WINTHROP & WEINSTINE

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May 15, 2014

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VIA E-FILING AND U.S. MAIL

The Honorable Ann O'Reilly
Office of Administrative Hearings
P.O. Box 64620
St. Paul, MN 55164-0620

RE: In the Matter of the Request of Minnesota Power for a Certificate of Need for the Great Northern Transmission Line Project
MPUC Docket No. E-015/CN-12-1163
OAH Docket No. 65-2500-31196

Dear Judge O'Reilly:

Enclosed please find Section 5 of Minnesota Power's Route Permit Application ("Application") which was filed on April 15, 2014 in Minnesota Public Utilities Commission Docket No. E-015/TL-14-21. Please note that Section 5 of the Application contains updated capital cost information relevant to the Certificate of Need docket and supplementing the information set forth in Section 4.3.1. of the Certificate of Need Application, filed on October 21, 2013. This document has been filed with the E-Docket system and served on the attached service list. Also enclosed is our Affidavit of Service.

Very truly yours,

WINTHROP & WEINSTINE, P.A.

/s/ Eric F. Swanson

Eric F. Swanson

Enclosures

9080516v1

BEFORE THE MINNESOTA OFFICE OF ADMINISTRATIVE HEARINGS
600 North Robert Street
St. Paul, Minnesota 55101

FOR THE MINNESOTA PUBLIC UTILITIES COMMISSION
121 Seventh Place East, Suite 350
St. Paul, Minnesota 55101-2147

In the Matter of the Request of Minnesota Power for a Certificate of Need for the Great Northern Transmission Line Project	MPUC Docket No. E-015/CN-12-1163 OAH Docket No. 65-2500-31196

AFFIDAVIT OF SERVICE

STATE OF MINNESOTA)
) ss.
COUNTY OF HENNEPIN)

Mary G. Holly, of the City of Lake Elmo, County of Washington, the State of Minnesota, being first duly sworn, deposes and says that on the 15th day of May, 2014, she served the attached **Section 5 of the Route Permit Application** to all said persons on the attached Service List, true and correct copies thereof, by E-Filing and/or by depositing the same enclosed in an envelope, postage prepaid in the United States Mail in the post office at Minneapolis, Minnesota.

/s/ Mary G. Holly
MARY G. HOLLY

Subscribed and sworn to before me this
15th day of May, 2014.

/s/ Jennifer Lynn Flynn
Notary Public

My Commission Expires: January 31, 2015

9080602v1

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5.0 Project Description

The Applicant's Great Northern Transmission Line includes a 500 kilovolt (kV) alternating current (AC) transmission line between the Minnesota-Manitoba border crossing northwest of Roseau, Minnesota and the existing Blackberry Substation near Grand Rapids, Minnesota, as well as associated substation facilities and transmission system modifications at the existing Blackberry Substation site, and a 500 kV series compensation station (Project) (see Section 1.0, Introduction, Figure 1-1). The new substation facilities required for the Project (Blackberry 500 kV Substation) will be constructed adjacent to and east of the existing Blackberry 230/115 kV Substation. The transmission line is expected to carry at least 750 MW to facilitate agreements and transmission service requests between Minnesota Power and Manitoba Hydro plus exports and transmission service requests by Manitoba Hydro to other utilities. Minnesota Power's agreements are for 383 megawatts (MW) by June 1, 2020 to meet the requirements of the Applicant's 250 MW Power Purchase Agreement (PPA) and 133 MW Renewable Optimization Agreement with Manitoba Hydro. In addition to meeting the Applicant's needs and Manitoba Hydro's exports to other utilities, the Project will support the regional electric grid.

In addition to its energy benefits, the Project will bring economic and fiscal benefits to the State of Minnesota during construction and ongoing benefits once the Project is operational. Based on preliminary estimates, hundreds of direct construction jobs in Minnesota, as well as professional and technical services jobs, will be supported during the Project's 3+ year construction phase. Through the multiplier effects from the direct and indirect expenditures, additional economic activity in retail, services, and other sectors also is expected, adding millions of dollars to household earnings each year during the construction phase. Once the Project is operational, it will add to the tax base for both the state of Minnesota and the local governments in the jurisdictions where the Project will be built.

5.1 Route and Segment Descriptions

The following provides a detailed description of the proposed locations for the Route Alternatives and Segment Options. Appendix A includes detailed figures that illustrate the routes. See Figure 5-1 for Border Crossing location and ownership.

