

Executive Summary

Minnesota Power, an operating division of ALLETE, Inc. (Applicant), is applying to the Minnesota Public Utilities Commission (PUC) for a Route Permit and to the U.S. Department of Energy (DOE) for a Presidential Permit to construct the Great Northern Transmission Line (GNTL).

ABOUT THE PROJECT

The project includes a 500 kilovolt (kV) alternating current (AC) transmission line between the Minnesota-Manitoba border (border crossing) and the existing Blackberry Substation near Grand Rapids, Minnesota, as well as associated substation facilities and transmission system modifications at the Blackberry Substation site, and a 500 kV series compensation station (Project) (see Figure ES-1 below).

Construction is expected to begin by 2016 and is expected to be completed by 2020.

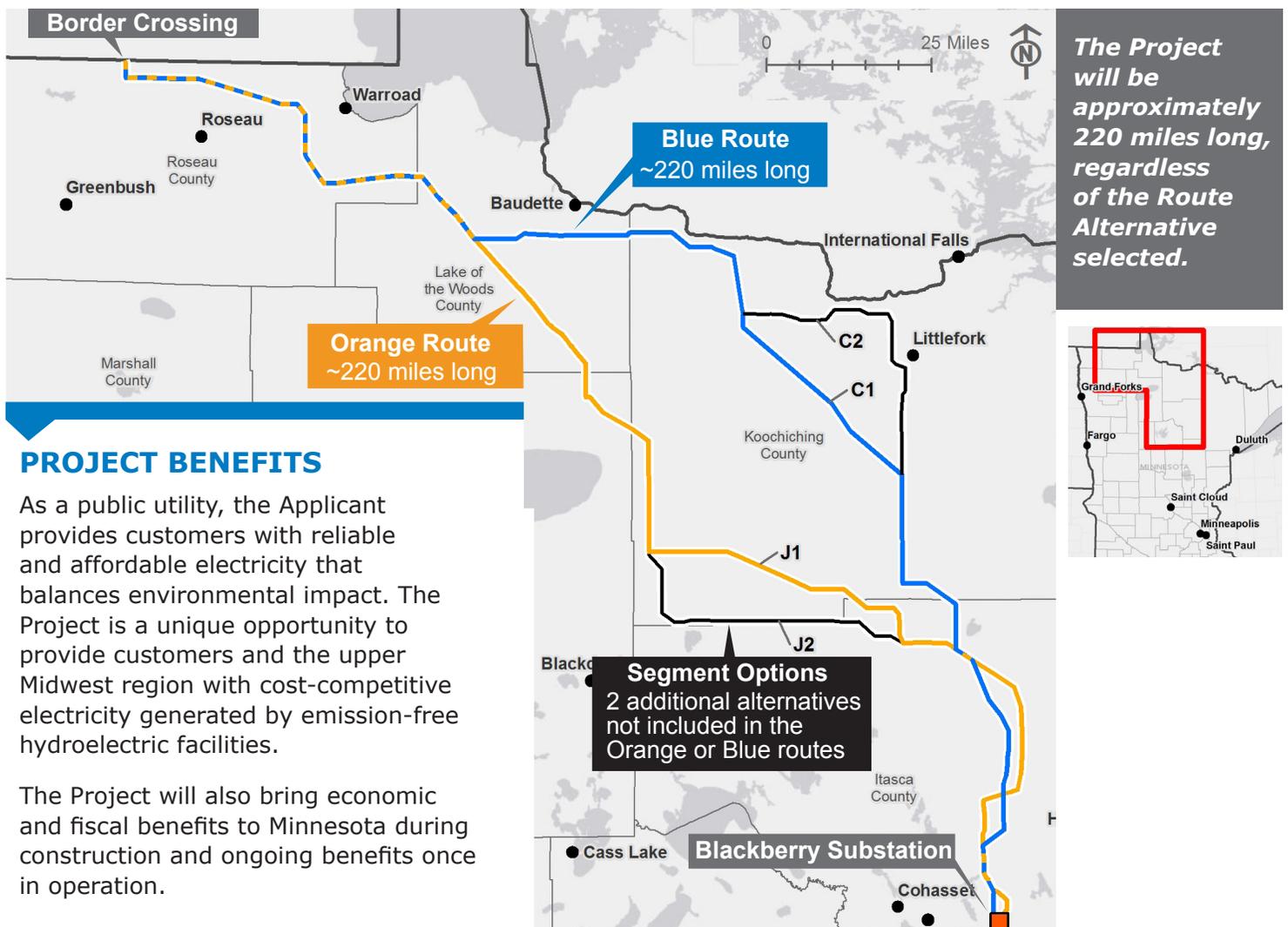
PROJECT PURPOSE AND NEED

The Project's purpose is to efficiently provide the Applicant's customers and the Midwest region with clean, emission-free energy that will:

- Help meet the region's growing energy demands
- Advance the Applicant's *EnergyForward* strategy to increase its generation diversity and renewable portfolio
- Strengthen system reliability
- Fulfill the Applicant's obligations under its power purchase agreements with Manitoba Hydro

all in a manner that is consistent with the Applicant's commitment to making a positive impact on communities.

FIGURE ES-1: PROPOSED ROUTE ALTERNATIVES



PROJECT BENEFITS

As a public utility, the Applicant provides customers with reliable and affordable electricity that balances environmental impact. The Project is a unique opportunity to provide customers and the upper Midwest region with cost-competitive electricity generated by emission-free hydroelectric facilities.

The Project will also bring economic and fiscal benefits to Minnesota during construction and ongoing benefits once in operation.

Executive Summary

PUBLIC PARTICIPATION AND AGENCY COORDINATION



From the outset of the Project development process, the Applicant recognized the importance of gathering data, input, and engaging members of the public, landowners, agencies, tribes, local government units, and non-government organizations (NGOs) in an upfront, comprehensive outreach program.

During the initial stages of Project development, the Applicant developed a strategic communication plan that identified stakeholders for the Project, along with communication tools, schedule, and approach to engage those stakeholders early and often throughout the route development process.

From August 2012 to November 2013, the Applicant organized more than 75 agency and public meetings and maintained an active online presence.

 **52** Public meetings **2,200+** People attended

 **13** Agency meetings **16** Agencies attended

 **1,780+** Comments received at meetings, online, or via the hotline

 **640+** Of comments received were mapped

REGULATORY FRAMEWORK

FEDERAL PROCESS



The Department of Energy is the lead federal agency for the Project. Pursuant to Executive Order (EO) 10485 of 1953, as amended by EO 12038, and 10 Code of Federal Regulations (CFR) Section 205.320, a

Presidential Permit is required for the Project because it will cross the international boundary between Minnesota and Manitoba, Canada.

Because the Project constitutes a Major Federal Action, DOE must consider the environmental effects of the Project, and reasonable alternatives to the Project, pursuant to the National Environmental Policy Act (NEPA). An Environmental Impact Statement (EIS) will be prepared in compliance with NEPA and DOE's NEPA implementing regulations, 10 CFR Part 1021.

STATE PROCESS



PUC regulates transmission line construction in Minnesota. PUC determines whether there is a need for a transmission line through its Certificate of Need process. PUC also determines the route—and any conditions it will require for the construction, operation, and maintenance of the transmission line—through its route permitting process.

The Applicant filed a Certificate of Need application for the Project with PUC October 22, 2013. The Certificate of Need application can be found on PUC's website, under MPUC Docket No. E015/CN-12-1163. The Certificate of Need establishes the size, type, and required end points of the Project.

This document is the Route Permit Application for authorization to construct a new transmission line and associated facilities in Minnesota.

PROJECT DESCRIPTION



TRANSMISSION LINE STRUCTURE TYPE

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 structure details provided in Figure ES-2 and Appendix D are typical of these structure types.

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.

Typical Spans: 1,000 feet - 1,450 feet

The Project structures typically will 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.

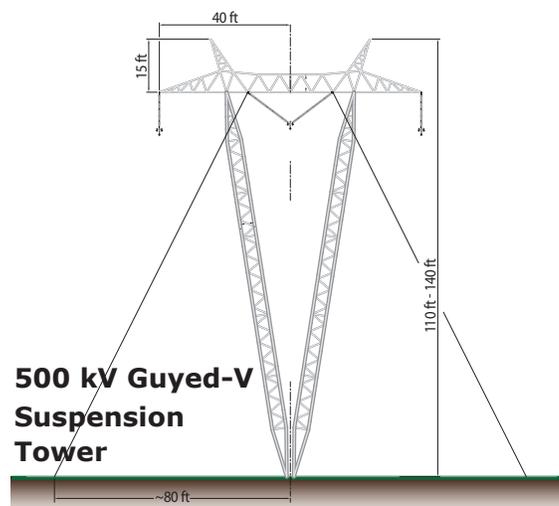
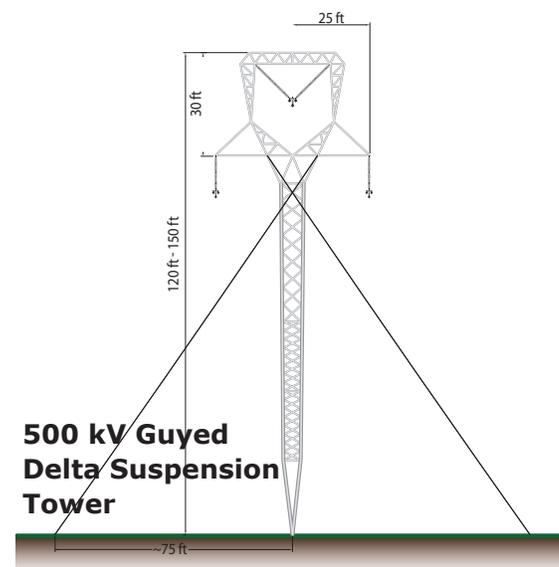
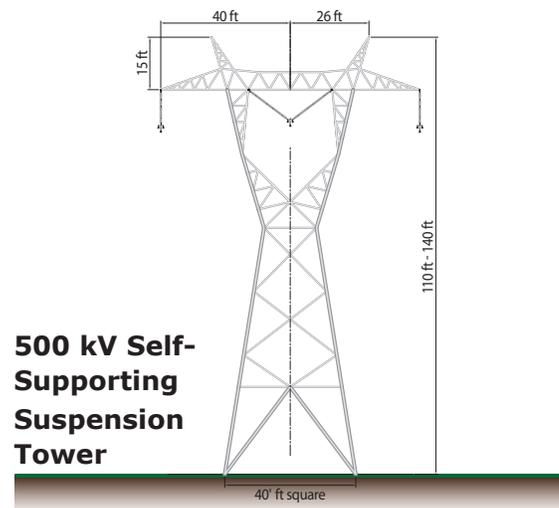
RIGHT-OF-WAY

This Project generally will require a new 200-foot-wide right-of-way (ROW) to accommodate the transmission line.

