implantable cardioverter/defibrillators. Interference with implanted cardiac devices can occur if the electric field intensity is high enough to induce sufficient body currents to cause interaction. Modern bipolar devices are much less susceptible to interactions with

electric fields. Medtronic and Guidant, manufacturers of implanted cardiac devices, have indicated that electric fields below 6 kV/meter are unlikely to cause interactions affecting operation of most of their devices.

Older unipolar designs are more susceptible to interference from electric fields. Research has indicated that the earliest evidence of interference was in electric fields ranging from 1.2 to 1.7 kV/meter. For older style unipolar designs, the electric field for some proposed structure types do exceed levels that may produce interference. In the unlikely event a pacemaker is impacted, the effect is typically a temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker would return to its normal operation when the person moves away from the source of the interference.

Magnetic Fields

The intensity of a magnetic field is related to the current flow through the wires and is measured in either Gauss or Teslas. For the purpose of measuring magnetic fields commonly found in the environment, milliGauss (mG) or micro Teslas (µT) are commonly used (one milliGauss = 10 micro Teslas). Project proposers estimated the anticipated magnetic fields for the structures being considered for the proposed Projects, as shown in Table 2-5:

Table 2-5 Estimated Magnetic Fields (milligauss)

Structure type	Typical Right-of-Way Width (feet)	Edge of Right-of-Way (mG)	Maximum Overall (mG)
230 kV Single-Circuit – Single Pole Davit Arm	125	42.38	160.92
230 kV Single-Circuit – H-Frame	125	61.01	259.25
230 /115 kV Double- Circuit Single Pole Davit Arm	125	27.16	116.84
230 /69 kV Double- Circuit Single Pole Davit Arm	125	33.53	119.57

It should be noted that magnetic fields are not singularly associated with power lines. Every person has exposure to these fields to a greater or lesser extent throughout each day, whether at home or in schools and offices. The following table (2-6) contains field readings for a number of selected, commonly encountered items. These reading represent median readings, meaning one might expect to find an equal number of readings above and below these levels.

Table 2-6 Magnetic Fields (milligauss) From Common Home and Business Appliances

Type	Distance From Source in Feet			
	0.5	1	2	4
Computer Display	14	5	2	-
Fluorescent Lights	40	6	2	-
Hairdryer	300	1	-	-
Vacuum Cleaners	300	60	10	1
Microwave Oven	200	40	10	2
Conventional Electric Blanket	39.4 peak 21.8 average			
Low EMF Electric Blanket	2.7 peak .09 average			

Source: EMF In Your Environment, EPA 1992

Past decisions have reflected that the scientific data does not show any significant risk of health effects due to exposure to magnetic fields. Policy decisions have continued to support the construction of electric infrastructure, taking into consideration the most recent information available on the issue.

The World Health Organization (WHO) recently concluded a review of the health implications of electromagnetic fields. WHO's conclusions and recommendations are summarized in WHO Fact Sheet N°322, *Electromagnetic fields and public health: Exposure to extremely low frequency fields (June, 2007)*. The fact sheet noted that much of the scientific research on long-term health effects of electromagnetic fields focused on magnetic fields and childhood leukemia. This focus is the result of many previous studies on potential health effects of electromagnetic fields that noted a weak, statistical link between exposure to EMF and incidence of childhood leukemia. Additionally, some epidemiologic studies making a regression analysis of leukemia cases have found a statistical association. A similar link has not been noted with other types of cancer. In its report, after reviewing recent studies, WHO concludes that laboratory evidence does not support these findings:

> "In 2002, IARC published a monograph classifying ELF magnetic fields as "possibly carcinogenic to humans". This classification is used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals (other examples include coffee and welding fumes). This classification was based on pooled

> analyses of epidemiological studies demonstrating a consistent pattern of a two-fold increase in childhood leukaemia associated with average exposure to residential power-frequency magnetic field above 0.3 to 0.4 µT. The Task Group concluded that additional studies since then do not alter the status of this classification.
>
> "However, the epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. Thus, if there were any effects from exposures to these low-level fields, it would have to be through a biological mechanism that is as yet unknown. Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukaemia is not strong enough to be considered causal."

WHO's guidance regarding long-term exposure to magnetic fields concludes that:

> "Regarding long-term effects, given the weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukaemia, the benefits of exposure reduction on health are unclear."

Stray Voltage

Stray voltage is defined as a natural phenomenon that can be found at low levels between two contact points in any animal confinement area where electricity is grounded. As required by code, electrical systems, including farm systems and utility distribution systems, must be grounded to earth to ensure continuous safety and reliability. Inevitably, some current flows through the earth at each point where the electrical system is grounded and a small voltage develops. This voltage is called neutral-to-earth voltage. When a portion of this neutral-to-earth voltage is measured between two objects that may be simultaneously contacted by an animal, it is frequently called stray voltage. Stray voltage is not electrocution, ground currents, EMF or earth currents.

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 and immediately under the transmission line. Stray voltage has been raised as a concern on some dairy farms because it may impact operations and milk production. Problems are usually related to the distribution and service lines directly serving the farm or the wiring on a farm. In those instances when transmission lines have been shown

to contribute to stray voltage, the electric distribution system directly serving the farm or the wiring on a farm was directly under and parallel to the transmission line.

Mitigations

The NESC provides standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths.

The United States Occupational Safety and Health Administration regulates worker safety in both construction and industrial settings and has developed and enforces regulations that are designed to protect workers from potential accidents.

Industry design standards minimize potential impacts that may occur if accidents, such as structure failure or the disconnection of a conductor, occur. Breakers and relays located at substations will de-energize a transmission line if an accident occurs. Substations are typically fenced and access is limited to authorized personnel. Proper signage warning the public of the risk of coming into contact with the energized equipment also help to avoid contact with energized electric equipment.

To ensure that any electric discharge does not reach unsafe levels, the NESC requires that any discharge be less than 5 milliamperes (“ma”). There are currently no state or federal standards for transmission line electric fields. However, in previous transmission line permits, the Environmental Quality Board and Commission have imposed a maximum electric field limit of eight (8) kV/meter measured one meter above the ground. The restriction was designed to prevent serious hazard from shocks when touching large objects like a bus or combine parked under high voltage transmission lines.

Minnesota does not have an exposure standard for magnetic fields. At least two other states have established standards for magnetic fields, e.g., Florida (150 milligauss limit) and New York (200 milligauss limit).

The International Commission on Non-Ionizing Radiation Protection has developed occupational and residential guidelines for EMF exposure (see Table 2-7 below). They have also concluded that available data regarding potential long-term effects, such as increased risk of cancer, are insufficient to provide a basis for setting exposure restrictions.

Table 2-7 International Commission on Non-Ionizing Radiation Protection Guidelines for 60 Hz EMF Exposure

	Electric Field (kv/M)	Magnetic Field (mG)
Occupational	8.3	4,200
General Public	4.2	833

The primary mitigation strategy to minimize electric and magnetic fields are in the design and location of the transmission projects. Given that magnetic fields dissipate rapidly from the source, this provides significant mitigation from exposures.

Impacts from electric fields can be minimized by grounding metal buildings, fences or other large permanent conductive object in close proximity or parallel to the line to prevent excessive discharges. Vehicles which may be parked under or adjacent to transmission lines are generally grounded adequately through their tires. In some instances, such as vehicles with unusually old tires or those are parked on dry rock, plastic or other surfaces that insulate them from the ground, the vehicle can be grounded by attaching a grounding strap to the vehicle to the vehicle long enough to touch the earth.

Minimizing the length of transmission line parallel to or co-located (through the use of structures that allow underbuilding of distribution lines) with distribution or local service conductors would minimize the potential for a transmission line to contribute to stray voltage. However, co-locating or paralleling existing distribution or local serving electric lines may be advantageous for minimizing other potential effects from the proposed transmission project

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. Potential shocks can be prevented by shorting out one or more of the fence insulators to ground with a wire when the charger is disconnected or installing an electric filter to ground charges induced from a power line while still allowing the charger to be effective.

2.2 Potential Impacts on Land-based Economies

The majority of lands within the project study area are rural in nature. Much of the study area is covered in coniferous and deciduous forest, although portions are agricultural as well as urban. The study area includes large portions of the Chippewa National Forest and the Leech Lake Reservation. The study area also includes portions of the Bowstring State Forest, Big Fork State Forest, Blackduck State Forest, Buena Vista State Forest, Mississippi Headwaters State Forest and Welsh Lake State Forest. Portions of the Chippewa National Forest and the state forests are managed for timber resources.

The Bemidji Slough Wildlife Management Area (WMA), the Wolf Lake WMA and the Hole-In-the-Bog Scientific and Natural Area (SNA) are also included in the study area. The proposed corridor endpoints are suburban (Wilton) or industrial (Boswell) in nature. Additional land uses include rural residences and farmsteads, lands protected for conservation or wildlife purposes, wetlands, and lakes. The numerous lakes and rivers in the study area also serve as recreational resources. The study area also includes the cities of Bemidji, Tenstrike, Blackduck, Deer River, Cass Lake, Bena, Zemple and Cohasset.

There are several existing linear corridors within the study area, including pipelines, electric transmission lines, roads and other highways, and railroads. New transmission lines are often co-located with existing roads and utility rights-of-way.

The project would result in both temporary impacts associated with construction and long term conversion of forested land.

2.2.1 Recreation

The study area is viewed as a recreational destination within Minnesota and contains many recreational resources and tourist destinations; including trails, rivers, lakes, national forest lands, state forests, scenic byways, historical sites, a casino, and many resorts. Many of these recreational resources are shown on Map B-5.

The Paul Bunyan and Heartland state trails cross through portions of the study area, as do 2 Minnesota Scenic Byways: the Avenue of Pines (Minnesota Hwy. 46 between Deer River and Northome), and the Lady Slipper (Highway 39 between Blackduck and US Highway 2). A portion of the Great River Road National Scenic Byway also crosses through the study area.