5.1.1 Orange Route

The Orange Route crosses the Minnesota-Manitoba border in Section 25, Township 164N, Range 42W in Roseau County and continues south for approximately 2.5 miles. The Orange Route then heads east for 11 miles to Minnesota TH 310. From Section 2, Township 163N, Range 40W, the Orange Route proceeds southeast for 12 miles to Section 26, Township 163N, Range 38W. From there, the Orange Route continues east for 2.5 miles to the existing Minnkota Power 230 kV transmission line. The Orange Route follows the 230 kV transmission line southeast for 1.75 miles to the existing Xcel Energy 500 kV transmission line. From this point, the Orange Route follows the existing Xcel Energy 500 kilovolt (kV) transmission line to Section 25, Township 157N, Range 31W. The Orange Route then heads south for 4.75 miles to Section 24, Township 156N, Range 31W. The Orange Route then heads east for 0.5 mile, crossing TH 72, then southeast for 10.5 miles to Section 21, Township 155N, Range 29W. The Orange Route continues south for 16.0 miles to Section 9, Township 152N, Range 29W. From there, the Orange Route continues east for 12.0 miles to Section 8, Township 152N, Range 27W. The Orange Route then heads southeast for 13.0 miles to Section 5, Township 151N, Range 25W. The Orange Route then continues east for 5.0 miles, southeast for 4.25 miles, and then east for 4.0 miles to Section 11, Township 162N, Range 62W. The Orange Route then heads southeast for 5.5 miles, crossing TH 1, to Section 1, Township 161N, Range 26W. The Orange Route then heads east for 6.0 miles to Section 6, Township 161N, Range 24W. The Orange Route then proceeds southeast for 11.5 miles to Section 3, Township 60N, Range 23W. The Orange Route then heads south for 15.0 miles, staying east of Bear Lake and Wolf Lake, to Section 15, Township 58N, Range 23W. From there, the Orange Route continues southwest, utilizing an old Minnesota Power right-of-way (ROW) to Section 26, Township 58N, Range 24W. The Orange Route then heads south, between Bass Lake and Lawrence Lake, to Section 11, Township 56N, Range 24W. From there, it follows an existing 115 kV transmission line south to Section 23, Township 56N, Range 24W. The Orange Route continues southeast, between Holman Lake and South Twin Lake, for 4.0 miles to Section 5, Township 55N, Range 23W. From there, the Orange Route heads south for 1.0 mile to the existing Minnesota Power 115 kV transmission line. The Orange Route follows the existing 115kV transmission line southwest and then south to the new substation location (see Appendix A, sheets 1-15, 55-77, and41-54).

5.1.2 Blue Route

The Blue Route crosses the Minnesota-Manitoba border in Section 25, Township 164N, Range 42W in Roseau County and continues south for approximately 2.5 miles. The Blue Route then heads east for 11 miles to Minnesota TH 310. From Section 2, Township 163N, Range 40W, the Blue Route proceeds southeast for 12 miles to Section 26, Township 163N, Range 38W. From there, the Blue Route continues east for 2.5 miles to the existing Minnkota Power 230 kV transmission line. The Blue Route follows the Minnkota Power 230 kV transmission line southeast for 1.75 miles to the existing Xcel Energy 500 kV transmission line. The Blue Route follows the Xcel Energy 500 kV transmission line to the south and east for 36.0 miles to Section 29, Township 160N, Range 33W. The Blue Route stops following the Xcel Energy 500 kV transmission line and continues east for 6.0 miles, then northeast for 1.0 mile to Section 28, Township 160N, Range 32W. From there, the Blue Route follows the existing Minnkota Power 230 kV transmission line east for 31.0 miles to Section 9, Township 159N, Range 27W. At this point, the Blue Route stops following the Minnkota Power 230 kV transmission line and heads southeast for 8.0 miles to Section 22, Township 158N, Range 27W. The Blue Route continues to the southeast, cross-country, for 32 miles to the Minnesota Power 230 kV transmission line in Section 6, Township 65N, Range 25W. From this point, the Blue Route follows the Minnkota Power 230 kV transmission line south for 12.5 miles to Section 7, Township 63N, Range 25W. The Blue Route continues south for 2.5 miles to Section 19, Township 63N, Range 25W. The Blue Route then heads east for 3.5 miles to Section 22, Township 63N, Range 25W; southeast for 5.0 miles to Section 5, Township 62N, Range 24W; and then south for 7.0 miles to Section 8, Township 61N, Range 24W. The route then goes southeast for 14.0 miles, between Bass Lake and Larson Lake, to Section 4, Township 59N, Range 23W. From there, the Blue Route heads south for 14.0 miles, between Bray Lake and Thirty Lake, to Section 17, Township 58N, Range 23W. The Blue Route then heads southwest for 3.5 miles to Section 26, Township 57N, Range 24W and then south to Section 2, Township 56N, Range 24W. From there, the Blue Route follows the existing 115 kV transmission line south to U.S. Highway 169. The Blue Route crosses U.S. Highway 169 and then heads southeast to Section 26, Township 56N, Range 24W. The Blue Route then heads south for 4.0 miles to the existing Minnesota Power 230 kV transmission line. The Blue Route follows the Minnesota Power 230 kV transmission line east for 1.0 mile to the new substation location (see Appendix A, sheets 1-54).

5.1.3 Segment Options

Segment Option C1

Segment Option C1 begins in Section 22, Township 158N, Range 27W. This segment continues to the southeast, cross-country, for 32 miles to the Minnesota Power 230 kV transmission line in Section 6, Township 65N, Range 25W (see Appendix A, sheets 24-32).

Segment Option C2

Segment Option C2 begins in Section 22, Township 158N, Range 27W and follows the Minnkota and Minnesota Power 230 kV transmission line east and then south for 47.0 miles to Section 6, Township 65N, Range 25W (see Appendix A, sheets 78-87).