For high-voltage transmission lines, utilities acquire easement rights across certain parcels to accommodate the facilities. The evaluation and acquisition process includes title examination, initial owner contacts, survey work, document preparation, and easement purchase.

Right-of-way: 200 feet

FIGURE ES-2: STRUCTURE SCHEMATICS



PROPOSED ROUTE ALTERNATIVES

For purposes of reviewing potential environmental effects, the Applicant employed a Route Alternative that is 1,000 to 3,000 feet wide and a 200-foot wide anticipated ROW. The table below compares key conditions between the Orange and Blue Route Alternatives. The majority of the impacted land for either Route Alternative consists of woody wetlands and deciduous, evergreen, and mixed forest lands. Impacted agricultural land typically includes pasture and hay, row crops, and small grains.

KEY CONDITIONS EVALUATED	ORANGE ROUTE		BLUE ROUTE	
	220 miles long 30% parallel to existing transmission line ROW		219 miles long 38% parallel to existing transmission line ROW	
	Within 200 ft anticipated ROW	Within 1,000- 3,000 ft	Within 200 ft anticipated ROW	Within 1,000- 3,000 ft
Residences	0	64	0	49
Private land	+	32%	+	36%
County land	+	18%	+	12%
State land	+	49%	+	52%
Federal land	+	1%	+	1%
Permanently impacted acreage	2115	N/A	2,327	N/A
Percentage NWI wetlands	63%	58%	69%	62%
Acres of filled wetlands estimated	+	0.56	+	0.60
Acres of permanently impacted agricultural land	+	4	+	4
Percentage of forested land	52%	55%	45%	55%

+ Included in the value for impacts within 1,000 - 3,000 feet.

ADDITIONAL SEGMENT OPTIONS

Two additional Segment Options—not included within the Orange Route or the Blue Route—have been identified as potential alternatives (see Figure ES-1). Potential environmental impacts of these additional Segment Options are described in each resource section (see Section 6.0).

SUBSTATION AND ASSOCIATED FACILITIES

The Project will terminate at a new substation (that is, Blackberry 500 kV Substation) located on the same site as the Applicant's existing Blackberry 230/115 kV substation. The Blackberry 500 kV Substation 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. The Project also will require a 500 kV Series Compensation Station, the location of which, has not yet been determined. For purposes of the impact analysis, it was assumed that the 500 kV Series Compensation Station would be located at the Blackberry Substation site.

POTENTIAL ENVIRONMENTAL IMPACTS

The potential environmental impacts of the Project are addressed in detail in Section 6 of this Application. Table ES-1 summarizes the range of impacts that will occur for each environmental issue reviewed in that Section.

Table ES-1. Summary of Potential Environmental Impacts

Orange Route Alternative	Blue Route Alternative
Geomorphic and Physiographic Environment	
<p>The Project will require minimal excavation or surface grading because transmission lines are constructed to conform to the local topography. Surficial deposits are generally greater than 50 feet thick and in some areas bedrock might be encountered at construction depths. The Project is not expected to have temporary or permanent impacts on the geomorphic or physiographic environment.</p>	<p>Same as Orange Route.</p>
Soils	
<p>Surface soils will be disturbed by site clearing, grading, and excavation activities at structure locations, pulling and tensioning sites, setup areas, and during the transport of crews, machinery, materials, and equipment over access routes (primarily along rights-of-way [ROWS]).</p> <p>During dry conditions, this disturbance will be minimal, and generally will be less invasive than typical agricultural practices such as plowing and tilling.</p> <p>Soil compaction may occur on access paths, and at other locations, which is the result of heavy equipment activity. Soil erosion may occur if surface vegetation is removed, especially on fine textured soils that occur on sloping topography.</p>	<p>Same as Orange Route</p>
Climate	
<p>The Project will deliver hydropower and help diversify the energy fuel supply; it is a key component in the Applicant's long-term strategy to generate or purchase low-carbon energy resources and reduce GHG emissions. Through the Project and other planned projects, the Applicant plans to significantly reduce coal-generation in its portfolio. Other Manitoba Hydro customers will see similar GHG emission reductions. The Project therefore is not expected to have any long-term direct or indirect effects on climate.</p>	<p>Same as Orange Route.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Vegetation	
<p>Permanent conversion of forests (2,745 acres) and shrublands to more open, herbaceous settings within the anticipated ROW.</p> <p>Open, herbaceous landcover types will remain intact following construction, except at structures.</p> <p>Greenfield alignment through 89.6 miles of forest with associated reduction in intact blocks of forest habitat (that is, fragmentation).</p> <p>Approximately 25 acres of ecologically important lowland forests, as designated by Minnesota DNR would be crossed.</p> <p>Temporary impacts on all vegetation types during construction due to clearing for equipment access along access paths and at structure locations.</p> <p>Soil compaction due to the need for access to structures.</p> <p>Permanent loss of vegetation at structures.</p> <p>Potential for spread of invasive species and edge effects, particularly in adjacent forest communities.</p>	<p>Conversion of forests (2,680 acres) and shrublands to more open, herbaceous settings within the anticipated ROW.</p> <p>Open, herbaceous landcover types will remain intact following construction except, at structures.</p> <p>Greenfield through 82.8 miles of forest with associated reduction in intact blocks of forest habitat (that is, fragmentation).</p> <p>Approximately 42 acres of ecologically important lowland forests, as designated by Minnesota DNR would be crossed.</p> <p>Temporary impacts on all vegetation types during construction due to clearing for equipment access along access paths and at structure locations.</p> <p>Soil compaction due to the need for access to structures.</p> <p>Permanent loss of vegetation at structures.</p> <p>Potential for spread of invasive species and edge effects, particularly in adjacent forest communities.</p>
Human Settlement	
<p>No known residences are located within the anticipated ROW.</p> <p>Indirect effects on residential properties may occur and will include construction related noise, potential interruptions of traffic during construction, temporary impacts on land use, and possible changes to home or property values.</p>	<p>Same as Orange Route</p>
Land Use	
<p>The Project will obtain easement rights on the anticipated ROW, thus, the land will stay in current ownership. Permanent impacts to the use of the land would only occur at the structure locations, that is, the structures would permanently restrict the owner's use. Other areas within the anticipated ROW would have fewer restrictions on use, and, therefore, were not identified as a permanent impact.</p> <p>Additional personal income will be generated for residents in the region and the state by circulation and recirculation of dollars paid out by the Applicant as business expenditures and state and local taxes.</p>	<p>The Project will obtain easement rights on the anticipated ROW, thus, the land will stay in current ownership. Permanent impacts to the use of the land would only occur at the structure locations, that is, the structures would permanently restrict the owner's use. Other areas within the anticipated ROW would have fewer restrictions on use, and, therefore, were not identified as a permanent impact.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Land Use, <i>continued...</i>	
<p>Permanent impacts based on land ownership types will total approximately 4 acres for state conservation land; 11 acres for other privately owned land; 9 acres for county land; 25 acres for state forest; and approximately 3 acres for WMAs. All other land ownership types will have less than one acre of permanent impact.</p> <p>Permanent impacts on land cover types will total approximately 4,118 acres.</p> <p>No effect on zoning.</p>	<p>Permanent impacts based on land ownership types will total approximately 5 acres for state conservation land; 12 acres for other privately owned land; 6 acres for county land; and 28 acres for state forest. All other land ownership types will have less than one acre of permanent impact.</p> <p>Permanent impacts on land cover types will total approximately 3,908 acres.</p> <p>No effect on zoning.</p>
Environmental Justice	
<p>The Project will not have a disproportionately high and adverse affect on minority populations, or have a high impact on any individual or population. Minority and low-income individuals may experience construction related impacts in the same manner as other individuals. These may include temporary construction impacts and operation and maintenance impacts.</p>	<p>Same as Orange Route.</p>
Socioeconomic Factors	
<p>More than 200 jobs are estimated to be directly created from construction of the Project and 73 jobs are estimated to be added in industries such as food service, healthcare, and building and professional services. It is not anticipated that the Project will create new, permanent jobs.</p> <p>If local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in surrounding counties will contribute to the total personal income of the region.</p> <p>Indirectly, the increased capability and reliability of the electric system to supply energy to commercial and industrial users might contribute to the economic growth of the region.</p>	<p>Same as Orange Route.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Cultural Values	
<p>Although survey data suggests that there is a general understanding of the need for the Project, residents may not see the value of power transmission lines if there is no direct benefit to them.</p> <p>If there is no direct benefit in better, more reliable energy to the communities, or if they sense it will inhibit their economic life in relation to tourism, agriculture, or decreasing land values, and inadequate compensation for use of their land, there could be adverse effects on the cultural values of pragmatism and quality of life.</p> <p>Game animal populations are not expected to be affected by the Project. The Project is not expected to have any negative impacts on hunting opportunities within the Route Alternative.</p> <p>The Project will allow local residents to continue their overall individual economic and social activities, and access to the natural environment and tourism is not expected to be permanently and negatively affected by the Project.</p> <p>The presence of new transmission lines will not hinder use of trails or forest areas for recreational purposes.</p> <p>Overall, the Project is not expected to have lasting direct effects on the values of individualism and community pride.</p> <p>No indirect effects on economic well-being, quality of life, and standard of living are anticipated.</p>	<p>Same as Orange Route</p>
Aesthetics	
<p>The visual profile of transmission structures and conductors may influence the perceived aesthetic quality of a view from a particular location.</p> <p>Where the Orange Route is adjacent to the Big Bog State Recreation Area in Beltrami County, visual impact because of structures and conductors could be long-term if they can be viewed from the boardwalk. Additional study is required to determine potential impacts at this location.</p> <p>There are 64 residences located within the Route Alternative, but no residences are located within the anticipated ROW. The presence of existing natural windbreaks and tree rows may reduce the visual impact of the Project to the residences.</p> <p>Additional visual intrusion will occur at the location where the transmission line crosses roads and trails.</p>	<p>The visual profile of transmission structures and conductors may influence the perceived aesthetic quality of a view from a particular location.</p> <p>There are 49 residences located within the Route Alternative, but no residences are located within the anticipated ROW. The presence of existing natural windbreaks and tree rows may reduce the visual impact of the Project to the residences.</p> <p>The primary visual intrusion will occur at the location where the transmission line crosses roads and trails.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Noise	
<p>Analysis results indicate that audible noise associated with the Project will be in compliance with the relevant MPCA noise standards at the edge of the Project ROW in most areas. Where the Project parallels the existing 500 kV line, the analysis results indicate that audible noise has the potential to reach 50.5 dBA on an L50 basis at the edge of the common ROW for the two lines. Based on a review of aerial photography using GIS technology, the nearest residence is approximately 2,000 feet away from the ROW. At that distance, the projected audible noise levels attributable to the Project are expected to attenuate such that they will not cause or contribute to an exceedence of the MPCA noise standards.</p> <p>Construction equipment, including heavy trucks and cranes, supporting equipment like air compressors and concrete mixers, and potentially even helicopters, would generate temporary noise in the area surrounding the construction site.</p>	<p>Same as Orange Route.</p>
Air Quality	
<p>No permanent or long-term effect on air quality.</p> <p>During construction of the Project, limited, temporary, and localized impacts on air quality might occur during construction of either Route Alternative due to the disturbance of topsoil, which raises fugitive dust particles.</p>	<p>Same as Orange Route.</p>
Public Services	
<p>Once construction is complete, the Project, including all Route Alternatives, will span all roads and therefore will not impede emergency services or otherwise result in any long-term, negative direct or indirect effects on public services.</p> <p>Gas pipelines are not common in the Study Area, therefore, impacts on gas and oil pipelines are not expected.</p> <p>The Orange Route Alternative parallels existing electrical transmission lines for approximately 66.4 miles. Construction and operation of the Project will not interfere with the operation of existing transmission lines as the appropriate separation distance will be maintained for clearance and safety issues.</p>	<p>Once construction is complete, the Project, including all Route Alternatives, will span all roads and therefore will not impede emergency services or otherwise result in any long-term, negative direct or indirect effects on public services.</p> <p>Gas pipelines are not common in the Study Area, therefore, impacts on gas and oil pipelines are not expected.</p> <p>The Blue Route Alternative parallels existing electrical transmission lines for approximately 84.2 miles. Construction and operation of the Project will not interfere with the operation of existing transmission lines as the appropriate separation distance will be maintained for clearance and safety issues.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Radio, TV, Cellular Telephone	
<p>The Applicant does not expect that radio or television interference will be an issue within the Study Area.</p> <p>There are no communication towers located in the anticipated ROW thus, construction of the Project will not directly affect any communication towers.</p> <p>No indirect impacts on omnidirectional communications are anticipated as the transmission line hardware will be designed to reduce gap discharges and corona discharges. The transmission line will be properly maintained to minimize gap discharges and corona discharges.</p>	Same as Orange Route.
Electric and Magnetic Fields	
No direct or indirect effects attributed to electric and magnetic fields from the Project are expected.	Same as Orange Route.
Archeological and Historical Resources	
<p>Information was obtained from existing public records recorded at the State Historic Preservation Office to evaluate potential impacts to archaeological and historic resources. A full field evaluation has not been completed.</p> <p>Two architectural properties are known to be present with the anticipated ROW that could be directly or indirectly affected. The anticipated ROW does not include any properties previously listed or determined eligible for the National Register of Historic Places.</p> <p>Possible impacts on archaeological and architectural properties, and Traditional Cultural Properties (TCPs) could result from one or more of the following:</p> <ul style="list-style-type: none"> → Direct disturbance or alteration to the resource from preconstruction, construction, or maintenance activities. → Disturbance to surface soils from heavy construction vehicles, equipment, or materials. → Disturbance to surface soils through grubbing, stump removal, boulder removal, and grading. → Subsurface excavation necessary for construction. 	Same as Orange Route.