Recreational opportunities in the study area include boating, biking, fishing, hunting, camping, bird-watching, swimming, canoeing, riding all-terrain vehicles (ATVs) snowmobiling, cross-country skiing and nature observation. The state forests, WMAs and SNAs and the Chippewa National Forest provide opportunities for viewing wildlife and intact ecosystems. A portion of the Mississippi River through the study area is considered a water trail by the DNR.

Construction and operation of the Project could have a visual impact on recreational resources depending on the route permitted. Potential impacts include aesthetic impacts visitors to the Chippewa National Forest, numerous state forests, WMAs and the SNA in the study area as well as users of the recreational resources such as trails, lakes and rivers. They also include impacts to nature observation opportunities, particularly in areas noted as avian flyways. However, impacts are not expected to significantly reduce the availability or quality of recreational uses in the corridors.

It is assumed that direct impacts to recreational resources, such as trails, streams and lakes, can be avoided by either spanning or routing around the resource

Mitigations

Locating the route parallel to existing linear features such as transmission lines, roads and pipelines can minimize aesthetic impacts from the project. Because of the number of existing linear facilities within the study area, it is assumed that the project will be located near these existing features for a good portion of its length. However, concentrating all of these features in one larger corridor also has the potential to create a large area of visual disruption.

Impacts to recreational resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.2.2 Agriculture

Although heavily forested as a whole, the study area also contains agricultural areas, particularly at the western and eastern edges and along the northern portion of the study area. Based on survey of aerial photographs, approximately 15 - 20 percent of the study area is used for agriculture. The primary agricultural uses in the study area are pasture, row crops and small grains. Wild rice is also grown commercially in the study area.

Impacts to farmlands are usually highest during the construction phase. During construction, utility construction equipment may damage crops, compact soil, require grading, require temporary relocation of livestock fencing, and temporarily interrupt some farming activities. In

general, or by permit, utilities contact the landowners prior to construction to discuss transmission line construction schedules, potential crop damages, negotiate payments and additional mitigation measures for damage, soil compaction and other impacts.

Mitigations

In those areas where there is potential to cross agricultural fields, impacts can be minimized by structure types and placements that minimize interference with agricultural operations, especially maneuvering equipment around transmission structures. To reduce or mitigate against interference with farm operations, transmission lines are typically placed along existing road ROW, along section lines, or along existing transmission lines to reduce, mitigate, or prevent impacts on agricultural operations.

Impacts to agricultural resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.2.3 Transportation

US Highway 2 serves as a major east-west corridor within the study area. Additional major roads include Highway 71, Minnesota 371, Minnesota 200, Minnesota 46, Minnesota 38, Minnesota 6 and Minnesota 64.

Although the Mississippi River is included in the study area, its use in this area is primarily recreation and not for navigation or shipping. Thus, the proposed project is not expected to have an impact on navigation or shipping; project impacts to surface waters are discussed at Section 2.3.2.

The Bemidji Regional Airport, Moberg Airbase and Bowstring Airport are publicly accessible airports located within the study area.

Mitigations

Federal Aviation Administration (FAA) regulations govern the height of structures, including transmission line and associated towers, within certain zones near the approaches to runways. The closer the structure is to the runway, the shorter the structure must be. Since any structures would need to comply with FAA regulations, no impacts to aviation are anticipated from the Project.

New transmission lines generally do not affect surface transportation systems except for minor impacts during the construction period. These impacts are typically found at the edge of the road ROW well off the road surface and away from traffic. Utilities are required to obtain permits from federal, state, or local road management jurisdictions if a transmission line crosses a road or when the line is to occupy any part of a road ROW.

Impacts to transportation resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.2.4 Mining

Economically valuable resources within the study area include iron ore, peat, sand and gravel deposits. Because of the large deposits of sediment deposited by previous glacial activity, there are several aggregate mining operations located within the study area. There are no mineral based mining operations within the study area.

Mitigations

Impacts to mining resources can be minimized by routing away from these resources to the extent possible. If resources cannot be avoided, then alignment of the poles can minimize impacts to operations and development of mining resources.

Impacts to mining resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.2.5 Forestry

The Chippewa National Forest, 667,000 acres, covers a large portion of the study area. In addition, Bowstring State Forest, Big Fork State Forest, Remer State Forest, Buena Vista State Forest, Paul Bunyan State Forest, Land O-Lakes Ste Forest, Foothills State Forest and Hill River State Forest are also present within the study area. Portions of these forests are managed for timber production.

Possible impacts of the project include loss of forest resources, a change in forest types and uses and interference with forestry and logging operations resulting from transmission line construction.

Mitigations

In general, impacts to forestry resources can be minimized by avoiding these resources to the extent possible. However, because of the high degree of tree cover and the prevalence of managed forestry resources in the study area, the Project would almost certainly result in impacts to forestry resources.

In the event that impacts cannot be avoided, the Applicants would need to work with landowners, including the Chippewa National Forest and DNR, to identify appropriate alignment of the line to minimize impacts to forestry resources.

Impacts to forestry resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.2.6 Hunting and Gathering

The study area contains a variety of plants and animals that, while not managed as a typically-defined agricultural resource, provide important cultural, food and economic resources to people in the area. Plant resources include wild rice, maple trees and a variety of nuts and berries. A variety of animals are hunted or trapped. These resources may be harvested for personal use or sold for income. In many cases access to these resources are guaranteed for registered tribal members through treaty rights.

Impact to these resources could include loss of these resources resulting from construction and maintenance of the Project.

Mitigations

With respect to the plant species avoidance of these areas is the primary mitigation strategy. When these resources cannot be avoided it may be possible in some cases, for instance blueberries, to re-plant them.

With respect to animal species, impacts and mitigations would vary by species. Some species may thrive on the edges created by ROW or may simply relocate in the general Project area. In other cases, the construction and maintenance may result in significant disruption to the population.

Impacts to hunting and gathering resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts. Impacts and mitigations

related to culturally significant resources would need to be determined in consultation with communities with ties to the study area.

2.2.7 Economic Development

The Project is intended to meet the projected future electric customer demand and continue to maintain the reliability of the transmission system in the Bemidji area in north central Minnesota. In addition to meeting the future needs of the Bemidji area, the Project is intended to maintain regional transmission reliability for the larger northwestern Minnesota and eastern North Dakota region and to facilitate the addition of new generation sources in the region. Specifically, portions of the Red River Valley and eastern North Dakota have been identified as areas for the potential development of wind-energy generation sources and the added transmission capacity from the Bemidji–Grand Rapids Line will assist in the development of such resources. These needs, if unmet, have the potential to retard economic development. Conversely, meeting these needs provides resources necessary for economic growth.

The population growth in three of the counties covered by the study area (Beltrami, Cass, Hubbard) exceeded the population growth of Minnesota as a whole during both the 1980 – 2000 and 1990 – 2000 time periods. The population growth in Itasca County was less than that of Minnesota as a whole during the same time periods. The population growth in these areas tends to be within the townships and unincorparated areas, rather than the cities. Plentiful, reliable energy service is a necessary, though not sufficient, condition for economic development. Unreliable energy service can result in the unavailability or under use of other economic resources (labor, capital) and the need to invest in redundant power supplies.

A plentiful energy supply – one that is fairly matched to anticipated growth and affordable – ensures economic stability, fosters investments, and guides the allocation of resources to best advantage. The Applicants project growth in peak demand in the Bemidji area of approximately 148 MW between the winters of 2007/08 and 2022/23. Leaving this demand unmet will likely retard economic growth. The Minnesota Department of Employment and Economic Development (DEED) cites access to affordable energy resources as an economic advantage for Minnesota businesses.[3]

Mitigations

The proposed Project may have negative impacts on economic growth in specific circumstances. Transmission lines and their construction can have a detrimental effect on

[3] Foundations of Commerce, www.deed.state.mn.us/whymn/foundations.htm

ecosystem services and related human endeavors. As noted elsewhere in this section, transmission lines can impact agricultural production, forestry, and recreation. Many of these impacts can be mitigated, particularly where the physical footprint of the transmission line can be removed from land-based economic activities and placed in existing ROW. Similar measures can also mitigate, though perhaps to a lesser extent, the visual or aesthetic footprint of a transmission line.

For businesses that depend, directly and indirectly, on a pastoral setting to thrive (e.g. canoeing, cycling, hiking, nature observation), transmission lines may retard economic growth. Again, mitigation through proper routing can minimize potential negative economic effects.

2.3 Potential Impacts on Natural Environments

The study area has a complex surface geology, formed over many episodes of glaciation. It is characterized by deep (200-600ft [60-180m]) glacial deposits in outwash plains, lake plains, till plains, outwash channels, moraines, and drumlin fields. The patterns of vegetation in this section reflect the complex and patchy distribution of these glacial deposits. Vegetative cover (Figure B-4) includes a mix of deciduous and coniferous communities, as well as sedge meadows and alder and willow swamps.

2.3.1 Air Quality

During transmission line construction, there are emissions from vehicles and construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by the construction-related emissions are expected to occur. Exhaust emissions from diesel equipment will vary during construction, but will be minimal and temporary. Fugitive dust may result from ROW clearing. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place.

The only potential air emissions from a 230 kV transmission line result from corona and are limited. Corona can produce ozone and oxides of nitrogen in the air surrounding the conductor, especially in humid conditions. Corona consists of the ionization of air within a few centimeters immediately surrounding conductors. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived. Ozone has the potential to be an air pollutant in regions where emissions of volatile organic compounds (VOCs) and nitrous oxides (NOx) are relatively high (typically urban areas). Ozone produced by transmission lines has a negligible impact on air quality.

2.3.2 Water Quality

The study area is replete with lakes, rivers, and wetlands (Figure B-3). Many are categorized as public waters and listed in the Minnesota DNR Public Water Inventory (PWI). Minnesota Public Waters are water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statute 103G.005. The DNR has regulatory jurisdiction over these waters.