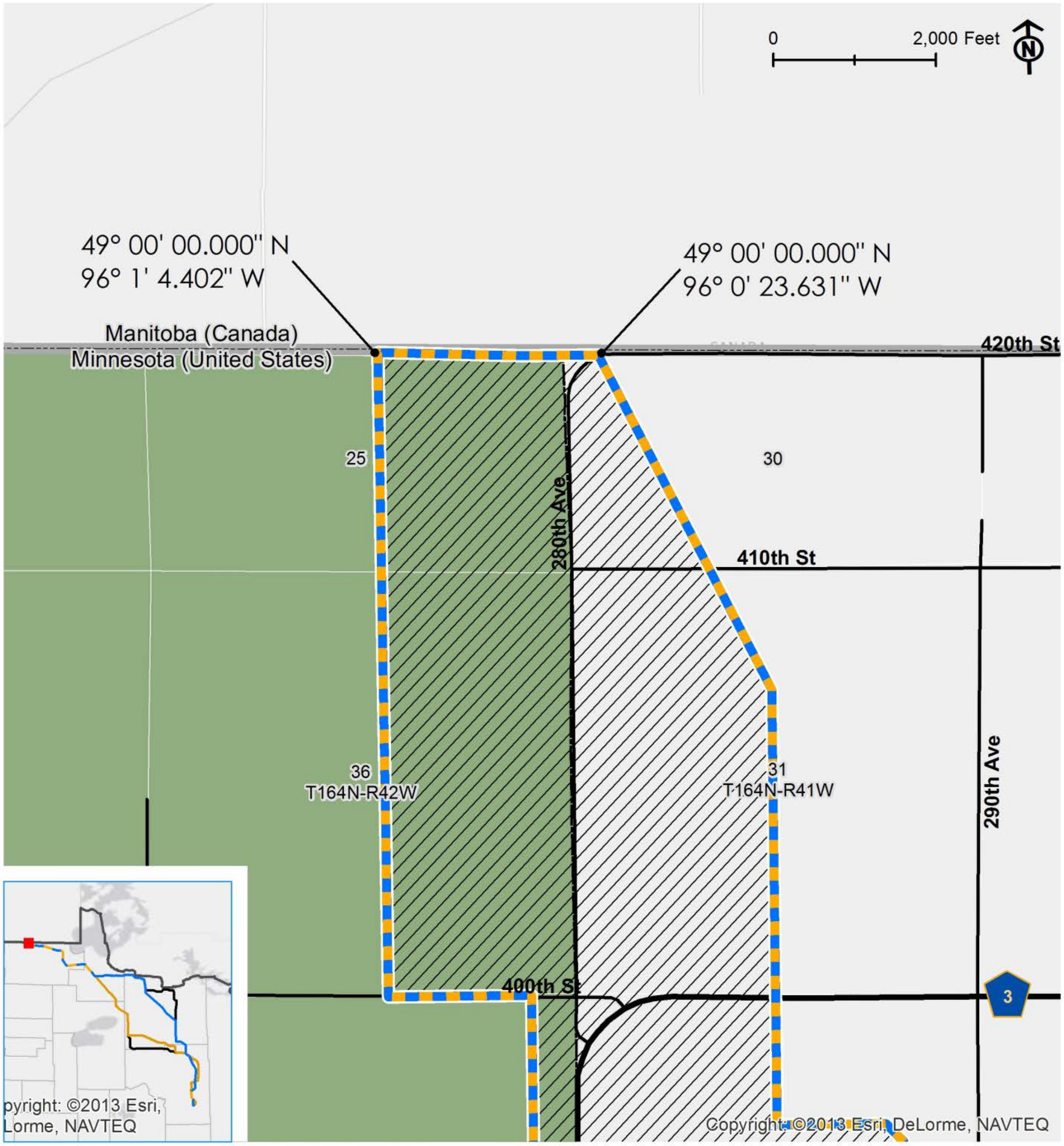
Segment Option J1

Segment Option H1 begins in Section 9, Township 152N, Range 29W. From there, Segment Option H1 heads east for 12.0 miles to Section 8, Township 152N, Range 27W. It then heads southeast for 13.0 miles to Section 5, Township 151N, Range 25W. Segment Option H1 continues east for 5.0 miles; southeast for 4.25 miles; and east for 4.0 miles to Section 11, Township 162N, Range 62W. Segment Option H1 then heads southeast for 5.5 miles, crossing TH 1, to Section 1, Township 161N, Range 26W. Segment Option H1 then heads east for 6.0 miles to Section 6, Township 161N, Range 24W. Segment Option H1 proceeds southeast for 5.0 miles to Section 8, Township 61N, Range 24W (see Appendix A, sheets 69-77).

Segment Option J2

Segment Option H2 begins in Section 9, Township 152N, Range 29W. It heads southeast for 2.5 miles; south for 6.0 miles; and then southeast for 2.0 miles to Section 36, Township 151N, Range 29W. Segment Option H2 then heads east for 26.0 miles to Section 24, Township 62N, Range 27W. It then heads southeast for 3.0 miles, crossing TH 1. Segment Option H2 then heads east for 2.0 miles, crossing TH 38, then southeast for 2.0 miles to Section 1, Township 61N, Range 26W. Segment Option H2 heads east for 6.0 miles to Section 6, Township 161N, Range 24W. It then heads southeast for 5.0 miles to Section 8, Township 61N, Range 24W (see Appendix A, sheets 87-94).

Border Crossing Figure 5-1



Legend

- Border Crossing Area
- Blue Route
- Orange Route
- State Land
- International Boundary
- City / Township Boundary

Sources: ESRI,DNR, MnDOT

\\mspe-gis-file\gisprojlarge\MinnPower\182035\map_docs\CLIENT\Route_Permit\05-1_Border_Crossing.mxd

5.2 Technical Description

5.2.1 Number Circuits

The Applicant proposes to construct a single-circuit 500 kV AC overhead transmission line.