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Archeological and Historical Resource, <i>continued...</i>	
<ul style="list-style-type: none"> → Visual, atmospheric, or audible intrusions causing alterations to the setting, character, viewshed, or landscape of the property. → Unauthorized removal of or damage to the property by individuals made aware of the presence of such properties. 	
Water Resources and Floodplains	
<p>This section evaluated potential impacts to public water inventory (PWI) watercourses and basins, as well as floodplains. Crossings that were greater than 1,000 feet-wide may result in placement of at least one structure in the basin or floodplain.</p> <p>Direct impacts on surface water resources likely will occur at the unnamed PWI basin in Roseau County. The span width of the unnamed PWI basin in Roseau County is approximately 2,118 feet wide, which may require one or more structures to be placed within this basin. Direct impacts on other PWI basins or watercourses are not likely to occur since they are spannable.</p> <p>Indirect effects on PWI resources will include the removal of riparian or shoreline forests where present. In addition to the habitat changes this will cause, it could increase light penetration to the waterbody. These indirect effects have potential to cause increased water temperature and changes to aquatic plant community.</p> <p>Temporary access across PWI watercourses (see Table 6.17-2) may be required to facilitate construction of portions of this Route Alternative, especially where located in isolated areas and where access to the ROW from public roads will be limited.</p> <p>The Orange Route will cross four impaired waterways. Direct impacts on surface water resources are not likely to occur to Minnesota Pollution Control Agency (MPCA) impaired watercourses during construction of the Project, because the impaired water features will be avoided by spanning the transmission line over the watercourses.</p>	<p>This section evaluated potential impacts to public water inventory (PWI) watercourses and basins, as well as floodplains. Crossings that were greater than 1,000 feet-wide may result in placement of at least one structure in the basin or floodplain.</p> <p>Direct impacts on surface water resources likely will occur at the unnamed PWI basin in Roseau County and at Grass Lake in Itasca County. The span width of the unnamed PWI basing in Roseau County wetland is approximately 2,118 feet wide, which may require one or more structures to be placed within this basin. The span width of Grass Lake in Itasca County will be approximately 1220 feet, which may require one or more structures to be placed within this basin.</p> <p>Indirect effects on PWI resources will include the removal of riparian or shoreline forests where present. In addition to the habitat changes this will cause, it could increase light penetration to the waterbody. The Blue Route crosses Pitt Grade Creek in Lake of the Woods County, where this may be an issue. These indirect effects have potential to cause increased water temperature and changes to aquatic plant community.</p> <p>Temporary access across PWI watercourses (see Table 6.17-2) may be required to facilitate construction of portions of this Route Alternative, especially where located in isolated areas and where access to the ROW from public roads will be limited.</p> <p>The Blue Route will cross three impaired waterways. Direct impacts on surface water resources are not likely to occur to MPCA impaired watercourses during construction of the Project, because the impaired water features will be avoided by spanning the transmission line over the watercourses.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Water Resources and Floodplains, <i>continued...</i>	
<p>Indirect impacts that might affect turbidity and dissolved oxygen are from sediment runoff from stormwater during construction, due to the presence of exposed topsoil or disturbed vegetation within the ROW.</p> <p>The Orange Route will cross floodplains associated with the Roseau River/Sprague Creek, Winter Road River, Troy Creek, Rapid River (Main & North Branch), Chase Brook, Wade Brook, Tamarack River and the Prairie River. In total, approximately 79,706 feet (15.1 miles, approx.) of the Orange Route is located in floodplains. Where complete avoidance of floodplains is not feasible, structure placement will have little to no effects on water flow, flood water storage capacity, or flooding in those floodplains because the volume displaced by the structures will be so small as to be negligible.</p> <p>Permanent impacts on groundwater resources are not anticipated to occur as a result of this Project. Temporary impacts during construction could occur if dewatering is necessary to install the transmission structures.</p> <p>The Project will not be expected to result in violations of groundwater quality standards. xx</p> <p>Approximately 1.0 mile of the Orange Route crosses the Hay Creek Impoundment Area, located within the Roseau River Watershed. The impacts on water flow, flood water storage, and flooding will be negligible due to the small volume of structures compared to the approximately 9,500-acre-feet capacity of the impoundment.</p> <p>Permanent impacts on groundwater resources are not anticipated to occur as a result of this Project. Temporary impacts during construction could occur if dewatering is necessary to install the transmission structures.</p> <p>The Project will not be expected to result in violations of groundwater quality standards.</p>	<p>Indirect impacts that might affect turbidity and dissolved oxygen are from sediment runoff from stormwater during construction, due to the presence of exposed topsoil or disturbed vegetation within the ROW.</p> <p>The Blue Route will cross floodplains associated with the Roseau River/Sprague Creek, Winter Road River, Peppermint Creek, Baudette River West Fork, Rapid River, Rapid River East Fork, Black River, Big Fork River, and Reilly Brook. In total, approximately 73,622 feet (13.9 miles, approx.) of the Blue Route are located in floodplains. Where complete avoidance of floodplains is not feasible, structure placement will have little to no effects on water flow, flood water storage capacity, or flooding in those floodplains because the volume displaced by the structures will be so small as to be negligible.</p> <p>Approximately 1.0 mile of the Blue Route crosses the Hay Creek Impoundment Area, located within the Roseau River Watershed. The impacts on water flow, flood water storage, and flooding will be negligible due to the small volume of structures compared to the approximately 9,500-acre-feet capacity of the impoundment.</p> <p>Permanent impacts on groundwater resources are not anticipated to occur as a result of this Project. Temporary impacts during construction could occur if dewatering is necessary to install the transmission structures.</p> <p>The Project will not be expected to result in violations of groundwater quality standards.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Wetlands	
<p>Direct permanent wetland impacts will occur where dredging or filling is required for structure foundation installation. The estimate of the total amount of wetlands that will need to be filled to install structures within the anticipated ROW, assuming a 1,000 foot span length is approximately 0.56 acres. The Applicant estimates that a total of approximately 5.3 acres of wetland will be filled for the construction of the Blackberry 500 kV Substation and the 500 kV Series Compensation Station.</p> <p>Conversion of forested wetlands is likely the greatest permanent impact on wetlands associated with the Project. Removal of trees within the ROW is required to ensure the safe and efficient operation of the transmission line. Removal of woody vegetation within a forested wetland area will not require dredging or filling, nor will it reduce overall wetland acreage, but will convert the forested wetland area to a different vegetative class and thus a different wetland type.</p> <p>The Orange Route will convert 1,667 acres of forested wetland.</p> <p>Permanent conversion of 448 acres of shrub wetlands will occur within a minimum 70-foot-wide swath beneath the transmission line conductors, additional clearing width as well as the removal of tall growing species may be necessary.</p> <p>Temporary wetland impacts due to construction activities will occur to wetland areas that are not permanently impacted or permanently converted to another wetland type. Temporary impacts are expected to occur in emergent (that is, palustrine emergent [PEM] type) wetlands during construction. The Orange Route would cross 117 miles of muck soils, which can be more sensitive to construction impacts.</p> <p>The Project has potential to impact wetlands through soil erosion and sediment deposition due to construction activities. Sedimentation in wetlands can cause changes to vegetation, with greater potential for establishment of invasive species, such as reed canary grass.</p>	<p>Direct permanent wetland impacts will occur where dredging or filling is required for structure foundation installation. The estimate of the total amount of wetlands that will need to be filled to install structures within a anticipated ROW, assuming a 1,000 foot span length is approximately 0.60 acres. The Applicant estimates that a total of approximately 5.3 acres of wetland will be filled for the construction of the Blackberry 500 kV Substation and the 500 kV Series Compensation Station.</p> <p>Conversion of forested wetlands is likely the greatest permanent impact on wetlands associated with the Project. Removal of trees within the ROW is required to ensure the safe and efficient operation of the transmission line. Removal of woody vegetation within a forested wetland area will not require dredging or filling, nor will it reduce overall wetland acreage, but will convert the forested wetland area to a different vegetative class and thus a different wetland type.</p> <p>The Blue Route will convert 1,908 acres of forested wetland.</p> <p>Permanent conversion of 419 acres of shrub wetlands will occur within a minimum 70-foot-wide swath beneath the transmission line conductors, additional clearing width as well as the removal of tall growing species may be necessary.</p> <p>Temporary wetland impacts due to construction activities will occur to wetland areas that are not permanently impacted or permanently converted to another wetland type. Temporary impacts are expected to occur in emergent (that is, PEM Type) wetlands during construction. The Blue Route would cross 127 miles of muck soils, which can be more sensitive to construction impacts.</p> <p>The Project has potential to impact wetlands through soil erosion and sediment deposition due to construction activities. Sedimentation in wetlands can cause changes to vegetation, with greater potential for establishment of invasive species, such as reed canary grass.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Wildlife	