Reflecting their importance to ecosystems, wildlife, and human endeavors, water resources are regulated by several different agencies in Minnesota, including the United States Army Corps of Engineers, the Minnesota Board of Water and Soil Resources (BWSR), the DNR and the MPCA.

Surface Waters

The Project would cross several rivers, including the Mississippi River at two locations, one on the western edge, while leaving the Bemidji area, and once as it approaches the Boswell Substation.

The primary impact of transmission lines on surface waters is during project construction. During transmission line construction there is the possibility of sediment reaching surface waters when the ground is disturbed by excavation, grading, and construction traffic. Once constructed, the Project would not be expected to have ongoing impacts on surface water quality.

Groundwater and Wetlands

As shown in Figure B-3, wetlands cover a large portion of the study area. Wetlands are areas characterized by mostly wet soil and are saturated with water either above or just below the surface. The plants covering wetlands have adapted to wet conditions. In addition to serving as recreational resources for canoeing, hunting, fishing and nature observation, they serve several important functions to the ecology and environment – erosion control, flood attenuation, fish and wildlife habitat, ground water recharge and water quality protection.

The National Wetland Inventory was conducted by the U.S. Fish and Wildlife Service to classify and map wetlands throughout the United States based on aerial photographs. The Minnesota portion of the inventory was completed in the early 1980's. Because of shortcomings in the technology used at the time the mapping in forested areas, such as the study area, is widely acknowledged as less accurate than in other areas of the state. Nevertheless, the NWI data does provide a strong indication of the prevalence of wetlands within the study area.

Another indicator of wetlands is the presence of hydric soils. An analysis of hydric soils shows that they comprise approximately one-third of the total acreage in the study area.

Wetlands are protected under Sections 401 and 404 of the Clean Water Act and by Minnesota Rules Chapter 6615 (Public Waters Work Permit Program) and Chapter 8420 (Wetland Conservation Act). A number of agencies have permitting authority over activities that impact wetlands, including (but not limited to) the US Army Corps of Engineers, DNR, MPCA and local governmental units.

Impacts to wetlands would most likely occur through construction and maintenance activities. Possible impacts of the Project include loss of wetlands and their habitat, conversion of wetland types, change in water quality and water recharge, interference with these functions by disruption or displacement of wetlands.

Ground water quantity and accessibility is generally good in the study area. The depth to the water table varies from five to over 50 feet in the study area. None of the wells identified within the study area were located in a bedrock aquifer, all were located in the shallower surficial aquifer system. Temporary impacts to groundwater resources may occur if dewatering is necessary to install any transmission structures. The Project would not be expected to impact municipal or private water use in the study area.

Mitigations

The preferred mitigation strategy for both surface waters and wetlands is avoidance through routing around or spanning these features. Decisions on how best to span waters are often complicated by topography, natural areas, and existing settlements, infrastructure, and uses. These considerations would be taken up in the route permitting process. Because of the habitat in the study area and the number of large wetland complexes it is unlikely that all wetland impacts could be avoided.

While avoidance is not possible in all cases, best management practices can be implemented to minimize impacts:

- Use of best management practices for sediment and erosion control
- Scheduling construction in wetland areas during frozen ground conditions when possible
- Use of construction mats and all-terrain construction vehicles to minimize impacts to wetland soils when construction occurs outside of frozen ground conditions
- Accessing the wetland with the least amount of physical damage to the wetland

- When practical, assembling structures on upland areas before they are brought to the site for installation
- Development and implementation of spill prevention procedures to avoid wetland contamination

Prior to construction, the Applicants would be required to obtain a National Pollution Discharge Elimination System (NPDES) permit from the MPCA. As part of its NPDES permit application, the Applicants will develop a Storm Water Pollution Prevention Plan (SWPPP) to identify erosion and sedimentation control measures to prevent adverse water quality impacts to streams and wetlands during and after construction.

Water resources in Minnesota are regulated under a variety of local, state, and federal programs. Oftentimes two or more of these programs cover the same feature. Work affecting the course, current, or cross-section of a lake, wetland, river, or stream may require a permit from one or all of the following agencies:

- The US Army Corps of Engineers regulates all waters of the US and has overlapping regulations with the DNR and Wetland Conservation Act;
- DNR regulates all lakes, wetlands, rivers, and streams identified on DNR Public Waters Inventory maps;
- Local units of government regulate impacts to wetlands under the Wetland Conservation Act.

These permitting processes would identify potential impacts to water resources as well as mitigation strategies to minimize impacts.

Any dewatering would require a permit from DNR. The permit would identify conditions to minimize impacts from the Project.

Impacts to water resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts. The Applicants will also be required to obtain permits for water crossings from the Minnesota DNR, the US Army Corps of Engineers, or the local unit of government. These permits would identify mitigation conditions particular to each crossing.

2.3.3 Soils and Geology

Generally the soils found within the study area are categorized as well-drained to excessively well-drained sandy loams or loamy sands on uplands, with poorly-drained much soils found in the large wetland depressions, peatlands and bogs.

Soil disturbance will result from construction activities, including vegetative clearing along ROW and excavation at structure locations. Areas where disturbance has been minimal typically require minimal assistance in re-establishment of a vegetative stratum to control soil erosion. However, areas with significant soil compaction and disturbance from construction activities may require assistance in reestablishing the vegetation stratum and controlling soil erosion.

Mitigations

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

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

As discussed in Section 2.3.2, the Project would require a NPDES permit from the MPCA. The NPDES permit would identify mitigation strategies.

The area of disturbance will not be determined until final Project design is complete. Mitigation strategies may also be identified in the License to Cross Public Waters.

Minimal impacts to soils outside of the direct impact of the transmission line structures and substation expansion areas are anticipated. The route permit for the Project would require that soils compacted by construction are restored by the utility after construction is complete.

Assuming the implementation of appropriate mitigation measures, no permanent impacts to the subsoil or geology within the study area would be anticipated.

Impacts to soils and geology associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.3.4 Flora and Fauna

The ecological land classification system is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features. The study area is located within the northern Minnesota Drift and Lake Plains Ecological Section and covers portions of the Chippewa Plains, and St. Louis Moraines subsections. The patterns of vegetation of this

section reflect the complex and patchy distribution of glacial deposits. Vegetative cover includes a mix of deciduous (sugar maple, basswood, paper birch, aspen and northern red oak) and coniferous (white pine, red pine, jack pine) species along with sedge meadows and alder and willow swamps occur along the sluggish streams draining the flat lake plains and along the Mississippi and Leech Lake rivers .

Impacts to flora from the Project may include a loss of flora resulting from clearing and maintenance of the right-of-way; a change in flora communities; habitat fragmentation; and the introduction of noxious weeds and invasive organisms.

The study area provides habitat to a variety of animals: mammals (voles, shrews, mice, rabbits, beaver, bobcat, coyote, gray wolf, river otter, fox, white tailed deer, and black bear), waterfowl, songbirds (including forest, wetland and grassland species), fish, reptiles, and amphibians.

Potential impacts to fauna from the Project may include loss of breeding and foraging habitats, changes in wildlife communities from habitat loss or fragmentation, and avian mortality or injury from collisions with transmission lines or electrocution.

Mitigations

Because much of the study area is forested, some loss of habitat and change in flora communities will occur from the Project due to right-of-way clearing. Loss of habitat and change in flora communities can be minimized by minimizing the amount of trees cleared through location of the right-of-way.

Resilient species of common grasses and shrubs that have been disturbed during construction typically reestablish with few problems. However, areas where construction has resulted in significant soil compaction may require more proactive measures to re-establish vegetation to pre-construction cover in areas previously covered in low-growing vegetation, or to establish a regionally appropriate low-growing vegetative cover and prevent introduction of noxious weeds and invasive organisms. Noxious weeds and invasive species can also be prevented through identification of right-of-way and construction staging areas that currently contain noxious weeds prior to construction and avoiding these areas where possible. During construction power washing of construction vehicles would prevent introduction of invasive species to rights-of-way.

Wildlife may be displaced during right-of-way clearing and transmission line construction. Because much of the study area is forested, some habitat loss will occur due to right-of-way clearing. Impacts from wildlife displacement, habitat loss and fragmentation will be evaluated

in the EIS being prepared for the routing process. For transmission lines, impacts to terrestrial wildlife are generally short-term and are a result of construction. Animals have the ability to temporarily move out of construction areas. The distance that animals will be displaced will depend on the species.

The potential for avian collision and electrocution can be minimized through transmission line and substation design. Avian impacts can be mitigated by marking transmission line shield wires or using alternative structures to reduce the likelihood of avian collisions.

Impacts to flora and fauna resources associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts.

2.3.5 Natural Resources of Special Concern

Natural resources of special concern within the study area include unique or high value ecological communities or woodland remnants, as well as plant and animal species considered to be at some level of risk. The study area includes a portion of the Hole-in-the-Bog SNA and an Old Growth White Pine community of special concern.

There are no federally-listed threatened or endangered species in the study area. Lists identifying species of concern are maintained by the US Forest Service, the DNR, and the Leech Lake Band of Ojibwe. An examination of the lists maintained by these resource agencies identifies the following species of concern:

- six species of birds (Le Conte's Sparrow, Great Blue Heron, Olive-sided Flycatcher, Connecticut Warbler, Osprey, Black-backed Woodpecker);
- one species of mammal (Puma);
- two invertebrates (Creek Heelsplitter, Black Sandshell); and
- 12 plant species (Dragon's Mouth, Dissected Grapefern, Triangel Moonwort, Mingan Moonwort, Goblin Fern, Pale Moonwort, St. Lawrence Grapefern, Least Grapefern, Ram's Head Lady's Slipper, White Adder's-mouth, Clustered Bur Reed, and Canada Yew).