5.2.2 Operating Voltage and Frequency

The nominal three phase operating voltage for the Project will be 500 kV AC. The Project will be operated at a frequency of 60 Hertz (Hz).

5.2.3 Conductor Specifications

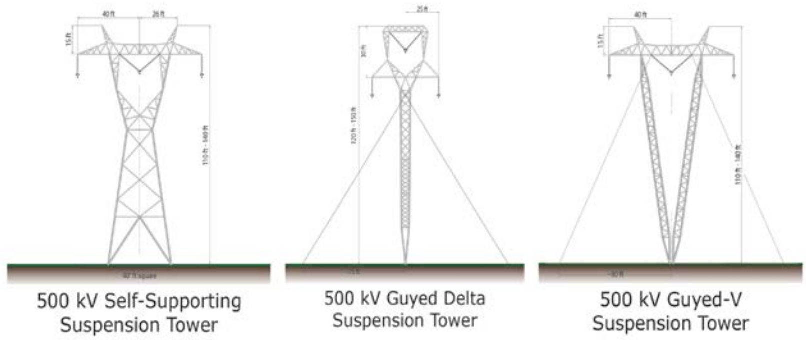
The Applicant anticipates using 3-conductor bundle 1192.5 kcmil Aluminum Conductor Steel Reinforced (ACSR) "Bunting" with 18 inch sub-spacing as the phase conductor for the Project. This conductor bundle is the same as that used on the United States portion of the existing Dorsey–Chisago 500 kV transmission line. The Applicant will perform a conductor optimization study before a final determination is made on conductor selection and bundle configuration.

5.2.4 Typical Supporting Structure

The Applicant is evaluating several structure types and configurations for the Project to accommodate variations in terrain and land use. The structure details provided are typical of these structure types (see Figure 5-1 and Appendix D).

The Applicant continues to evaluate several structure types and configurations that will be used for the Project, including: a self-supporting lattice structure, a lattice guyed-V structure, and a lattice guyed delta structure. The Applicant currently estimates approximately 4 to 5 structures per mile of transmission line. The type of structure in any given section of transmission line will be dependent on land type and land use. The Project structures will typically range in heights from approximately 100 feet above ground to approximately 150 feet above ground, depending on the structure type and the terrain. In some instances, such as where the Project crosses an existing transmission line, taller structures may be required. In cultivated lands or in areas of intensive land use, the Applicant anticipates utilizing self supporting lattice structures for the Project. In other areas where guy wires will not significantly interfere with land use, the Project may be installed on one of the guyed structure types.

Figure 5-2. Structure Schematics



Typical Spans:
1,000 ft - 1,450 ft
Right-of-way:
200 ft

Typical Spans:
1,000 ft - 1,450 ft
Right-of-way:
200 ft

The self-supporting lattice structures will be anchored to foundations at each leg of the structure. The guyed-V structure and the guyed-delta structure will utilize a single foundation system at the center of the structure and a set of at least four guys and anchors. The anchors used will vary depending on terrain.

The Applicant anticipates using either a single I-string or a V-string insulator assembly. The structures will support two overhead static ground wires to protect from lightning. In each case, one of the overhead static ground wires will have a fiber optic core to enable communications and system protection functions between the two endpoints.

5.2.5 Structure Spacing

The Applicant anticipates that the Project typically will be located on all new ROW that is approximately 200 feet wide. A wider ROW may be required for longer spans of the Project, at angle and corner structures, for guyed structures, or where special design requirements are dictated by topography. Generally, structures will be spaced approximately 1,000 to 1,450 feet apart, with shorter or longer spans as necessary.

5.2.6 Conductor Spacing

Lateral spacing of phase conductor bundles will vary with the various types of structures and will range from approximately 25 to 40 feet.

5.2.7 Line to Ground and Conductor Side Clearances

The required clearances at the structure, horizontal distance between each energized phase, and the minimum required ground clearance will be determined based on electrical studies in the design phase of the Project. All clearances will meet or exceed the recommended clearances in the National Electrical Safety Code (NESC). Based on preliminary design criteria for the Project, minimum ground clearance for the conductors is estimated to be 40 feet

5.2.8 Wind and Ice Loading

Wind and ice loading for the proposed Project will incorporate three National Electrical Safety Code (NESC) loading cases required for this area of the U.S. These cases are Rule 250B, Rule 250C, and Rule 250D. Rule 250B is the NESC heavy district loading case. It specifies a wind velocity of 40 miles per hour (mph), 0.5 inch of ice, and a wire temperature of 0 degrees Fahrenheit (°F). This loading case requires an additional NESC constant of 0.3 pounds per foot for the sag and tension calculations. Rule 250C considers extreme wind loading. A wind velocity of 90 mph at 60 degrees F is the weather condition that satisfies the NESC Rule 250C loading. Rule 250D is a loading case that considers an extreme ice load with a concurrent wind load. For the study area, an ice thickness of one-half inch , a wind gust speed of 50 mph and a wire temperature of 15 °F satisfies the conditions of NESC Rule 250D. NESC Rules 250C and 250D, as well as American Society of Civil Engineers (ASCE) Manual No. 74: "Guidelines for Electrical Transmission Line Structural Loading," provide default 50-year values for extreme ice and wind. A weather study will be performed to identify additional reliability-based wind and ice load cases to be considered in the final design of the Project.