<p>Wildlife management areas (WMAs) are managed to provide habitat for wildlife as well as hunting opportunities. The Orange Route includes 342 acres of WMA within the anticipated ROW.</p> <p>Habitat fragmentation reduces the size of contiguous blocks of forest, shrubland, wetland, prairie, and grassland. This reduces the total area of contiguous habitat available to wildlife species and increases the isolation of the habitat. In forested habitat, it leads to an increase in edge habitat that is successfully exploited by a variety of predatory and scavenging species. The Orange Route includes 89.6 miles of forest greenfield impact.</p> <p>Potential impacts on wildlife from the Project include the direct or indirect loss or conversion of habitat, increased habitat fragmentation, and the potential risk of avian collisions with transmission conductors and equipment.</p> <p>Temporary impacts may include displacement due to construction activities or compaction of grassland habitat along access roads.</p>	<p>Wildlife management areas (WMAs) are managed to provide habitat for wildlife as well as hunting opportunities. The Blue Route includes 114 acres of WMA within the anticipated ROW.</p> <p>Habitat fragmentation reduces the size of contiguous blocks of forest, shrubland, wetland, prairie, and grassland. This reduces the total area of contiguous habitat available to wildlife species and increases the isolation of the habitat. In forested habitat, it leads to an increase in edge habitat that is successfully exploited by a variety of predatory and scavenging species. The Blue Route includes 82.8 miles of forest greenfield impact.</p> <p>Potential impacts on wildlife from the Project include the direct or indirect loss or conversion of habitat, increased habitat fragmentation, and the potential risk of avian collisions with transmission conductors and equipment.</p> <p>Temporary impacts may include displacement due to construction activities or compaction of grassland habitat along access roads.</p>
Rare and Unique Species and Communities	
<p>There are 24 species listed as threatened, endangered, special concern, or unique resources that could occur in or near the Orange Route. Species protected by state statutes that occur within 1 mile of the Orange Route include 15 plants, 6 birds, 2 mollusks, 1 insect, and 3 terrestrial communities. One vascular plant is listed by Minnesota as endangered. Eight species are listed as state threatened. The remaining resources are listed as of special concern or unique resources.</p> <p>Potential impacts on rare and unique species from the Project include the direct or indirect loss or conversion of habitats and increased habitat fragmentation.</p> <p>Increased disturbance associated with clearing and construction related equipment that may allow invasive species to colonize previously undisturbed plant communities or increased disturbance in areas adjacent to existing transmission lines.</p>	<p>There are 14 species listed as threatened, endangered, special concern, or unique resources that have occurred in or near the Blue Route. Species protected by state statutes that occur within 1 mile of the Blue Route include 7 plants, 5 birds, 2 mollusks, 2 colonial waterbird sites, and 3 terrestrial communities. In general, the western side of the Blue Route Alternative, because of the dominance of tilled agriculture, contains less native habitat, and thus fewer protected species, than other parts of the route.</p> <p>Potential impacts on rare and unique species from the Project include the direct or indirect loss or conversion of habitats and increased habitat fragmentation.</p> <p>Increased disturbance associated with clearing and construction related equipment that may allow invasive species to colonize previously undisturbed plant communities or increased disturbance in areas adjacent to existing transmission lines.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Rare and Unique Species and Communities, <i>continued...</i>	
<p>The Orange Route crosses Watershed Protection Areas (WPAs) for calcareous fens at the Pine Creek Peatland SNA, Sprague Creek Peatland SNA, Red Lake Peatland SNA, and Lost River Peatland SNA fen complexes. A determination of potential effects on known fen complexes will require coordination with Minnesota DNR.</p>	<p>The Blue Alternative crosses WPAs for the Sprague Creek Peatland SNA and Pine Creek Peatland SNA, which contain calcareous fens. The WPA for the North Black River Peatland SNA and the Myrtle Lake Peatland SNA also are crossed by the Blue Route. A determination of potential effects on known fen complexes will require coordination with Minnesota DNR.</p>
Noxious Weeds and Exotic Organisms	
<p>Construction of the Route Alternative could lead to the introduction or spread of noxious weeds or other invasive species in an area due to ground disturbance, leaving exposed soils for extended periods, introduction of contaminated topsoil, vehicles importing weed seed from a contaminated site to an uncontaminated site and through conversion of landscape type, particularly from forested to open settings.</p>	<p>Construction of the Route Alternative could lead to the introduction or spread of noxious weeds or other invasive species in an area due to ground disturbance, leaving exposed soils for extended periods, introduction of contaminated topsoil, vehicles importing weed seed from a contaminated site to an uncontaminated site and through conversion of landscape type, particularly from forested to open settings</p>
Recreation and Tourism	
<p>Potential impacts on recreation and tourism resources might include changes to or loss of scenic resources, hunting opportunities and other wildlife recreational opportunities; impacts on water and forest resources used for recreation; temporary increase in noise levels; and increased off-highway vehicle (OHV) use following development of a new ROW.</p> <p>Where the Orange Route is adjacent to the Big Bog State Recreation Area in Beltrami County, visual impact because of structures and conductors could be long-term if they can be viewed from the boardwalk. Additional study is required to determine potential impacts at this location.</p>	<p>Potential impacts on recreation and tourism resources might include changes to or loss of scenic resources, hunting opportunities and other wildlife recreational opportunities; impacts on water and forest resources used for recreation; temporary increase in noise levels; and increased OHV use following development of a new ROW.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Agricultural Production	
<p>Permanent impacts on agricultural lands total approximately 4 acres.</p> <p>Temporary impacts on agricultural lands total approximately 79 acres.</p> <p>Loss of prime farmland will occur (that is, 16 acres permanently; 324 acres temporarily).</p>	<p>Permanent impacts on agricultural lands total approximately 4 acres.</p> <p>Temporary impacts on agricultural lands total approximately 90 acres.</p> <p>Loss of prime farmland will occur (that is, 14 acres permanently; 289 acres temporarily).</p>
Transportation	
<p>Temporary road closures, lane closures, and traffic detours during construction and maintenance resulting in increased traffic times.</p> <p>Temporary railway closures or delays due to construction of Project structures at rail crossings.</p> <p>The Route Alternatives have been located outside of the identified flight zones, but confirmation of impact avoidance with airport officials will be required.</p>	<p>Same as Orange Route.</p>
Forestry	
<p>Construction of the transmission line will convert 2,745 acres of forest land within the anticipated ROW to shrub and grasslands. Of this forest, 470 acres are under corporate/industrial ownership.</p> <p>The long-term impact of taking acreage out of forest production will be minimal because of the Project acreage is small in comparison to the regional timber resources.</p> <p>Additional impacts on forestlands are likely for the Blackberry 500 kV Substation and possibly the 500 kV Series Compensation Station. Based on the assumptions used for impact analysis, approximately 5 acres of forest will be affected for construction of the Blackberry 500 kV Substation and the 500 kV Series Compensation Station. Temporary impacts for construction of access roads and creation of storage and lay-down areas will be calculated following determination of the final Route Alternative.</p>	<p>Construction of the transmission line will convert 2,680 acres of forest land within the anticipated ROW to shrub and grasslands. Of this forest, 719 acres are under corporate/industrial ownership.</p> <p>The long-term impact of taking acreage out of forest production will be minimal because of the Project acreage is small in comparison to the regional timber resources.</p> <p>Additional impacts on forestlands are likely for the Blackberry 500 kV Substation and possibly 500 kV Series Compensation Station. Based on the assumptions used for impact analysis, approximately 5 acres of forest will be affected for construction of the Blackberry 500 kV Substation and the 500 kV Series Compensation Station. Temporary impacts for construction of access roads and creation of storage and lay-down areas will be calculated following determination of the final Route Alternative.</p>