In addition to the species identified in the above list, the study area also contains several Bald Eagle nesting areas. The Bald Eagle, although no longer listed as a threatened or endangered species in the Great Lakes Area, receives federal protection through the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

Possible impacts of the Project include loss or fragmentation of high value ecological communities. This includes the possible loss of habitat for threatened and endangered species

within the corridors of certain rare species. It is also possible, though unlikely, that certain rare species or communities could be extirpated, or destroyed, if appropriate mitigative measures are not identified and implemented.

Impacts to Natural Resources of Special Concern will be evaluated in the EIS being prepared for the route permitting process (Docket TL-07-1327).

Mitigations

The primary means of mitigating these potential impacts is to identify the sensitive locations and avoid them in routing of the transmission line and to implement best management practices during construction to ensure avoidance is effective.

There is the possibility of post-construction impacts for avian species – namely, collisions with transmission lines and towers. Proper design and routing can mitigate these impacts.

Impacts to natural resources of special concern associated with specific routes will be addressed in the EIS being prepared as part of the route permit proceeding (TL-07-1327). That process will also identify potential mitigative measures to minimize these impacts. Biological surveys on proposed routes will be done during the routing process to identify sensitive locations.

3.0 System Alternatives

According to Minnesota Rule 7849.7060 subp 1B, an Environmental Report must include the following:

> A general description of the alternatives to the proposed project that are addressed. Alternatives shall include the no-build alternative, demand side management, purchased power, facilities of a different size or using a different energy source than the source proposed by the applicant, upgrading of existing facilities, generation rather than transmission if a high voltage transmission line is proposed, transmission rather than generation if a large electric power generating plant is proposed, use of renewable energy sources, and those alternatives identified by the commissioner of the Department of Commerce.

This section provides a broad view of three alternatives and their impacts, especially those specified in the state rules, those alternatives reviewed by the applicant, and those addressed in public comment, related to three alternatives to the proposed project:

- No-build alternative, including demand-side management and conservation measures;
- Transmission system alternatives, including existing line or system improvements; and
- Generation alternative.

The project is proposed to:

- meet the projected future electric customer demand and continue to maintain the reliability of the transmission system in the Bemidji area in north central Minnesota;
- maintain regional transmission reliability for the larger northwestern Minnesota and eastern North Dakota region; and
- facilitate the addition of new generation sources in the region. Specifically, portions of the Red River Valley and eastern North Dakota have been identified as areas for the potential development of wind-energy generation sources and the added transmission capacity from the Bemidji–Grand Rapids Line will assist in the development of such resources.

In this review, alternatives are evaluated for their potential environmental impacts and for what they may or may not be able to contribute to the stated purpose of the Project.

3.1 No-Build Alternative

Under the no-build scenario described at pp. 51-53 of the Application, the Project would not be constructed. Instead, significant load management and conservation measures would be needed to limit energy load growth and the local reactive power[4] supply would need to be improved to enable the current transmission system to handle the projected increase in energy demand. The no-build alternative described in the Application combined additional demand-side management, reactive power supply (capacitors), and greater use of local generation (the Solway generating station).

The OES Energy Regulatory Planning (ERP) staff estimates that a minimum of 110 MW of load reduction would be required to function as a viable alternative to the Project. ERP staff based this estimate on the 110 MW of dispatchable distributed generation identified as an alternative on page 56 of their Application. The Applicants estimate this amount to provide the redundancy to ensure that at least 76 MW would always be available.

In order to ensure voltage stability in the event of loss of one or more transmission sources into the area, the region's reactive power supply would require improvements. Energy demand in the Bemidji area is met primarily by power generated outside the area and transmitted to the area via the bulk transmission system. Otter Tail Power's Solway Generating Station, a 40 MW dual-fueled (natural gas and oil) peaking generator located approximately 13 miles west of Bemidji, is the only generator in the Bemidji area. The Solway Generating Station also has the ability to operate as a source for dynamic reactive power supply.

3.1.1 Human and Environmental Impacts

Under this alternative, there would be no impacts to archaeological, historical, visual, recreational, agricultural, transportation, mining, forestry, soils geology, flora, fauna resources or natural resources of special concern. No displacement would result from this alternative.

Under this alternative, the Solway plant may need to operate more frequently than it does currently to ensure that sufficient reactive power is available. Increased operation of the plant would increase air emissions. The air permit for the Solway plant contains limitations on the

[4] Reactive power is the portion of electricity that establishes and sustains the electric and magnetic fields of alternating-current equipment.

time the plant can be run using the fuel oil. This condition may limit the time that the plant can be operated.

Increased operation of the Solway plant may also require an increase in groundwater appropriations to provide water for cooling, emissions control and domestic water use. The existing groundwater appropriations permit from the DNR would likely need to be amended. In reviewing the request to amend the permit, DNR would add any permit conditions it believes necessary to mitigate potential negative impacts.

It is likely that noise would increase from the more frequent running of the Solway plant. However, the Solway plant would still need to comply with MPCA noise standards. Because of the distance between the plant and the nearest residences, it is unlikely that the requirement to meet the noise standards would be a limiting condition on the operation of the plant.

Because this alternative does not improve the transmission reliability in the area, it is likely that social and economic impacts to the area would be negative.

3.1.2 Feasibility and Availability

In their comments on the CON application, ERP staff estimated that at least 110 MW of load reduction in addition to objectives identified in the Applicants' Resource Plans[5] would be required to meet projected load growth in the project area. For purposes of comparison, the Applicants' total demand savings in 2007 was 13.8 MW. ERP staff concluded that it is not feasible for the Applicants' to achieve the amount of demand reduction equivalent to the generation to meet the identified need. The ERP comments concluded that the no-build alternative would entail maintaining unreliable service in the local area.

3.2 Transmission System Alternative

This section examines transmission system alternatives, including existing line or system improvements. Route alternatives between the Wilton and Boswell Substations will be evaluated in the EIS prepared for the Routing process under Docket 07-1327.

The Applicants identified three transmission alternatives to the proposed project (see Application at Section 5.4):

[5] Pursuant to Minnesota Statutes, Section 216B.2422, each utility is required to periodically submit a Resource Plan for review by the Commission. These resource plans identify a set of resource options that a utility could use to meet the service needs of their customers. Among the resource options that must be described are demand side management measures that would control customer loads and implement customer energy conservation.

- Adding a second Winger-Wilton 230 kV transmission line on separate structures from the existing 230 kV line (53 miles with 2 substation upgrades);
- Adding a Badoura – Wilton 230 kV line on separate structures from the existing 115 kV line (48 miles with 2 substation upgrades); and
- a rebuild of two existing 115 kV lines, Badoura – Wilton and Winger – Wilton, (100 miles with 5 substation upgrades)

3.2.1 Human and Environmental Impacts

Impacts to human settlement, land-based economies, and natural environments would generally be similar to the proposed Project with the following exceptions.

It is not known whether any of the transmission system alternatives would require the installation of transformers. Any addition of any transformers to the existing substations would result in additional noise generated at the substations. Noise from the transmission lines themselves would be similar to the proposed Project. In all cases, any additional noise impacts would be required to meet the MPCA's noise standards, as discussed in Section 2.1.3.

The visual characteristics of all transmission alternatives evaluated are similar to the proposed project. The land use along both the existing Badoura – Wilton and the eastern portion of the area between Wilton and Winger substations is similar to the proposed Project and the visual impact from the transmission alternative would be expected to be similar to the propose Project in these areas. Because the land use approaching the Winger Substation from the east is more agricultural with less tree cover than the study area for the Project, there would be less tree clearing required under either transmission alternative between the Wilton and Winger substations. Mitigation of aesthetic impacts would be similar to those noted in Section 2.1.4.

With respect to impact on agricultural land, either of the transmission alternatives involving construction between the Wilton and Winger substations would likely result in a somewhat greater impact to agricultural land. However, the overall impact to agriculture would not be significantly different than for the Project.

3.2.2 Feasibility and Availability

ERP comments stated that the Applicant had reasonable reasons for dismissing other alternatives and did not identify any additional viable transmission alternatives.

The application shows that the rebuild of existing lines would result in voltage collapse in the event of a Wilton-Winger and Badoura-LaPorte outage. All of the transmission alternatives show inferior electric performance and cost-to-benefit profile compared to the Project. Any of

the transmission alternatives would require additional load-serving improvements in the study area sooner than the 10-15 year window provided by Project.

3.3 Generation Alternative

Because of the limited transmission capacity for importing energy from other regional generation resources, only dispatchable (readily available on demand) generation could serve as a replacement to the proposed project. Intermittent resources such as wind generation would not be feasible stand-alone solutions because they are not readily available on demand.

Generators typically have availability in the range of 85 – 95 percent, compared to a 99.9 percent availability factor for a new transmission line. Because of these differences, a generation alternative would need to incorporate a higher rated capacity than the anticipated 76 MW deficit by 2011-2012 noted in planning materials to allow for down time as well as expected load growth beyond that date. This generation could be located at a single site, or at a number of smaller sites disbursed through the area.

The Applicants identified two generation scenarios:

- Central Station Alternative: an installation of a 180 MW gas-fired plant comprised of three 60 MW gas-fired combustion turbines. The capital cost of this alternative is assumed to be $700/kW, or approximately $126 million.
- Distributed Generation Alternative: installation of 110 MW disbursed across 11 sites. It is anticipated that each 10 MW generation site would be comprised of between five and seven 1.5 – 2 MW diesel or natural gas generators for a total of 55 – 77 individual generators. The capital cost for this sub-alternative is assumed to be approximately $7.65 million for each of the 11 sites, or approximately $84.15 million in total for the 11 sites.

Adding new generation into a generation-rich area, such as the North Dakota Export (NDEX) boundary where the Project is proposed, requires either displacement of existing generation with the area or increasing the transmission outlet capability to allow continued operation of the existing generation. The existing generation within this boundary is very heavily weighted toward low-cost baseload coal (lignite) and hydroelectric facilities. Because of the cost differential between the existing baseload facilities and the higher cost generators in this alternative, displacement of these sources would increase total system production costs. Because the NDEX boundary is a power transfer-limited interface, adding new generation within its boundaries would require transmission additions to increase the existing generation outlet capability. The ER assumes that increased transmission of a length and voltage similar to

the Project would be required to support the new generation supplied in the central station alternative.