5.3 Interconnection and Substation Description

5.3.1 Blackberry 500 kV Substation

The Project will terminate at a new substation (Blackberry 500 kV Substation) located on the same site as the Applicant's existing Blackberry 230/115 kV Substation (see Appendix A, sheet 54). The Blackberry 500 kV Substation will be located adjacent to and east of the existing substation, and will be designed to accommodate the new 500 kV line, 500/230 kV transformation, existing 230 kV lines, and all associated 500 kV and 230 kV equipment. Existing 230 kV and 115 kV transmission lines currently located on the property will need to be rerouted to accommodate the placement and electrical interconnection of the Blackberry 500 kV Substation.

5.3.2 500 kV Series Compensation Station

The Project will also require a 500 kV Series Compensation Station, which will be located within or adjacent to the final approved route. The 500 kV Series Compensation Station will include the 500 kV series capacitor banks necessary for the reliable operation and optimal performance of the Project, and all associated 500 kV equipment. The location of this facility will be determined by several factors that impact the design of the transmission line and the series capacitor equipment, including the voltage profile along the transmission line and the available fault current at the series capacitors. Since both of these factors are directly impacted by the overall length of the line between the Dorsey Substation in Manitoba and the Blackberry 500 kV Substation in Minnesota, the final location of the 500 kV Series Compensation Station is dependent on the final route determinations in both Canada and the United States. The Applicant has initiated electrical design optimization studies to identify generally what is the preferred location of the 500 kV Series Compensation Station. Based on these studies, candidate sites in Minnesota include the overall midpoint of the line and at one-third of the overall transmission line distance from Blackberry to Dorsey. The Applicant will provide more information on these studies and preferred location of the series capacitor equipment when available.

5.4 Bulk Power System Information

5.4.1 Expected Power Transfer Capability

The Project is designed to increase the total transfer capability between Manitoba and the United States by at least 750 MW. 10 C.F.R. Section 205.322(b)(3)(i). The Applicant will supplement this information after completion of additional MISO system impact studies.

5.4.2 System Power Flow

DOE regulations for a Presidential Permits require system power flow plots for the Applicant's proposed service areas for heavy summer and light spring load periods, with and without the proposed international interconnection, for the year the Project is scheduled to be placed in service and for the fifth year thereafter. 10 C.F.R. Section 205.322(b)(3)(ii). Initial power flow plots for the years 2020 and 2025, before and after development of the Project are included in Appendix K of the Presidential Permit application. Additional information required under the applicable DOE regulations is found in other sections of the Application or will be developed later in accordance with DOE guidance. The Applicant will provide DOE any additional required information as set forth under 10 C.F.R. Section 205.322(b)(3)(v).

5.4.3 Interference Reduction Data

Direct and indirect impacts of the Project on Radio, Television, and Cellular Telephone signals are addressed in detail in Section 6.14, Radio, Television, and Cellular Telephone. This information is required under applicable DOE regulations. 10 C.F.R. Section 205.322(b)(3)(iii).

Electrical interference associated with the Project will be considered in the final determination of the conductor configuration. Radio and television interference is generated by corona occurring on the conductors. The conductor size and bundle configuration for the Project will be selected to minimize corona levels, which in turn will minimize radio and television interference. The design of this high voltage transmission line (HVTL) will use extra high voltage (EHV) hardware, appropriate construction techniques, and a line configuration that yields a low level of corona that will minimize the onset of gap discharges, which in turn avoids any unacceptable level of television interference. The substation design standards will also be formulated to minimize corona, to the extent feasible.

5.4.4 Relay Protection

The Project's protective relaying systems will use microprocessor based devices that conform to the requirements of the Applicant, the Institute for Electrical and Electronics Engineers, the North American Electric Reliability Corporation (NERC), and the Midwest Reliability Organization. 10 C.F.R. Section 205.322(b)(3)(iv). Specific protection schemes, equipment, and functional devices will be determined during the Project's detailed design phase.

5.5 Land Acquisition

5.5.1 Transmission Line Right-of-Way

This project will generally require a new 200-foot-wide right-of-way (ROW) to accommodate the transmission line. For high-voltage transmission lines (HVTL), utilities acquire easement rights across certain parcels to accommodate the facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation, and purchase. Each of these activities, particularly as it applies to easements for HVTL facilities, is described in more detail below.

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

After owners are identified, a ROW representative will contact each property owner or the property owner's representative. The ROW agent will explain the need for the transmission facilities and how the Project may affect each parcel. The ROW agent will also obtain from the landowner information about any specific construction concerns.

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

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

Prior to the acquisition of easements of property, land value data will be collected. Based on the impact of the easement or purchase to the market value of each parcel, a fair market value offer will be developed. The ROW agent will contact the property owner to present the offer for the easement and discuss the amount of just compensation for the rights to build, operate, and maintain the transmission facilities within the easement area and reasonable access to the easement area. The agent will also provide maps of the transmission line easement or site and maps showing the landowner's parcel. The landowner is allowed a reasonable amount of time to consider the offer and to present any material that the owner believes is relevant to determining the property's value and the value of the easement.

In nearly all cases, utilities are able to work with the landowners to address their concerns and an agreement is reached for the utility's purchase of land rights in the form of an easement. The ROW agent will prepare the easements required to complete each transaction. In those instances where a negotiated settlement cannot be reached, the landowner may choose to have an independent third party determine the value of the rights taken. Such valuation is made through the utility's exercise of the right of eminent domain pursuant to Minnesota Statutes, Chapter 117. The process of exercising the right of eminent domain is called condemnation.