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Table ES-1. Summary of Potential Environmental Impacts, *continued...*

Orange Route Alternative	Blue Route Alternative
Mining	
<p>The construction of a transmission structure within an aggregate resource, potential quarry, or mining area can reduce the development potential of these resources by limiting access to the underground mining resource and limiting use of heavy mining equipment and explosives (that is, blasting) near transmission lines.</p> <p>One gravel pit is located within the anticipated ROW of the Orange Route. There should be sufficient room to route the final ROW to avoid the gravel pit shown in the 2013 aerial photographs. No direct impacts on aggregate mining resources are expected to occur due to construction and operation of the Project.</p> <p>Both Route Alternatives intersect active state non-ferrous metallic mineral leases. There are currently no active non-ferrous metallic mines on the leased land, although the potential exists for additional exploration and future mining in the Study Area. The Project has the potential to directly affect future development of metallic mineral resources.</p>	<p>The construction of a transmission structure within an aggregate resource, potential quarry, or mining area can reduce the development potential of these resources by limiting access to the underground mining resource and limiting use of heavy mining equipment and explosives (that is, blasting) near transmission lines. No aggregate resource, quarries or mines were identified within the anticipated ROW of the Blue Route. No direct impacts on aggregate mining resources are expected to occur due to construction and operation of the Project.</p> <p>Both Route Alternatives intersect active state non-ferrous metallic mineral leases. There are currently no active non-ferrous metallic mines on the leased land, although the potential exists for additional exploration and future mining in the Study Area. The Project has the potential to directly affect future development of metallic mineral resources.</p>

PROPOSED MITIGATION

The Route Permit, Presidential Permit, and other federal and state permits will require the implementation of mitigation measures to prevent or minimize impacts on resources from the construction and operation of the Project. The Applicant has voluntarily proposed the mitigation measures for each resource area summarized in Table ES-2 below. Mitigation is not required or proposed for the following resource areas:

- Geomorphic and physiographic environment
- Climate
- Environmental justice
- Socioeconomic factors
- Noise
- Electric and magnetic fields

Table ES-2. Proposed Mitigation Measures

Resource	Mitigation Measures
All Resource Types	<p>The Applicant will retain an environmental inspector (EI) during Project construction. Working on behalf of the Applicant, the EI will be responsible for understanding all of the conditions of the Project's environmental permits and to ensure that the contractors abide by these conditions.</p>
Soils	<p>To the extent practical, soil disturbance and excavation activities in steep slope areas will be avoided.</p> <p>Where disturbance and excavation cannot be avoided entirely, it will be minimized using best management practices (BMPs) such as matting, ice roads, and low ground pressure equipment to the extent practical to minimize impacts during construction.</p> <p>Sediment and erosion control plans will be developed that specify the types of BMPs necessary. Depending on the site, BMPs may include installation of silt fence, straw bales, or ditch blocks, and/or covering bare soils with mulch, plastic sheeting, or fiber rolls to protect drainage ways and streams from sediment runoff.</p> <p>Erosion control practices will be inspected during construction, especially during significant precipitation events.</p> <p>Soil compaction in cultivated areas will be treated and restored through tillage operations, for example using a subsoiler.</p> <p>Where rutting occurs, the Applicant will repair the surface and restore ground vegetation upon completion of work in a given area.</p> <p>All disturbed areas will be revegetated once construction is complete. Seed mixes will be specified based on site characteristics and in accordance with regulatory permits.</p> <p>The introduction and establishment of noxious weeds will be minimized by prompt re-vegetation of disturbed areas using regional genotype native species where appropriate or by seed based on landowner agreements.</p>
Vegetation	<p>All areas of ground disturbance not permanently altered will be prepared for restoration (that is, soil preparation), and reseeded with an appropriate seed mix recommended by the appropriate agency's management or according to landowner requirements (subject to other regulations and permit conditions, such as, control of noxious weeds [see Section 8.21, Noxious Weeds and Exotic Organisms]), Section 401 and Section 404 of the Clean Water Act wetlands and waters permits, or National Pollutant Discharge Elimination System (NPDES) permit required prior to construction.</p> <p>The Applicant will continue to coordinate with Minnesota DNR to minimize and avoid impacts on plant communities on state lands through adjustments to the anticipated ROW, permit conditions, and mitigation.</p> <p>Where forested areas are cleared, appropriate herbaceous native seed mixes from sources as close as possible to the Study Area will be used to re-vegetate, as rapidly as possible, to prevent encroachment by non-native and noxious weed species. Where possible, reliance on natural revegetation will be encouraged (particularly in wetland areas).</p>

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Table ES-1. Proposed Mitigation Measures, continued...

Resource	Mitigation Measures
Vegetation, <i>continued...</i>	<p>Project construction will occur in wetlands and wet soils during frozen conditions to the extent practical to minimize soil compaction. Construction mats will be used to help protect wet soils where encountered during construction. Wetland protection and mitigation is discussed in Section 6.18, Wetlands.</p> <p>Where only portions of the HCVFs are located within the Route Alternatives, it may be possible to avoid entirely the designated HCVF by shifting the ROW within the Route Alternatives.</p>
Human Settlement	<p>Property or easement acquisition will be conducted in accordance with applicable state and federal regulations.</p> <p>During ROW acquisition, the placement of individual structures may be coordinated with property owners, to the extent practicable.</p> <p>The construction crews will follow local, state, and federal regulations with regard to construction noise, dust, and timing.</p> <p>The Project will be designed with local, state, and National Electrical Safety Code (NESC) standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, and ROW widths. Construction crews will comply with local, state, and NESC standards regarding installation of facilities and standard construction practices. Established Applicant and industry safety procedures will be followed during and after construction of the Project, including clear signage during all construction activities.</p> <p>The transmission line will be equipped with protective devices to safeguard the public if an accident occurs, such as a structure or conductor falling to the ground. The protective devices are circuit breakers and relays located where the transmission line connects to the substation. The protective equipment is designed to de-energize the transmission line should such an event occur.</p> <p>The substation facilities will have appropriate signage, will be fenced, and access will be limited to authorized personnel.</p>
Land Use	<p>The Applicant will work with Minnesota DNR to minimize impacts on sensitive forested areas within the state forests. Areas disturbed in state forest land would be reseeded with a seed mix recommended by the appropriate agency's management.</p> <p>The minimum area necessary will be used for access roads.</p> <p>Spans will be adjusted such that structures, where practicable, will avoid open water and transportation corridors. Likewise, construction and maintenance access roads will be located to avoid or minimize impacts on these areas as well.</p> <p>Construction activities will be limited to the ROW, unless access permission is obtained from landowners.</p> <p>Fences, gates, and similar improvements that are removed or damaged would be repaired or replaced.</p> <p>Mitigation of potential impacts at the Blackberry 500 kV Substation will focus on selecting the appropriate location for constructing the required facilities within the site.</p>

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Table ES-1. Proposed Mitigation Measures, continued...