The distributed generation alternative also faces transmission constraints, as noted in the *Dispersed Renewable Generation Transmission Study* released by the Department of Commerce in July, 2008. That study assessed the potential for installing 600 MW of dispersed renewable generation throughout Minnesota in a way that produced minimal impacts on the transmission system. The analysis demonstrated a dispersed renewable generation potential scenario where 600 MW could be sited without significantly affecting any transmission infrastructure. That analysis found potential for integrating distributed generation in northern Minnesota constrained by the existing transmission infrastructure. The study identified a potential for up to 40 MW of distributed generation in the Cloquet area, the only northern Minnesota site identified. In contrast, that study identified the potential for approximately 300 MW of distributed renewable generation in southeastern Minnesota and approximately 160 MW of potential in southwestern Minnesota. Based on this assessment of transmission potential for distributed generation, it would appear that the distributed generation sub-alternative would also require the addition of transmission to be viable.

Central Station Sub-Alternative:
For purposes of comparison, two similarly sized combustion-turbine plants that received site permits in the past five years were reviewed:

Table 3-1 Combustion Turbine Plants Used in Generation Alternative Comparison

Plant Name	Size	Fuel	Site Size (acres)
Elk River Peaking Station	175 MW	Natural Gas/Fuel Oil	11 – 40
Cambridge Energy Station	170 MW	Natural Gas	2.5

Gas plants are typically located near both HVTLs and natural gas pipelines. Because of the transmission constraints in this area, installation of a central station generation alternative would entail construction of new transmission of similar length and voltage to the proposed project. The ER assumes that this sub-alternative would require construction of a natural gas pipeline of no more than 10 miles. The ER also assumes that the central station alternative would require the addition of transmission of a similar length to the Project.

Distributed Generation Sub-Alternative

The ER assumes that each of the 11 sites would require the use of between 1 and 2 acres for a total land use impact of 11 – 22 acres. The ER also assumes that each generation site under this alternative would connect to the distribution system, and would not require the addition of transmission facilities. The ER assumes that the distributed generation alternative would require the addition of transmission of a similar length to the Project.

3.3.1 Human and Environmental Impacts

The potential impacts from the transmission component of the generation alternative are assumed to be similar to the Project. Potential impacts to human settlement, land-based economies, and natural resources would be similar in many ways to the Project with the following exceptions.

The generation alternative would increase noise above current levels from both the generating facility and the transformers installed at the facility substation. Each facility would be required to meet the MPCA noise requirements, as described in Section 2.1.3.

The primary visual difference between this alternative and the Project would be the addition of an emissions stack associated with each generation facility.

Construction of this alternative would likely result in an injection of jobs. In the case of the central station alternative, up to 100 temporary jobs related to the construction of the facility, as well as a small number, fewer than 10, of permanent jobs during the operations phase. Construction of under the distributed generation alternative would require fewer jobs and shorter duration at each facility. This ER assumes that no permanent jobs would be created during the operations phase of the distributed generation sub-alternative, as each facility would be dispatched remotely.

Both the central station and distribution sub-alternatives would require a permit from the MPCA to govern their air emissions. Air emissions would depend upon the particulars of the plant design, but for purposes of comparison Table 3-2 summarizes the estimated air emissions from similarly sized central station plants and from the Rushford facility, a 6 MW plant.

Table 3-2 Facilities Potential to Emit as per MPCA Permits (tons/year)

	Facility Size (MW)	Operating Hours/year	PM10	SO2	NOx	CO	VOC	Single HAP	Total HAP
Elk River – Natural Gas Fired	175	1,454 (Gas) 668 (Fuel Oil)	86.5	1.7	219.9	160	23.5	Formaldehyde 0.85	2.95
Cambridge Energy Facility	170	876	14.4	1.4	66	14.4	3.6	Formaldehyde 0.6	0.835
Rushford Facility	6	2,415	2.27	1.14	72.49	19.26	2.03	N/A	N/A

The central station alternative would likely require water for cooling, emissions reduction and domestic use. The amount of water would depend heavily on the particulars of the facility design. The water would be obtained either from surface water or from a well drilled for this purpose at the project site. Any water appropriations for the facility would be governed by permit. Any discharge from the facility itself would require treatment to remove contaminants. Any facility requiring disturbance of more than 1 acre would require a SWPPP plan to mitigate impacts from stormwater runoff as part of its NPDES permit.

Both generation alternatives would require vegetation clearing for construction and operation of the facility. The central station alternative would require clearing of approximately 40 - 50 acres, and the clearing required for the distributed generation sub-alternative is estimated at approximately 10 – 20 acres in total. Additionally, construction of a natural gas pipeline would require vegetation clearing during construction, although the area would be allowed to re-vegetate after the construction period. Impacts to vegetation and wildlife from the transmission lines required in this alternative would be similar to that of the Project.

3.3.2 Feasibility and Availability

The generation alternative could be constructed. The technologies analyzed have been constructed in Minnesota. Utilities and independent generation developers are able to successfully construct and operate such facilities.

Overall, the ERP staff comments note that generation is not a cost effective alternative to the Project. Furthermore, because of the existing transmission constraints in the study area, this alternative would require construction of new transmission facilities similar in length and

voltage to the Project. New transmission lines constructed under this alternative would negate any benefit of this alternative over the Project.

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4.0 Regulatory Framework

The Project is considered a Large Energy Facility under Minnesota Statute 216B.2421 and requires both a certificate of need and a route permit from the Commission. Both the certificate of need and route permitting processes require environmental review of the Project. In addition to these approvals, the Project also requires additional permits from several state agencies and may require permits from some local agencies. The Project will require review and approval by several federal agencies and is subject to federal environmental review under the National Environmental Protection Act (NEPA). Expected approvals that would be required before actual construction of the project are outlined in Table 4-1.

Table 4-1 Required Permits or Approvals

Permit	Jurisdiction
Local Approvals	
Utility Crossing Permit	County, Township, City
Land Permits	County, Township, City
Overwide Loads Permits	County, Township, City
Driveway Permit	County, Township, City
State of Minnesota Approvals	
Certificate of Need	Public Utilities Commission
Route Permit	Public Utilities Commission
Utility Permit	MN/DOT
License to Cross Public Waters	Minnesota DNR Division of Lands and Minerals
Wetlands Conservation Act	Board of Water and Soil Resources
NPDES Permit for construction activity	Minnesota Pollution Control Agency
Federal Approvals	
Section 106 Review	USDA Rural Utilities Service
Section 7 Consultation	US Fish and Wildlife Service
Section 10 Permit	U.S. Army Corps of Engineers
Section 404 Approval	U.S. Army Corps of Engineers
Permit to Cross Federal Aid Highway	Federal Highways Administration
Notice of Proposed Construction (7460-01)	Federal Aviation Authority
Notice of Actual Construction or Alteration	Federal Aviation Authority
Prime Farmland (Form AD-1066)	Natural Resource Conservation Service
Spill Prevention, Control and Countermeasure	Environmental Protection Agency
Compatibility Analysis of Disturbed Easements/Lands	US Fish and Wildlife Service

4.1 Certificate of Need

The certificate of need process is governed by Minnesota Rules 7849.0010 – 7849.0400. The certificate of need process is the only proceeding in which a no-build alternative and the size,

type, timing, system configuration, and voltage of a proposed project will be considered. The Applicants applied for a certificate of need for the proposed transmission line on March 17, 2008. On July 22, 2008, the Commission accepted the application as complete. The application may be accessed at the following sites:

- Electronic copies may be reviewed on the utilities' project website at http://www.CapX2020.com/. All filings with the Commission, including the application, are also on the Commission's website at http://www.puc.state.mn.us/. Click on the "Search eDockets " button, then enter the year "07" and the sequence number "1222." Additional information may be found on http://energyfacilities.puc.state.mn.us/Docket.html?Id=19344
- Hard copies may be reviewed at the county libraries throughout the study area.
- For additional hard copies, contact Bob Lindholm, Minnesota Power at rlindholm@allete.com or (218) 355-3342.

In its order accepting the application as substantially complete, the Commission authorized an informal process pursuant to Minn. Rules, Part 7829.1200, and directed Commission staff to initiate a comment and reply period to identify any contested issues.

What the Commission Decides

The certificate of need process is designed to evaluate the level of need, as well as the alternatives available to satisfy that need. The Commission determines the basic type of facility (if any) to be constructed, the size of the facility, and the timing of the facility (e.g., the projected in-service date).

Environmental Review

The OES prepares an ER on proposed large energy facilities that come before the Commission for a determination of need. The ER analyzes the human and environmental impacts of the proposed project and need-related alternatives, and addresses mitigating measures for anticipated adverse impacts as required by Minnesota Rules, parts 7849.7010 to 7849.7110. To focus the content or “scope” of the ER, the OES conducts public meetings to gather comments, questions, and alternatives to the proposed project.

Steps in the Certificate of Need Process

The Commission’s review process for the proposed facility consists of the following basic steps, mostly in chronological order:

1. Review of the application for completeness; order for the applicant to submit supplementary materials, if deemed necessary.
2. Preparation of an environmental review document (i.e., the Environmental Report) by the staff of the OES.

3. Efforts to notify the public of the hearing schedule and other matters, including display ads in local newspapers.
4. Public hearings to receive input and questions from the public.
5. A public hearing before the Commission to hear oral arguments and deliberations by the Commission.
6. Issuance of a written decision or order by the Commission.
7. Post-decision activities, possibly including reconsideration and judicial review.