Before commencing a condemnation proceeding, the ROW agent must obtain at least one appraisal for the property on which the proposed easement is to be acquired and a copy of that appraisal must be provided to the property owner in accordance with Minnesota Statutes Section 117.036, subdivision 2(a). The property owner may also obtain another property appraisal and the company must reimburse the property owner for the cost of the appraisal according to the limits set forth in Minnesota Statutes Section 117.036, subdivision 2(b). The property owner may be reimbursed for reasonable appraisal costs up to $1,500 for single-family and two-family residential properties, $1,500 for property with a value of $10,000 or less, and $5,000 for other types of properties.

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

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

5.5.2 Substation Property

New land has been secured adjacent to and east of the Applicant's existing Blackberry 230/115 kV Substation to accommodate the Blackberry 500 kV Substation (see Appendix A, sheet 54). Property for the Blackberry 500 kV Substation will be purchased outright, rather than as an easement. The Applicant has entered a purchase option agreement with the owner of the property adjacent to and east of the existing Blackberry 230/115 kV Substation. Execution of a land purchase at this location will provide a definite end point for the Project.

Additional property will also be required for the Project's 500 kV Series Compensation Station. Based on electrical design optimization studies and route selection, the Applicant will identify candidate sites within or adjacent to the proposed Route Alternatives. At that time, the Applicant may seek to obtain a purchase option agreement with the owners of the identified properties. Upon final route determination, a land purchase will be executed for the appropriate site for the 500 kV Series Compensation Station.

5.6 Preconstruction Activities

Preconstruction activities include preparation and approval of the Certificate of Need and the Route Permit applications, completing the required environmental review and surveys, coordinating and obtaining all other necessary permits and approvals, performing the studies, surveys, and engineering necessary for the design of all transmission line and substation facilities, and acquiring ROW easements.

5.7 Construction Procedures

5.7.1 Transmission Line

Once access to the land is granted, preparation of the ROW for construction begins in coordination with landowners. Underground utilities would be identified and located in cooperation with local utility companies to minimize conflicts with the existing utilities along the route. Preparation for construction begins with development of access points from existing roads. Clearing of all woody vegetation and brush within the 200-foot-wide ROW will be required to facilitate the safe and efficient construction, operation, and maintenance of the Project. A reasonably level access path is required to provide for safe passage of construction equipment. At structure locations, a stable working surface free of tripping hazards is required for installation of foundations and guy anchors, as well as assembling and erecting structures.

Vegetation will be cut at or slightly above the ground surface. Rootstock will be left in place to stabilize existing soils and to regenerate vegetation after construction. With the approval of the landowner or land manager, stumps of tall-growing species will be treated with an approved herbicide to discourage re-growth. Merchantable timber typically is cut to standard log lengths and stacked along the ROW. Vegetation clearing debris (that is, unmerchantable trees, brush, and slash) may be cut and scattered, placed in windrow piles, chipped, or burned, depending on location.

To minimize the potential for tire and chassis damage to construction equipment, and to maintain a safe, level access path and structure installation area, incidental stump removal will occur. Stumps that interfere with the placement of mats or movement of construction equipment will be ground down to a point at or slightly below ground level. Stump grinding equipment will mix woody material with soils. This mixture will be evenly spread in the vicinity of the stump to a depth that will allow existing low-growing vegetation to re-establish.

If temporary removal or relocation of fences is necessary, the installation of temporary or permanent gates will be coordinated with the landowner. The ROW agent will work with landowners for early harvest of crops, where possible. During the construction process, the

Applicant may ask the property owner to remove or relocate equipment and livestock from the ROW.

Transmission line structures generally are designed for installation at existing grades. However, if vehicles or installation equipment cannot safely access or operate near the structure, minor grading of the immediate terrain will be performed to provide a reasonable level working surface for construction and maintenance of the structure.

Environmentally sensitive areas or areas susceptible to soil erosion will require special construction techniques. These techniques may include the use of low ground pressure equipment, matting, terracing, water bars, bale checks, rock checks, or temporary mulching and seeding of disturbed areas exposed during long periods of construction inactivity. Permanent soil erosion control measures may include permanent seeding, mulching, erosion control mats, or other measures depending on site conditions. Temporary silt fence, sedimentation ponds, and other measures may be utilized to prevent sediment from running off into wetlands or other surface waters.

Construction equipment will be inspected frequently to ensure hydraulic systems and oil pans are in good condition and free of significant leaks. Portable spill containment kits will be required for each piece of construction equipment with the potential to discharge a significant amount of oil to the environment. Operators will be present at the nozzle at all times when refueling is in progress. In the event of a spill, the source of the spill will be identified and contained immediately upon discovery. The spill and contaminated soils will be collected, treated, and disposed of in accordance with all applicable federal, state, and local requirements. If a significant spill were to occur to surface waters, methods to contain and recover released material such as floating booms and skimmer pumps would be used. Noticeably contaminated soils will be excavated, placed on, and covered by plastic sheeting in bermed areas. An emergency response contractor will be secured, if necessary, to further contain and clean up a severe spill. Refueling of equipment in wetlands will not be permitted.

In the event that protected species or cultural and historical artifacts are encountered during construction activities, project management personnel will consult with regulatory authorities regarding appropriate construction procedures and mitigation measures, which will be determined through applicable regulatory procedures.

Construction materials will be hauled either directly from the local highway or railroad network to structure sites, or brought first to material staging areas and then to the structure sites. The transmission line components, including the structures, conductor, and hardware, normally are brought to the temporary staging areas on flatbed trucks. These materials are stored until needed and then loaded on flatbed trailers or special structure trailers for delivery to the structure site where they are unloaded for installation.