Resource	Mitigation Measures
Cultural Values	<p>The proposed Project will include vegetative restoration using native species, to the extent practicable. Water quality impacts that may affect wild rice are not anticipated and will be minimized through the installation and maintenance of BMPs. Construction activities and timing will be announced through the Project website in an effort to minimize conflicts with local recreational activities. The Applicant expects to address issues as they might arise, using agreed-upon methods as outlined in a Programmatic Agreement document as well as through the State and National Environmental Protection Act (NEPA) scoping process.</p>
Aesthetics	<p>The Applicant will seek to minimize the negative visible impacts of the Project at site specific locations, such as travel ways, recreation sites, and bodies of water with access and residences. Minor shifts to the anticipated ROW will be evaluated once a Route Alternative is chosen, to further minimize impacts.</p> <p>Further evaluate potential visual impacts at the Big Bog State Recreation Area and work with Minnesota DNR to identify mitigation, as appropriate.</p> <p>Residences have been avoided and distances to residences and structures were maximized during the development of the Route Alternatives and Segment Options to the extent practical.</p> <p>The Project will parallel existing ROWs, to the extent practical, to minimize visual impacts on farmlands, open spaces, and recreational areas.</p> <p>Crossing of Water of the Dancing Sky (that is, Minnesota Highway 11) will be perpendicular to that highway and will be parallel to the existing 500 kV transmission line.</p> <p>To the greatest extent possible, waterways will be spanned in the same location as existing disturbances or ROWs; otherwise, the Applicant will seek to cross waterways perpendicularly to the extent practical to minimize visual effects of recreational users.</p> <p>In most cases, the ROW will need to remain free of trees throughout construction and operation of the Project; however, bushy shrubs and low-growing vegetation could be allowed to regenerate in portions of the ROW to reduce, though not eliminate, the visual impacts. Planting of visual screening will be considered on a case-by-case basis.</p> <p>The Applicant and its contractors will remove construction waste and scrap on a regular schedule or at the end of each construction phase to minimize short-term visual impacts.</p>
Air Quality	<p>Regular, frequent cleaning of construction equipment and vehicles on the ROW will occur.</p> <p>Restoration of cleared ROWs, storage areas, and access roads will minimize the extent of disturbed areas and limit the potential for dust generation.</p> <p>All disturbed areas will be revegetated once construction is complete.</p>

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Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Public Services & Utility Systems	<p>As construction progresses, information will be provided to local emergency services to inform personnel of upcoming activity and impacts of the work as well as to plan for emergency situations on the construction site, should they occur.</p> <p>The Applicant will coordinate and provide the necessary requirements for any short term road or lane closure with the appropriate authority, including emergency services.</p> <p>Prior to construction, the Gopher State One-Call utility locating service will be utilized to identify buried utilities that must be avoided during construction, including pipelines and any associated distribution lines.</p> <p>The Applicant will also coordinate the appropriate construction measures to protect buried pipelines or electric lines where they must be crossed by heavy equipment.</p> <p>If any disruptions to the electrical system are required during construction, the Applicant or the contractor will contact the appropriate utility or electric cooperative to schedule planned disruptions.</p> <p>The Applicant will address potential simultaneous outages of the Project and the existing 500 kV line due to weather events by developing a weather study of the Project's Study Area to define and incorporate the appropriate design considerations based on actual weather data. Based on the weather study, the design criteria for the Project may be adjusted to increase the robustness of the design for those lengths where the Project parallels the existing 500 kV transmission line.</p> <p>Where design criteria cannot fully address potential simultaneous outages due to weather events, as is the case with tornadoes, the Applicant will consider further mitigation as appropriate to enhance restorability. This could include more frequent use of anti-cascade towers, maintaining an increased supply of emergency spare towers, or even locating a permanent storage facility for emergency spares on or near the location where the Project parallels the existing 500 kV transmission line.</p> <p>The Applicant will address potential simultaneous outages of the Project and the existing 500 kV line due to lightning events by installing shield wires and single pole tripping, a protective relay scheme that allows power to continue being transferred over the line even if one of the three phases is struck by lightning. Since the majority of lightning events only affect one phase of a transmission line, single pole tripping should alleviate any concerns with simultaneous outages due to lightning.</p> <p>The Applicant will address potential simultaneous outages of the Project and the existing 500 kV line due to equipment failures by maintaining appropriate separation distances between the Project and the existing 500 kV transmission line.</p> <p>The Applicant will evaluate the steady state and dynamic performance of the regional transmission system after a simultaneous outage of the two 500 kV transmission lines for both north and south flow conditions in the electrical design optimization studies for the Project. These studies should identify any potential electrical problems with this event and if there are any reasonable electrical design considerations that will improve the performance of the system during this event.</p>

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Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Public Services & Utility Systems, <i>continued...</i>	<p>Once the Project is in service, the reliability impacts in the United States of a simultaneous outage of the Project and the existing 500 kV line will be addressed by modifying the existing SPS associated with the four current Manitoba to United States tie lines to include the Project and associated facilities. In the event of an unexpected simultaneous outage of the Project and the existing 500 kV line, the modified SPS will be set up to preserve the integrity of the system based on the operating studies for the Project.</p>
Radio, Television, and Cellular Telephone	<p>If television or radio interference is caused by the operation of the proposed facilities in those areas where good reception was available prior to construction of the Project, the Applicant will inspect and repair loose or damaged hardware in the transmission line, or take other necessary action to restore reception to the present level, including the appropriate modification of receiving antenna systems if necessary.</p> <p>If interference from corona discharges does occur for an AM radio station within a station's primary coverage area with good reception before the Project was built, satisfactory reception can be obtained by appropriate modification of the receiving antenna system.</p> <p>A two-way mobile radio located immediately adjacent to and behind a large metallic structure (such as a steel transmission line structure) may experience interference because of the signal blocking effects of the structure. Moving either mobile unit by less than 50 feet so that the metallic structure is no longer immediately between the two units should restore communications.</p> <p>If television interference is caused by the operation of the Project, the Applicant will inspect and repair any loose or damaged hardware in the transmission line or take other necessary action to restore reception to the present level.</p> <p>If necessary, the Applicant will work with tower operators to resolve any issues directly related to the Project.</p>
Archaeological and Historic Resources	<p>The Applicant will working with DOE and any consulting parties to develop a Programmatic Agreement (36 CFR 800.14 (b)) for the Project.</p> <p>The Applicant will complete cultural resource surveys and reports in accord with the Programmatic Agreement and implement avoidance and mitigation measures in accord with the Programmatic Agreement.</p>
Water Resources and Floodplains	<p>Utilize matting, ice roads, and low ground pressure equipment to the extent practical to minimize wetland and peatland impacts during construction.</p> <p>Locate structures and disturbed areas away from rivers and lakes, where practicable.</p> <p>Contain stockpiled material away from stream banks and lake shorelines.</p> <p>Install sediment and erosion control prior to construction in accordance with sediment and erosion control plans and permits.</p> <p>Use turbidity control methods prior to discharging wastewater from concrete batching or other construction operations to streams or other surface waters.</p> <p>Spread topsoil and seed in a timely manner.</p> <p>Restrict vehicular activity within riparian corridors.</p>

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Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Water Resources and Floodplains, <i>continued...</i>	<p>Minimize use of heavy equipment when clearing riparian corridors.</p> <p>Structures will be located outside of floodplains to the extent practicable. The Applicant will work with the jurisdictional agencies to determine the best ways to minimize impacts and create appropriate mitigation measures.</p> <p>To mitigate any impacts to water quality, the Applicant will implement the BMP's outlined in the SWPPP, required by the NPDES permitting process. Adjustments may be made in the field to address site specific conditions.</p> <p>To minimize contamination of wetlands due to accidental spilling of fuels or other hazardous substances, the Applicant will develop and implement spill prevention procedures to aid in the prevention of potential contamination due to a fuel or hazardous substance spill. Refueling will occur at sites away from wetlands and waters.</p> <p>Temporary impacts during construction may occur if dewatering is necessary to install the transmission structures or if pumping wells are installed to supply water for concrete batch plant operations. If dewatering or pumping is necessary, water appropriations permits will be obtained from Minnesota DNR. If the dewatered groundwater contains substantial quantities of suspended sediments, then the water will be filtered through silt fence or bio-rolls prior to discharge.</p> <p>The Applicant expects to avoid constructing the transmission line over existing wells. If crossing over wells cannot be avoided, the Applicant will work with existing landowners to develop appropriate mitigation measures.</p> <p>To minimize the potential for contamination of groundwater, SPCC plans will be developed and maintained during the construction and operation of the Project. Oil products and hazardous materials will be stored inside appropriate containment, and any spills of oil or hazardous materials will be mitigated immediately in accordance with the procedures in the SPCC plan.</p>
Wetlands	<p>To minimize contamination of wetlands due to accidental spilling of fuels or other hazardous substances, the Applicant will develop and implement spill prevention procedures to aid in the prevention of potential contamination due to a fuel or hazardous substance spill. Refueling will occur at sites away from wetlands and waters.</p> <p>The Applicant will work with the St. Paul District of USACE to develop a mitigation approach that meets the compensatory requirements of the agency. These requirements will be incorporated into the Clean Water Act Section 404 permit and Section 401 certification issued by USACE and Minnesota Pollution Control Agency prior to construction.</p> <p>The Applicant will avoid major disturbance of individual wetlands and drainage systems during construction. This may be done by spanning wetlands and drainage systems, where practical.</p> <p>The Applicant will utilize construction best management practices (BMP's) such as matting, ice roads, and low ground pressure equipment to the extent practical to minimize wetland/peatland impacts during construction.</p> <p>Crews will access the wetland with the least amount of physical impact on the wetland (that is, shortest practical route).</p> <p>Temporary impacts to wetlands will be restored to pre-construction conditions to the extent practical.</p> <p>Minnesota DNR PWI wetlands will be restored according to provisions in Land and Water Crossing permits. Section 6.17, Water Resources, discusses PWI wetlands.</p>