Length of the Need Process

The certificate of need statute includes a decision deadline of twelve months from the time a complete application is filed. The Commission will deliberate to make a final decision as soon as practicable following receipt of the ALJ's Report and exceptions from the formal parties to the proceeding

Ways for the Public to Participate in the Certificate of Need Process

Members of the public may participate in the following ways:

- By participating in the environmental review process conducted by the Department of Commerce.
- By offering comments and questions at the hearings specifically designed for that purpose. Members of the public do not have to meet any other prior requirements to be able to participate in these hearings.
- By submitting written comments to: Administrative Law Judge Beverly J. Heydinger, Office of Administrative Hearings, P.O. Box 64620, St. Paul, MN 55164-0620. beverly.heydinger@state.mn.us. The deadline for written comments will be determined by the Administrative Law Judge.

Hearing Schedule

Public hearings to discuss the need for the proposed facilities will be held from May 20-21, 2009, at locations in the study area. At those hearings, members of the public will be allowed to address need issues; staff from the OES will be available to receive questions and statements from members of the public. Notice of the public hearings will be placed in local newspapers at least 10 days prior to the start of the hearings.

4.2 Route Permit

High voltage transmission lines constructed in Minnesota require a route permit from the Commission. The route permitting process is governed by Minnesota Rules 7849.5010 – 7849.6500. The Applicants applied for a route permit for the proposed transmission line on June 4, 2008. On June 26, 2008, the Commission accepted the application as complete. The application may be accessed at the following sites:

- Electronic copies may be reviewed on the utilities' project website at http://www.CapX2020.com/. All filings with the Commission, including the application, are also on the Commission's website at http://www.puc.state.mn.us/. Click on the "Search eDockets " button, then enter the year "07" and the sequence number "1327." Additional information may be found on http://energyfacilities.puc.state.mn.us/Docket.html?Id=19344
- Hard copies may be reviewed at the county libraries throughout the study area.
- If you have questions about the availability of additional hard copies, contact Bob Lindholm, Minnesota Power at rlindholm@allete.com or (218) 355-3342

What the Commission Decides

A route permit cannot be issued for the Project unless the Commission has issued a Certficate of Need. In a routing process, the Commission would determine the specific route to be followed. The route permit also includes any conditions on the construction, operation or maintenance of the Project that the Commission believes necessary.

Environmental Review

As part of this permitting process, OES will prepare an Environmental Impact Statement (EIS). The EIS will contain information on the human and environmental impacts of the Project and select alternatives and addresses mitigating measures for anticipated impacts. To focus the content or "scope" of the EIS, the OES conducted public meetings to gather comments and questions on the proposed project.

Steps in the Route Permitting Process

The Commission's review process for the Project consists of the following basic steps, mostly in chronological order:

1. Review of the application for completeness; order for the applicant to submit supplementary materials, if deemed necessary.
2. Request for assignment of an Administrative Law Judge (ALJ) from the Office of Administrative Hearings, an agency independent of the Commission.
3. Prehearing conference before the ALJ to discuss procedural issues, including an intervention deadline for requesting formal party status, discovery, locations of public and evidentiary hearings, and a schedule for the hearings.
4. Hold Public Information and Scoping meetings in the Project area to gather comments and questions about the Project.
5. Preparation of an environmental review document (i.e., the EIS) by the staff of the OES.
6. Release of Draft EIS for public comment.

7. Public information meetings in the Project area to receive public comment on the draft EIS. Notice of these meetings would be provided by direct mail to interested persons and in display ads in local newspapers.
8. Release of the Final EIS containing responses to comments submitted on the Draft EIS.
9. Public meetings/hearings to receive input and questions from the public
10. Evidentiary hearings to receive testimony from formal parties and to conduct cross-examination of expert witnesses.
11. Filing of post-hearing briefs and findings of fact by the formal parties.
12. Filing of Findings of Fact, Conclusions and Recommendation by the ALJ.
13. Oral argument by the formal parties before the Commission and oral deliberation by the Commission at a public meeting.
14. Issuance of a written decision or order by the Commission.
15. Post-decision activities, possibly including reconsideration and judicial review.

Ways for the Public to Participate in the Route Permitting Process
Members of the public may participate in the following ways:

- By participating in the environmental review process conducted by the OES.
- By offering comments and questions at the public information meetings held after the draft EIS is issued. Written comments may also be submitted to the OES.
- By offering comments at the public hearings held by the ALJ on Project. Members of the public do not have to meet any other prior requirements to be able to participate in these hearings. Written comments may also be submitted to the ALJ assigned to the hearings.

4.3 Other Required Permits and Approvals

In addition to the Certificate of Need and Route Permits issued by the Commission, the Project would require a number of local, state and federal approvals prior to construction.

4.3.1 Local Approvals

Typical local government permits are included Table 4-1, but specific permits may vary from jurisdiction to jurisdiction. However, when the Commission issues a route, permit, zoning, building and land use regulations are preempted per Minnesota Statue 216E.10, subd. 1.

4.3.2 Other State of Minnesota Approvals

A permit from MNDOT is required for construction, placement or maintenance of utility lines that occur adjacent to or across a highway right-of-way. These permits would be acquired once line design was completed.

MN DNR Division of Lands and Minerals regulates utility crossings on, over or under any state land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minnesota Statue 84.415 and Minnesota Rule 6135. Applicants would need to work closely with the DNR on these permits and would file for them once line design was complete.

The DNR Division of Waters regulates activities that affect the course, current and cross-section of lakes, wetlands, rivers and streams. Under Minnesota Statute 103G.245, subd.1, a DNR Public Waters Work Permit is required to:

1. Construct, reconstruct, remove, abandon, transfer ownership of or make any change in a reservoir, dam, or waterway obstruction on public waters; or
2. Change or diminish the course, current, or cross-section of public waters, entirely or partially within the state, by any means, including filling, excavating or placing of materials in or on the beds of public waters.

Applicants would determine cases in each project area where this permit might be necessary and, if needed, would need to file this permit once line design was complete.

A NPDES permit from the MPCA is required for storm water discharges associated with construction activities disturbing an area equal to or greater than one acre. A requirement of the permit is to develop and implement a SWPPP, which includes Best Management Practices to minimize discharge of pollutants from the site.

4.3.3 Federal Approvals

The Project will require several decisions by various federal agencies. In most cases, the agency's decision constitutes a federal action, and thus requires a review of project alternatives and environmental effects under NEPA and implementing regulations.

US Department of Agriculture – Rural Utilities Service (RUS): The Applicant has approached the RUS for financial assistance for the propose action. The initial step in the RUS's determination to finance the proposal is the assessment of potential environmental impacts in accordance with NEPA and the Agency's regulations 7 CFR 1794, as well as Section 106 of the National Historic Preservation Act and its implementing regulations 36 CFR Part 800. Once the environmental review process is complete (in this case, the publication of a Record of Decision, and likely a Programmatic Agreement for Section 106) the proposal may be considered for financing assistance. The overall consideration included detailed engineering review, load forecast studies and loan/financial review.

US Army Corps of Engineers: Approval under Section 404 of the Clean Water Act is required for projects that discharge temporary or permanent fill within a water of the U.S. or within wetlands. Section 10 of the Rivers and Harbors Act of 1899 requires approval prior to the accomplishment of any work in, over or under navigable waters of the United States, or which affects the course, location, condition or capacity of such waters. Other approvals that fall NEPA may also be required where adverse impacts are anticipated.

Chippewa National Forest: The Project would require a Special Use Permit to cross the Chippewa National Forest. The Special Use Permit application requires an environmental analysis of the Project in relation to the Forest Plan and identification of impacts and mitigations. The Permit would outline terms and restrictions on the specific use to protect resources and decrease impacts.

4.4 Environmental Review

Both the certificate of need proceedings and the route permit proceedings require preparation of environmental review documents. The orders accepting the certificate of need (CN-07-1222) and route permit applications (TL-07-1327) called for the environmental reviews and public hearings on the Project to be combined to the extent practicable.

The OES conducted a coordinated scoping and environmental review process for the Applicant's route permit and certificate of need applications. The OES Energy Facilities Permitting (EFP) unit, in conjunction with the RUS, held public information meetings on August 11-15, 2008, in Black Duck, Cass Lake, Deer River, Bemidji and Walker to inform the public about the project and the regulatory proceedings; discuss environmental, social and economic issues of importance in the area potentially affected; and to gather public input into the scope of the environmental documents to be prepared for the project. The meetings provided the public an opportunity to ask questions about the project and to suggest alternatives and specific impacts to address in the environmental review. Approximately 120 people attended the public information meetings. In addition to the oral comments received at the public information meetings, more than 120 written comments were received by the close of the public comment period on September 30, 2008.

After these processes, EFP staff reviewed the public comments on the scope of environmental review for the Project. Based on that review, the Director of the OES issued separate scoping decisions for the certificate of need and route permitting processes. The Scoping Decision for the ER prepared for the certificate of need proceeding under docket CN-07-1222 was issued on March 3, 2009 and is included in Appendix A of this document. Once this ER is complete, public hearings will be held. During the public hearing sessions, members of the public may offer either oral or written testimony, offer exhibits for inclusion in the public hearing record, and ask questions of the Applicants. Members of the public need not become parties or formal participants in order to comment at the public hearings.

The Scoping Decision for the EIS on the route permit proceeding under docket TL-07-1327 was issued on March 31, 2009. The Minnesota Department of Commerce and RUS have entered into a memorandum of understanding to prepare a joint EIS for the proposed project. OES has primary responsibility for managing preparation of the EIS and will coordinate with RUS and other federal agencies to ensure that the EIS developed for this project meets both state and federal environmental review requirements.

Upon completion of the EIS, public hearings will be held. Members of the public will have an opportunity to speak at the hearings, present evidence, ask questions, and submit comments. The hearing for the route permit application will be a contested case hearing presided over by an Administrative Law Judge (ALJ). The ALJ will issue a report containing findings, conclusions, and a recommendation on whether the Commission should issue a route permit for the proposed transmission line.