A stable working surface is required at structure locations. Matting is commonly are used to provide a working surface in unstable soils. Structures may be site-assembled and erected or flown into position from a remote staging area.

Where reinforced concrete foundations are required, large rubber-tired or track-mounted auger equipment is used to excavate a circular hole of the appropriate diameter and depth. In upland areas, excavated material will be spread evenly around the structure base to promote site drainage. Reinforcing steel and anchor bolts are set in position. Ready-mixed concrete is then placed in the excavation. In wetland areas, a telescoping temporary steel caisson will be placed in the foundation hole to stabilize the soil walls. Concrete is placed in the excavation using the tremie method. Water pumped from the excavation will be appropriately filtered prior to discharge at the site or placed into tanker trucks or empty concrete trucks and hauled away to a specially designated upland disposal area, or brought back to the concrete batch plant for discharge. Concrete truck washwater will be discharged only in specially designated upland disposal areas or at the concrete batch plant.

After the concrete is poured, the steel caisson is removed. In some situations, a permanent caisson may be required to stabilize the excavation. During drilling, a minimal amount of granular material (from an outside source) will be placed in the area between the caissons and the matting (if required at that location) to provide safe footing for construction personnel. During final restoration, the granular material is leveled or removed to restore the original ground contours for re-vegetation of native species. After the foundation concrete is placed, excess excavated materials will be transported to a suitable upland site by truck for disposal. After allowing adequate curing time, the baseplate structures are bolted to the concrete foundations.

Where augured or driven piling foundations are required, as well as temporary and permanent guy anchors, large rubber-tired or track-mounted pile driving equipment is used to install the foundation. Additional fixtures or a concrete pile cap may also be attached to the piling foundation as necessary for structure setting. Piling foundations generally result in little or no generation of spoils or dewatering requirements.

The wire stringing process starts in a set-up area prepared to accommodate the stringing equipment and materials, normally located near mid-span on the centerline of the ROW. The rope machine, new conductor wire trailers, and tensioner are located at the wire stringing set-up area. This phase of construction occurs after the structures have been erected, and fitted with stringing blocks (also called dollies or sheaves) and with single-leader p-line ropes that reach the ground. Stringing blocks are a type of pulley that attaches to the insulator assembly and temporarily support a pulling rope or p-line and a wire rope or hard line, which in turn supports the conductor before it is permanently clipped in.

The process starts as the crew pulls the p-lines toward the first structure beyond the setup area. The p-lines may be pulled down the ROW with a small wide-track bombardier or other small equipment, or strung by helicopter. After the p-line has been strung through all the structures for all phases within the stringing interval, the pulling ropes are attached to a hard line and pulled, one at a time, back through the dollies to the beginning of the interval. A hard line set-up is located at the opposite end of the interval from the wire stringing setup area. Each hard line is then attached to the conductor wire with an anti-rotation device and an attachment called a sock, which is pulled back through the dollies to the end of the interval. Crewmembers monitor the progress of stringing to ensure the sock does not get hung up in the dollies. One phase at a time, the conductor wire bundles are then pulled to the appropriate tension. Once all three phases have been tensioned, they are clipped into place utilizing permanent suspension hardware. If stringing and hard line set-up areas in wetlands are required when surface conditions are not stable, extensive use of timber matting may be required.

The most effective means to minimize impacts on water areas during construction is to span streams and rivers by placing structures above the normal high water level. Where waterways must be crossed by construction equipment, the Applicant would seek the appropriate permits and use temporary clear span bridges to minimize the impact on the waterway. For those waterways that cannot be crossed with construction equipment, workers might walk across or use boats during wire stringing operations to pull in the new conductors and shield wires or in the winter drive equipment across the ice. In areas where construction occurs close to waterways, appropriate measures will be employed to minimize soil erosion and prevent sedimentation of the waterways. The Applicant will ensure that equipment fueling and lubricating occurs at a reasonable distance from the waterways.

5.7.2 Substation

The site of the existing Blackberry 230/115 kV Substation near Grand Rapids will be expanded to incorporate the Project's substation facilities (Blackberry 500 kV Substation), located adjacent to and east of the existing substation (see Appendix A, sheet 54). The Project will also require a 500 kV Series Compensation Station, which will be located within or adjacent to the final route. Similar construction work will occur at the Blackberry 500 kV Substation site and at the site of the 500 kV Series Compensation Station.

The substation and series compensation facilities will be constructed in compliance with the applicable requirements of the NESC, Occupational Safety and Health Act, and state and local regulations. Designs will be completed by Minnesota-licensed professional engineers with relevant experience. Contractors will be committed to safe working practices. The final design of the substation facilities will take the local conditions of the substation site(s) into consideration, and where warranted, will include safety provisions beyond the minimum requirements established in the various applicable safety codes. The substation facilities will be designed to allow future maintenance to be done with the minimum impact on transmission system operation and the necessary clearance from energized equipment to ensure safety.

Standard construction and mitigation practices developed from experience with past projects as well as industry-specific best management practices (BMPs) will be employed. BMPs for the Project will be based on the specific construction design, prohibitions, maintenance guidelines, inspection procedures, and other activities involved in constructing the substation facilities. In some cases these activities, such as schedules, are modified to incorporate a BMP for construction that will assist in minimizing impacts on sensitive environments. For instance, in areas where construction occurs close to waterways, BMPs are employed to help prevent soil erosion and ensure that equipment fuel and lubricants do not enter the waterway.