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Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Wildlife	<p>Surveys will be conducted prior to vegetation removal to avoid impacts on nesting birds and to avoid active nest sites of sensitive species.</p> <p>Appropriate construction windows will be incorporated into the construction schedule to minimize impacts on species such as bald eagle and goshawk in areas where these species are found to be present.</p> <p>The Applicant will work with the US Fish and Wildlife Service and Minnesota DNR to identify potential locations for line marking, such as areas of high avian use, nest sites, feeding areas, and migratory corridors. The Applicant will incorporate industry best practices, which are consistent with APLIC's 2012 guidelines.</p> <p>The Applicant will site the transmission line to avoid bird concentration sites, nesting areas, migratory pathways, and geographic features that act as a funnel, and avoiding habitats that act as breeding grounds or feeding areas to the extent practical.</p>
Rare and Unique Species and Communities	<p>If the ROW is not cleared or mowed in the fall or winter before the breeding season, a qualified biologist will conduct surveys for active nesting birds prior to construction. If active nesting locations are identified during the surveys, the Applicant proposes to avoid nest sites during the breeding season and to identify construction restraints that will avoid disturbance to nesting birds.</p> <p>The Applicant will conduct surveys for sensitive plants during appropriate periods of the growing season to properly identify their presence and/or absence along the selected ROW. If sensitive plants or communities are identified during surveys, individual avoidance and minimization measures will be evaluated and submitted to the appropriate regulatory agencies.</p> <p>The Applicant will conduct surveys for native prairie areas and other sensitive plant communities such as calcareous fens along the selected ROW. If sensitive resources are encountered, construction plans that minimize the impacts, such as shifting structure locations or implementing construction techniques that avoid or minimize impacts on these resources, will be developed and submitted to the appropriate regulatory agencies.</p> <p>Avoidance measures may include shifting the location of structures or implementing construction techniques that avoid and/or minimize impacts on sensitive resources.</p>
Noxious Weeds and Exotic Organisms	<p>Regular, frequent cleaning of construction equipment and vehicles on the right-of-way (ROW) as appropriate.</p> <p>Minimization of ground disturbance to the greatest degree practicable; and rapid revegetation of disturbed areas with native or appropriate non-native, seed mixes.</p> <p>The EI will conduct a field survey of the ROW prior to construction to identify areas that currently contain noxious weeds. Weed surveys during construction will identify infestations of the ROW and staging sites.</p> <p>New infestations within the ROW will be addressed and eradicated as soon as practicable in conjunction with property owners input.</p> <p>Construction vehicles, including the under carriage, will be inspected for weed seed and dirt prior to construction start particularly when traveling from an area identified as contaminated by noxious weeds to an uncontaminated area.</p>

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Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Noxious Weeds and Exotic Organisms, <i>continued...</i>	<p>The introduction and establishment of noxious weeds will be minimized by prompt revegetation of disturbed areas using regional genotype native species where appropriate or by seed based on landowner agreements.</p> <p>No MDA or Minnesota DNR prohibited noxious weed seeds will be allowed in any revegetation seed mix. Seed mix composition will be coordinated with Minnesota DNR on all Minnesota DNR lands.</p> <p>Seed mixes used for the Project will be certified as weed free.</p> <p>Only clean straw mulch will be used; meadow hay will not be allowed as a mulch material.</p>
Recreation and Tourism	<p>Constructing the Project along existing transmission ROWs could minimize impacts on existing recreational resources and tourism. Locating the Project ROW adjacent to other existing utility ROWs will help minimize impacts on previously undisturbed lands.</p> <p>Long-term disturbance of wildlife habitat will be minimized by paralleling existing disturbed corridors. Therefore, impacts on hunting and wildlife could be lessened as a result of these actions. In locations where the corridors will be parallel and expanded, the additional acreage will be minimal and will not greatly change the existing conditions as compared to creating an entirely new corridor in an undeveloped area.</p> <p>Working with landowners through the ROW acquisition process to address unauthorized access concerns.</p> <p>Providing information during construction to inform visitors and residents of the activities associated with the Project will provide people with advance notice of what recreational activities may be affected. Signage will be used to inform local recreational users, as appropriate. In this manner, people could plan for other activities or will be made aware of how their activities could be impacted by the construction of the Project.</p> <p>Further evaluate potential visual impacts at the Big Bog State Recreation Area and work with Minnesota DNR to identify mitigation, as appropriate.</p>
Agricultural Production	<p>The Applicant will develop an Agricultural Impact Mitigation Plan (AIMP) as generally required as a Route Permit condition.</p> <p>The Applicant will work with the Minnesota Department of Agriculture to ensure that appropriate mitigation efforts are included and implemented.</p> <p>To the extent practical, soil disturbance and excavation activities in steep slope areas will be avoided.</p> <p>Where disturbance and excavation cannot be avoided entirely, it will be minimized using best management practices (BMPs).</p> <p>Sediment and erosion control plans will be developed that specify the types of BMPs necessary. Depending on the site, BMPs may include installation of silt fence, straw bales, or ditch blocks, and/or covering bare soils with mulch, plastic sheeting, or fiber rolls to protect drainage ways and streams from sediment runoff.</p> <p>Erosion control practices will be inspected during construction, especially during significant precipitation events.</p> <p>Soil compaction in cultivated areas will be treated and restored through tillage operations, for example using a subsoiler.</p> <p>Construction mats will be used as appropriate.</p>

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Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Agricultural Production, <i>continued...</i>	<p>Where rutting occurs, the Project will repair the surface and restore ground vegetation upon completion of work in a given area.</p> <p>All disturbed areas will be revegetated once construction is complete. Seed mixes will be specified based on site characteristics and in accordance with regulatory permits.</p> <p>The introduction and establishment of noxious weeds will be minimized by prompt re-vegetation of disturbed areas using regional genotype native species where appropriate or by seed based on landowner agreements.</p>
Transportation	<p>The Project will be designed in accordance with National Electric Safety Code (NESC) to minimize impacts on transportation. The NESC defines the basic clearance requirements between transmission lines and transportation structures (for example, roadways and railways). The Applicant will work with state and local officials to coordinate and minimize any impacts during construction and operation of the Project.</p> <p>The Route Permit issued by the Minnesota Public Utilities Commission (PUC) will direct the Applicant to comply with Minnesota DOT and all applicable road authorities' management standards and policies during construction. The Route Permit also will direct the Applicant to provide written notice of construction to Minnesota DOT and applicable city, township, and county road authorities. Under the permit, the Applicant will be required to restore the ROW, temporary work space, access roads, abandoned ROW, and any other lands affected by construction. This could include the replacement of living snow fences affected by construction activities.</p> <p>Placement of public utilities on or near state ROW will be designed in accordance with the Utility Accommodation Section of the Minnesota DOT Utility Accommodation and Coordination Manual (Minnesota DOT 2013b). Minnesota Rules 8810.3500, Aerial Lines, requires the placement of aerial lines in the outer 5 feet of the highway ROW. This standard was incorporated into the Accommodation Policy to ensure that lines are placed do not interfere with the free and safe flow of traffic, do not impair the highway or its protected visual quality, do not conflict with any provision of federal, state, or local law, rule, or regulation, or do not unreasonably increase the difficulty or future cost of highway construction or maintenance (Minnesota DOT 2013b).</p> <p>Installation of additional temporary access points will be subject to review and approval of highway officials. Construction staff will implement traffic control measures in accordance with the Minnesota DOT Manual on Uniform Traffic Control Devices (Minnesota DOT 2014).</p> <p>Stringing of new overhead conductors over highways may require installation of temporary wooden pole guard structures or other measures to safeguard the public and construction forces during the stringing process.</p> <p>The Applicant will obtain the necessary permission for railroad crossings with the Railroad in accordance with the Railroad's requirements for clearances, structure placements, offsets, restoration, etc.</p> <p>The Applicant will work with the Railroad to coordinate construction in accordance with the Railroad's requirements.</p> <p>FAA and Minnesota DOT Office of Aeronautics will be notified to address compatibility of the Project with the airport. The Applicant will avoid or minimize impacts to the Piney Pinecreek Border Airport consistent with Minnesota DOT and FAA requirements, as appropriate.</p>

continued...