Environmental Report Resource Materials

Avian Power Line Interaction Committee. www.aplic.org

CapX2020 Utilities. www.capx2020.com

Explore Minnesota. http://www.exploreminnesota.com

Land Management Information Center. www.lmic.state.mn.us

Midwest Independent System Operator. www.midwestiso.org

Minnesota Department of Employment and Economic Development. www.deed.state.mn.us

Minnesota Department of Natural Resources. www.dnr.state.mn.us

Ecological Classification System: http://www.dnr.state.mn.us/ecs/index.html

Minnesota Department of Transportation. www.dot.state.mn.us

Minnesota Historical Society. www.mnhs.org

Minnesota Office of the Revisor of Statutes. www.revisor.leg.state.mn.us/pubs/

Minnesota Pollution Control Agency. www.pca.state.mn.us

Minnesota Office of the Revisor of Statutes. www.revisor.leg.state.mn.us

Natural Resource Conservation Service. www.nrcs.usda.gov

National Park Service. www.nps.gov

Office of Energy Security. www.energy.mn.gov

Public Service Commission of Wisconsin. www.psc.wi.gov

U.S. Census Bureau. www.census.gov

U.S. Code of Federal Regulations. www.gpoaccess.gov/ecfr/

U.S. Department of Agriculture. www.usda.gov

U.S. Energy Information Administration. www.eia.doe.gov

U. S. Environmental Protection Agency. www.epa.gov

U.S. Fish and Wildlife Service. www.fws.gov

U.S. Geological Survey. www.usgs.gov

World Health Organization. www.who.int/en/

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Appendix A. Commissioner's Scoping Decision

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office of energy security
Minnesota Department of Commerce

In the Matter of the Application of Ottertail Power Company, Minnesota Power, and Minnkota Power Cooperative for a Certificate of Need for a 230-kV Transmission Line and Associated System Connections from Bemidji to Grand Rapids, Minnesota

ENVIRONMENTAL REPORT SCOPING DECISION

PUC Docket No. E017, E015, ET-6/ CN-07-1222

The above matter has come before the Director of the Office of Energy Security (OES) for a decision on the content of the Environmental Report (ER) to be prepared in consideration of the Ottertail Power Company, et al., Application for a Certificate of Need for a 230 kilovolt (kV) high voltage transmission line (HVTL) in Minnesota. According to Minnesota Rule 7849.7030:

> The Commissioner of the Department of Commerce shall prepare an environmental report on a proposed high voltage transmission line or a proposed large electric power generating plant at the need stage. The environmental report must contain information on the human and environmental impacts of the proposed project associated with the size, type, and timing of the project, system configurations, and voltage. The environmental report must also contain information on alternatives to the proposed project and shall address mitigating measures for anticipated adverse impacts. The commissioner shall be responsible for the completeness and accuracy of all information in the environmental report.

Because of its size, the project requires both a certificate of need (Docket No. 07-1222) and a route permit (Docket No. 07-1327). When the applications were accepted by the Commission in June, 2008, it was assumed that certain efficiencies could be gained from combining the environmental review processes for the certificate of need and route permit. Since that time, the need and routing processes have shown marked differences in complexity and controversy, leading to a request from Commission staff to separate the environmental review for the project and proceed with a separate ER for the certificate of need. The OES concurs with the Commission staff's assessment of the differences in the two processes and will prepare both an ER to address the need application and an Environmental Impact Statement (EIS) to address the route permit application.

An ER provides a high level environmental analysis of the proposal and system alternatives, and reviews environmental impacts associated with named and alternative project corridors. The ER does not take the place of the EIS that will be prepared to evaluate route alternatives under the route permit proceedings, nor is it comparable in scope. It is only one part of a larger OES

investigation of the Certificate of Need Application. The OES in its overall review will address in detail all the issues and alternatives required by rule.

The OES Energy Facilities Permitting (EFP) Unit held public information meetings on August 11-15, 2008, in Black Duck, Cass Lake, Deer River, Bemidji and Walker to inform the public about the project and the regulatory proceedings; discuss environmental, social and economic issues of importance in the area potentially affected; and to gather public input into the scope of the environmental documents to be prepared for the project. The meetings provided the public an opportunity to ask questions about the project and to suggest alternatives and specific impacts to address in the environmental review. Approximately 120 people attended the public information meetings. In addition to the oral comments received at the public information meetings, more than 120 written comments were received by the close of the public comment period on September 30, 2008.

Although the majority of the comments received related to the routing process, several comments were related to the issue of need and alternatives to the proposed project. Several commenters questioned the need for this project and wanted more information on the reliability concerns the project is proposed to address. Several commenters also wanted to know if the need could be offset by installing more wind generation. Comments related to issues of need and alternative are incorporated in this scope and will be addressed in the ER.

Having reviewed the matter, and having consulted with staff, I hereby make the following Order on the content of the ER:

ENVIRONMENTAL REPORT MATTERS TO BE ADDRESSED

The ER will address the following subjects/matters for the proposed project in fulfillment of the certificate of need requirements:

PROJECT DESCRIPTION

The ER will describe the proposed project, right-of-way requirements, location, purpose, and proposed design.

REGULATORY FRAMEWORK

The ER will describe the regulations and regulatory processes which the project is being reviewed under, including the Certificate of Need, environmental review, and the public participation process.

ALTERNATIVES TO THE PROJECT

The ER will describe and analyze the feasibility of the following alternatives:

- No-build alternative, including demand-side management and conservation measures
- Transmission system alternatives, including existing line or system improvements, and
- Generation alternative

ASSESSMENT OF PROJECT IMPACTS AND MITIGATION

The ER will describe the environmental setting within the project area and analyze the avoidable and unavoidable impacts of and mitigation measures for the proposed project. As appropriate, data may include:

- Impacts on human settlement: socioeconomic, displacement, noise, aesthetics, radio and television interference, archeological and historic resources, human health and safety (including electric and magnetic fields, and safety codes).
- Impacts on land-based economies: recreation, prime farmland, transportation, mining and forestry, and economic development.
- Impacts on natural environment: air quality, water quality (including surface water, groundwater and wetlands), soils and geology, flora and fauna, rare and unique natural resources

PERMITS AND APPROVALS REQUIRED

The ER will describe the federal, state and local permits anticipated to build the project.

ISSUES OUTSIDE OF THE ENVIRONMENTAL REPORT

The ER will not consider the impacts or mitigative measures associated with specific routes within the proposed corridors. Site specific concerns related to specific routes will be addressed in an EIS being prepared for the separate PUC route permit proceeding for this project (Docket No. 07-1327). The ER will only identify the general potential impacts from the construction, operation, and maintenance of the proposed HVTL within the broad geographic area proposed, and the measures generally available to mitigate these potential impacts.

The ER will not review impacts of specific energy sources that may generate the power carried on the project, such as carbon outputs from coal-generated facilities or environmental impacts from a wind generation installation. The proposal is a transmission line designed and proposed, as stated, to maintain the reliability of the transmission system currently serving the Bemidji area in north central Minnesota, as well as maintaining regional transmission reliability for the larger northwestern Minnesota and eastern North Dakota region. This transmission line is not directly associated with any particular energy source.

STATE & FEDERAL COORDINATION ON ENVIRONMENTAL IMPACT STATEMENT

Minnesota Rule 4410.3900 anticipates coordinating state and federal review where possible. The OES, through the Department of Commerce, has entered into a Memorandum of Understanding with the Rural Utilities Service to prepare an EIS to meet both federal and state requirements. OES will prepare both an ER and EIS for the Project to meet the state requirements. OES anticipates continued cooperation with RUS on the EIS being prepared for the route permit proceedings.

SCHEDULE

The ER shall be completed by April, 2009.