Upon the completion of construction activities, the Applicant will restore the remainder of the site. Post-construction reclamation activities will include removing and disposing of debris, removing all temporary structures (including staging areas), and employing appropriate erosion control measures. If areas outside the substation site are disturbed by construction activities, they will be reseeded with vegetation similar to that which was removed, within certain height restrictions to prevent interference with the substation and the transmission lines entering the substation.

5.8 Maintenance and Operation

5.8.1 Transmission Line

Access to the ROW of a completed transmission line is required periodically to perform inspections, conduct maintenance, and repair damage. Regular maintenance and inspections will be performed during the life of the facility to ensure its continued integrity. Generally, 500 kV transmission lines are inspected annually for problems by foot, all terrain vehicle (ATV), truck, snowmobile, or by air. Inspections are limited to the ROW and to those areas where obstruction or terrain may require off-ROW access. If problems are found during inspection, the Applicant will make an effort to notify the landowner before repairs are performed. If damages are incurred during maintenance or repairs, the landowner will be compensated appropriately. The structures for the Project will be new, so very little maintenance is expected for many years.

The ROW is managed to remove vegetation that interferes with the operation of the Project. Vegetation maintenance for 500 kV transmission lines is typically on a 2- to 5-year cycle. ROW clearing practices include a combination of mechanical and hand clearing, along with herbicide application where allowed and approved by the landowner, to remove or control vegetation growth. Prior to performing vegetation maintenance in a particular area, the Applicant will make an effort to notify affected landowners.

5.8.2 Substation

Over the life of the substation facilities, inspections will be performed regularly to maintain equipment and make necessary repairs. Routine maintenance will be conducted as required to remove undesired vegetation that may interfere with the safe and reliable operation of the facilities.

5.9 Environmental Protection Measures

Limited ground disturbance may occur at the structure sites during construction. For example, the construction contractor generally establishes a main staging area for temporary storage of materials and equipment. Such an area includes sufficient space to lay down material and pre-assemble some structural components or hardware. Other staging areas located along the ROW are limited to a structure site for lay down and framing prior to structure installation. Stringing setup areas are used to store conductors and the equipment necessary for stringing operations. Disturbed areas are restored to their original condition to the maximum extent practicable, or as negotiated with the landowner.

Post-construction reclamation activities involve restoring disturbed areas to their original condition to the extent practical, including removing and disposing of debris; removing all temporary facilities, including staging and laydown areas; employing appropriate erosion control measures; and reseeding areas disturbed by construction activities with appropriate seed mixture certified as free of noxious or invasive weeds. In cases where soil compaction has occurred in cultivated areas, the construction crew or a restoration contractor uses various methods to alleviate the compaction, or as negotiated with landowners.

5.10 Estimated Costs

At the time that the Certificate of Need application for the Project was filed in October 2013, the final Route Alternatives and Segment Options for inclusion in this Route Permit application (Application) had not been determined. Therefore, at the time the Certificate of Need application was being compiled, the Applicant developed a proxy route that enabled its engineers to provide a meaningful cost estimate based on the best available information at that stage of the Project. Once the Route Alternatives and Segment Options were identified, the Applicant determined that it would be appropriate to refine the previously-provided cost estimates to reflect the more accurate route data that is currently available. In addition, the Applicant has refined its estimate related to expected construction costs, including the use of matting in wetlands to mitigate wetland impacts. The Applicant will continue to refine its estimates in both the Certificate of Need and Route Permit dockets as appropriate.

The cost estimates below are based on preliminary engineering considerations of the Route Alternatives and Segment Options. The Applicant estimates that the construction of the Project on the Route Alternatives and/or any combination of proposed Segment Options, including substation facilities, will cost between $495.5 million and $647.7 million (2013 dollars). If other routes are selected by the Commission, these current Project cost estimates may also change. The major components of these preliminary estimates are shown in Table 5-1, below.

Table 5-1. Current Project Cost Estimates

Project Components	Low End (in millions)	High End (in millions)
500 kV Transmission Line	$425.6	$570.8
Blackberry 500 kV Substation	$41.0	$45.1
500 kV Series Compensation Station	$24.7	$27.2
Existing 230 kV Transmission System Modifications	$4.2	$4.6
Project totals	$495.5	$647.7

5.11 Project Schedule

The Applicant requires an in-service date of June 1, 2020. The Applicant expects to complete the Route Permit approval process (including state and federal environmental review) by fall 2015. Depending on when other permits are received, it is estimated that Project construction will begin in fall 2016, as shown in Table 5-2, below.

Table 5-2. Project Schedule

Year	Month	Activity
2013	December	Certificate of Need Completeness Hearing
2014	February	Certificate of Need Environmental Report Scoping Meetings
	April	File Route Permit Application
	April	File Presidential Permit Application
	June	Route Permit/Presidential Permit Scoping Meetings
	June	Certificate of Need Environmental Report Released
	October	Certificate of Need Public Hearings
2015	February	Draft EIS Published
	March	Draft EIS Comment Meetings
	April	Certificate of Need Decision
	August	Final EIS Published
	August	State Final EIS Hearing
	October	Presidential Permit Decision
	October	Design, Right-of-way and Construction Permits Begin
	December	Route Permit Decision
2016	October	Construction Begins
2020	June	Project In Service