Signed this 3rd day of March, 2009

STATE OF MINNESOTA
OFFICE OF ENERGY SECURITY

William Glahn, Director

Appendix C. Figures

Figure C-1: H-Frame Structure

Figure C-2: Single-Pole Single Circuit Structure

Figure C-3: Single Pole Double Circuit Structure

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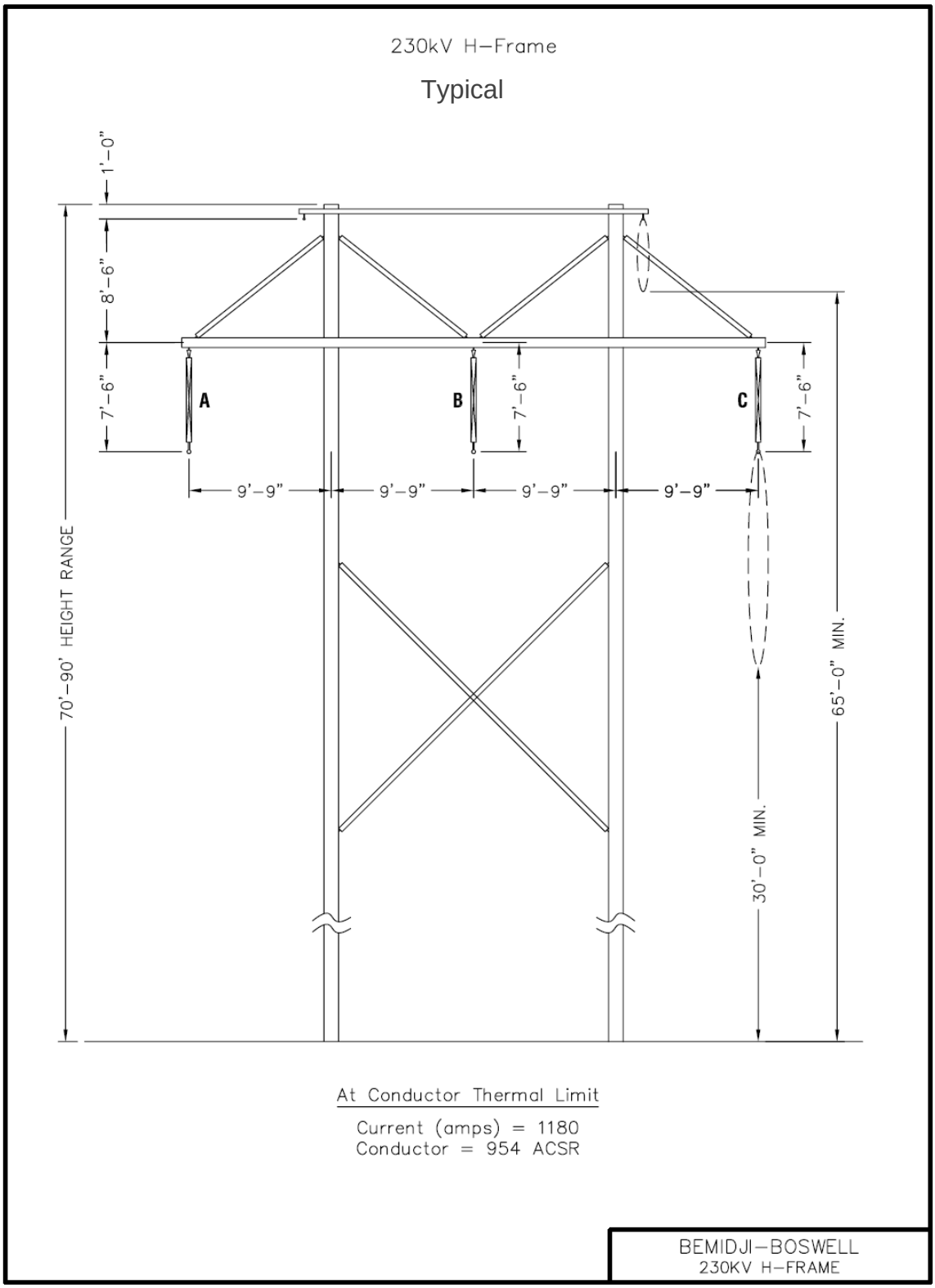

Figure C-1: H-Frame Structure

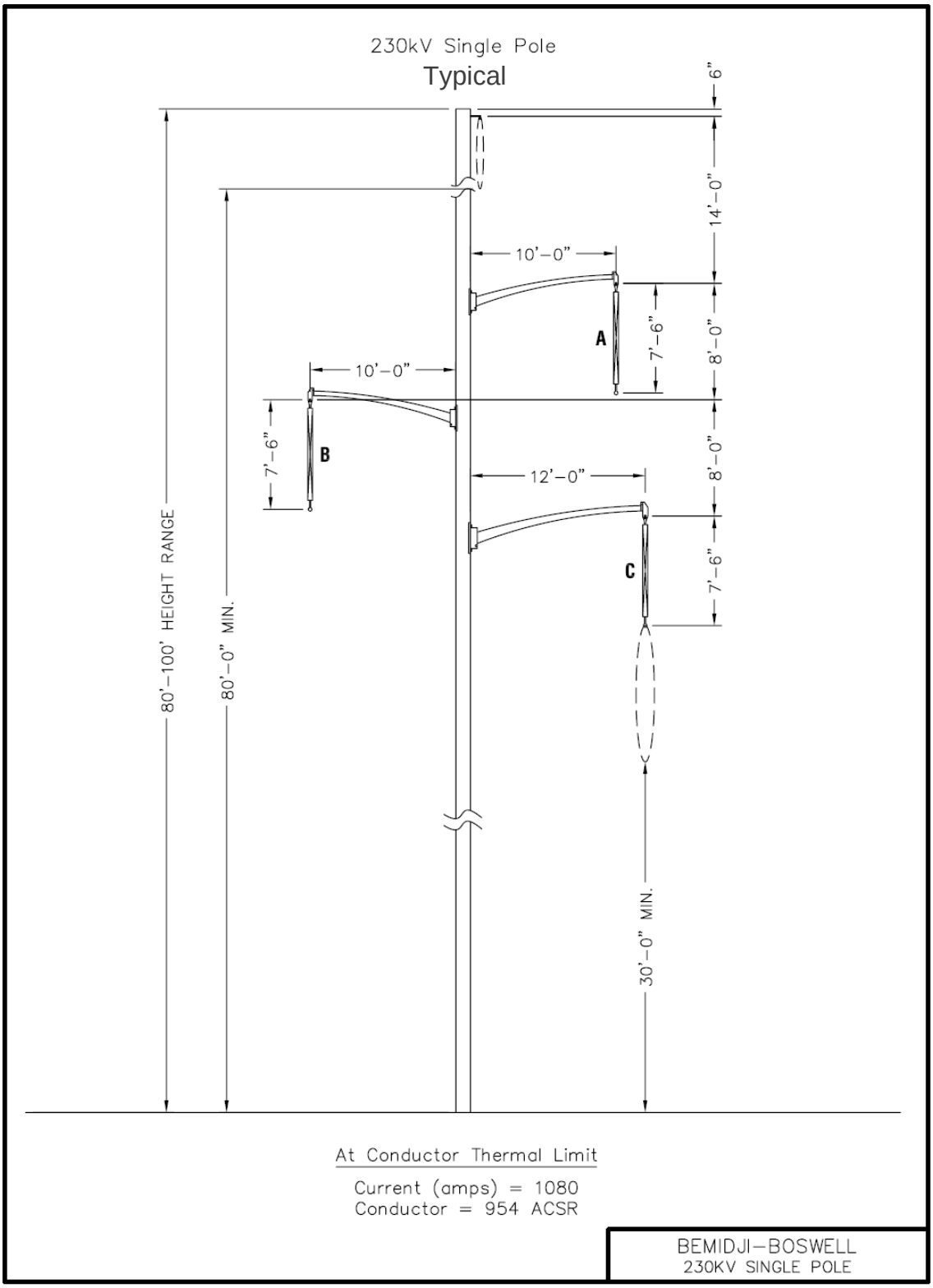

Figure C-2: Single-Pole Structure

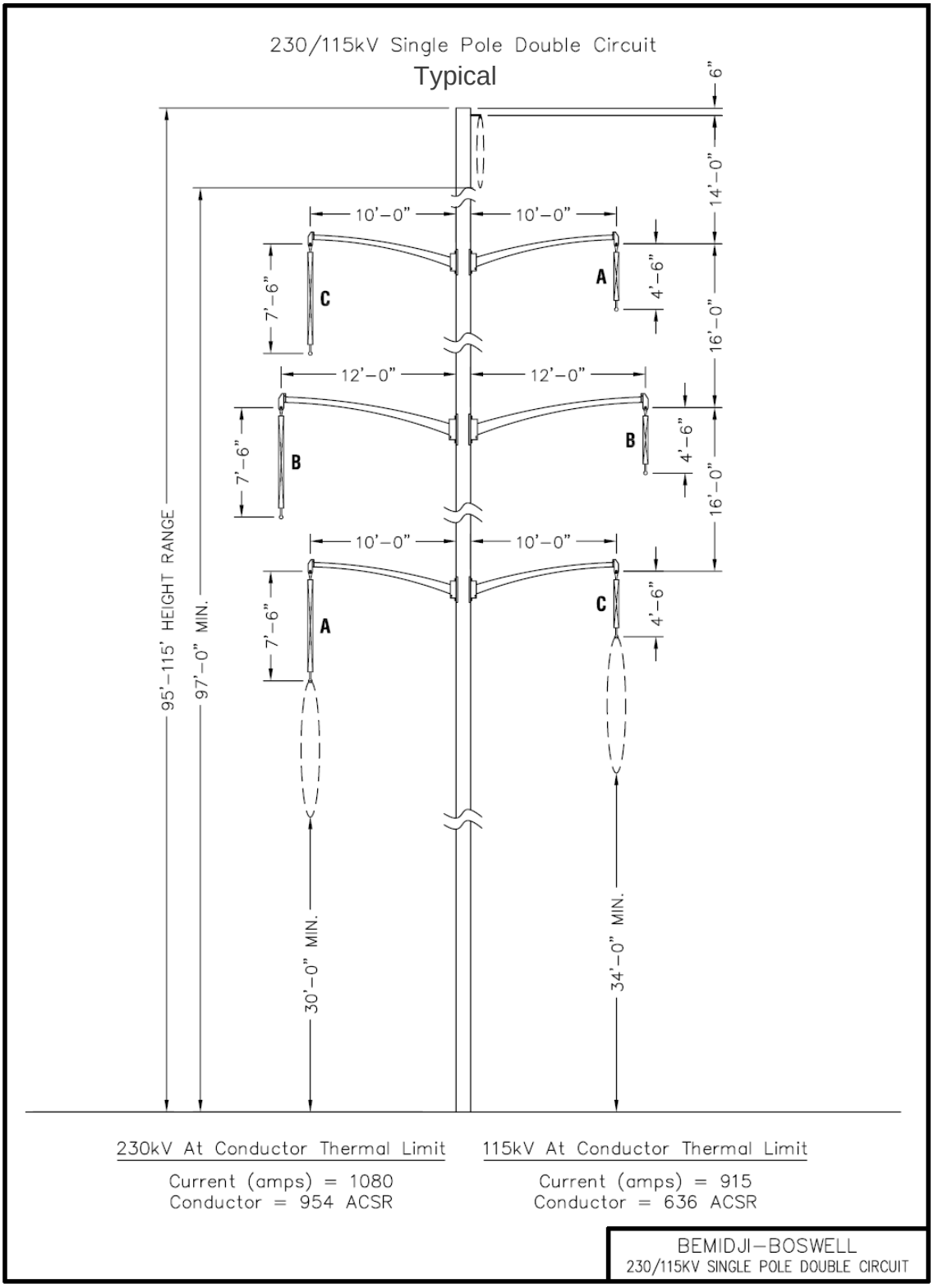

Figure C-3: Single-Pole Double Circuit Structure