Table ES-1. Proposed Mitigation Measures, *continued...*

Resource	Mitigation Measures
Transportation, <i>continued...</i>	<p>The Applicant will work with the owners of private airstrips and with aerial applicators to minimize potential impacts, as appropriate.</p> <p>In areas where there may be regular use of lakes for landings and take off, the Applicant will work with those users, and determine methods to improve visibility, such as installing markers on the transmission line.</p>
Forestry	<p>The timber that is cleared remains the property of the landowner. To the extent practical, the Applicant will work with the landowner to determine a mutually agreeable means of disposing of the cleared material, such as chipping, burning, or stacking for landowner use or sale. Once construction is complete, the ROW will be managed to promote the establishment of forbs and grasses. Shrubs will be allowed to regenerate within the ROW as long as they do not interfere with maintenance, access, and the safe operation of the transmission line.</p> <p>Construction staging areas will be located and arranged in a manner to preserve trees and vegetation to the maximum extent practicable.</p> <p>To the extent practicable, staging areas will be restored to preconstruction conditions.</p> <p>Temporary access roads outside of the ROW will be required. The Applicant will work with local property owners to identify suitable access locations. Temporary roads and other temporarily impacted areas will be restored as appropriate once construction is completed.</p> <p>The Applicant will coordinate with regulatory agencies to identify appropriate measures to avoid and minimize effects on forest resources on federal, state, and county-owned properties.</p>
Mining	<p>The Applicant will work with existing mining operators and mineral lessees to identify the extent of current and planned mining operations and develop appropriate mitigation measures.</p>

Executive Summary

1.0 Introduction

Minnesota Power, an operating division of ALLETE, Inc., (Minnesota Power or Applicant), is applying to the Minnesota Public Utilities Commission (PUC) for a Route Permit to construct the Great Northern Transmission Line (Project), which includes a 500 kilovolt (kV) transmission line between a point on the Minnesota-Manitoba border northwest of Roseau, Minnesota (border crossing) and the existing Blackberry Substation near Grand Rapids, Minnesota, as well as associated substation facilities and transmission system modifications at the Blackberry Substation site, and a 500 kV series compensation station (see Figure 1-1). The Applicant previously has submitted an application for a Certificate of Need (CoN) to PUC and anticipates a decision on whether the Project is needed by May 2015, PUC Docket No. E015/CN-12-1163. Concurrent with this Route Permit Application (Application), the Minnesota Power is applying to the U.S. Department of Energy (DOE) for a Presidential Permit since the Project crosses an international border.

1.1 Summary of Proposed Action

1.1.1 Transmission Line

The Applicant proposes to construct a 500 kV transmission line from the border crossing between Manitoba and Minnesota that has been jointly determined by the Applicant and Manitoba Hydro, to the Blackberry 500 kV Substation near Grand Rapids. Two Route Alternatives and several Segment Options are being proposed for consideration during the permitting process.

While final engineering and design have not been completed, the Project's construction likely would use steel lattice structures for the majority of the route. The anticipated right-of-way (ROW) for the 500kV transmission line is generally 200 feet wide. Ultimately, however, the ROW width will depend on the recommended clearances between the conductor and other facilities along the route. 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. The Applicant will seek permanent easements providing the right to construct, operate, and maintain the transmission line along the full width and length of its ROW.

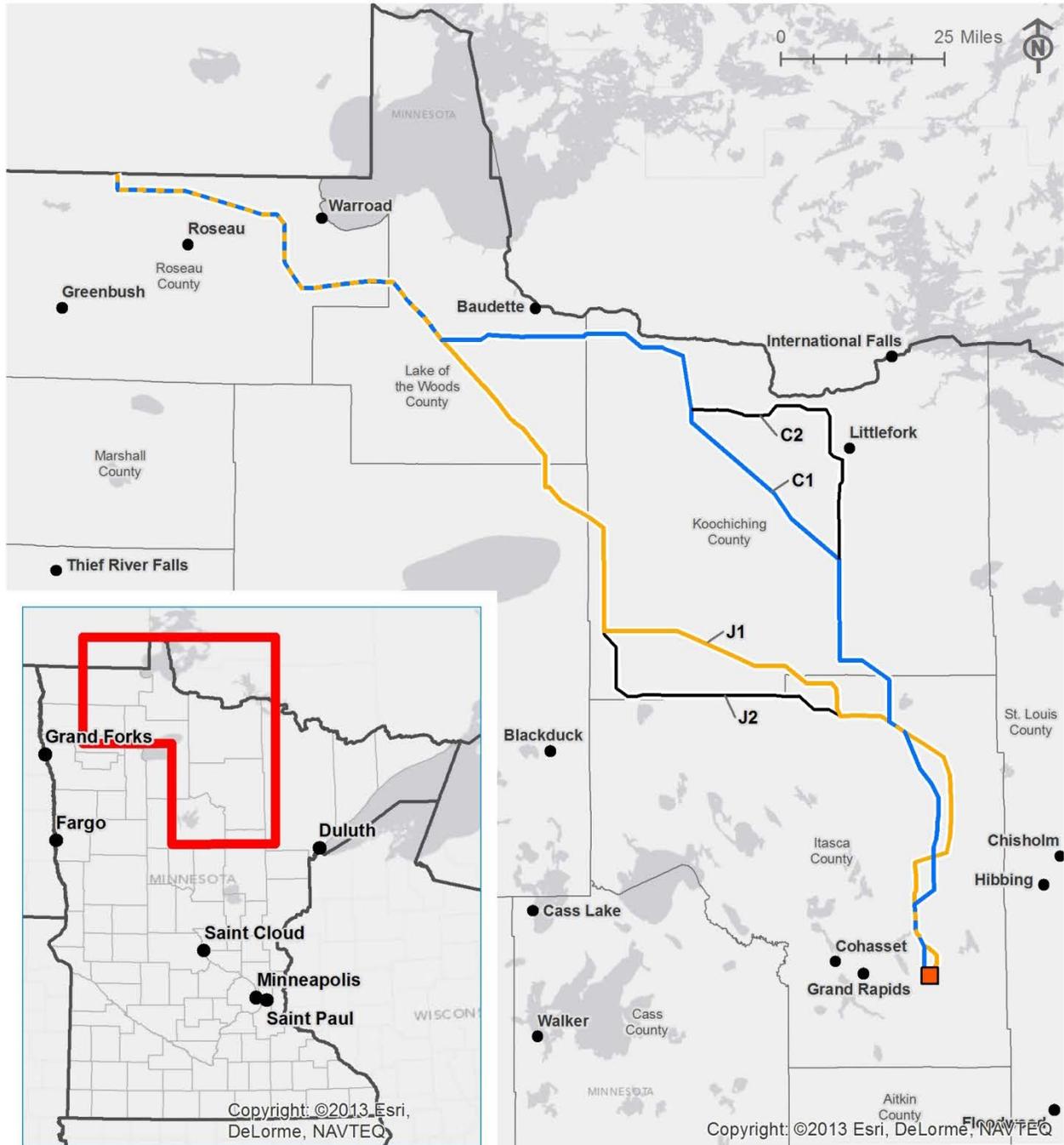
1.1.2 Associated Facilities

The site of the existing Blackberry 230/115 kV Substation near Grand Rapids will be expanded to incorporate the Blackberry 500 KV Substation, located adjacent to and east of the existing substation. The Blackberry 500 kV Substation 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 be rerouted to accommodate the placement and electrical interconnection of the Blackberry 500 kV Substation.



Proposed Route Alternatives

Figure 1-1



Legend

- Blue Route
- Orange Route
- Segment Option
- Blackberry 500 kV Substation
- State Boundary
- County Boundary

Sources: ESRI, NLCD \\mspe-gis-file\GISProj\Large\MinPower\182035\map_docs\CLIENT\Route_Permit\01-1_ProposedRouteAlts.mxd

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 final location for the 500 kV Series Compensation Station will be determined by electrical design optimization studies and final route selection. Permanent impacts for the combined Blackberry 500 kV Substation and 500 kV Series Compensation Station would be 25.0 acres.

1.2 Proposed Project Ownership

1.2.1 Project Applicant

Legal Name of the Applicant

The legal name of the Applicant is Minnesota Power, an operating division of ALLETE, Inc. Minnesota Power has its principal place of business at 30 West Superior Street, Duluth, Minnesota 55802. Minnesota Power is a public utility in the State of Minnesota under Minnesota Statutes Section 216B.02.

Minnesota Power is an investor-owned utility and provides electricity in a 26,000-square-mile electric service territory located in northeastern Minnesota. Minnesota Power supplies retail electric service to 144,000 customers, and wholesale electric service to 16 municipalities, as well as some of the nation's largest industrial customers. A portion of the Project would be located in Minnesota Power's service area; Minnesota Power owns the existing Blackberry Substation.

Communications and Correspondence

All communications and correspondence regarding this Application should be addressed to the following persons:

David Moeller	Mike Donahue	Jim Atkinson
Senior Attorney	Project Manager	Environmental Manager
Minnesota Power	Minnesota Power	Minnesota Power
30 West Superior Street	30 West Superior Street	30 West Superior Street
Duluth, Minnesota 55802	Duluth, Minnesota 55802	Duluth, Minnesota 55802
(218) 723-3963	(218) 355-2617	(218) 355-3561
dmoeller@allete.com	mdonahue@mnpower.com	jbatkinson@mnpower.com

Foreign Ownership and Affiliations

The Applicant is not owned wholly or in part by a foreign government or any instrumentality thereof. The Project may include investment by Manitoba Hydro or an affiliate of Manitoba Hydro. The high-voltage transmission facilities on the Canadian side of the border will be owned and operated by Manitoba Hydro, a Provincial Crown Corporation of Canada.

Existing Contracts with Foreign Entities for Purchase, Sale, or Delivery of Electric Energy

The Applicant has executed a 250 MW power purchase agreement (PPA) with Manitoba Hydro. The Applicant has other purchase and sale agreements with Manitoba Hydro, and also has

purchase and sale agreements in place with Ontario Hydro. Minnesota Power has a DOE export license valid through 2018 that covers current export sales.

Corporate Authority and Compliance with Laws

Appendix J of the Presidential Permit application includes an opinion of counsel and officer verification stating that the construction, connection, operation, and maintenance of the proposed Project is within the corporate power of the Applicant and that the Applicant has complied with, and if the proposed actions are performed in accordance with this Application, will comply with all pertinent federal and state laws.

1.2.2 Other Project Owners

Minnesota Power and Manitoba Hydro are still evaluating the ownership structure that fully addresses federal and state regulatory, Mid-Continent Independent System Operator (MISO), legal and tax issues. Minnesota Power will provide the DOE and PUC final ownership terms upon completion, as PUC has required in previous transmission dockets. Minnesota Power will also provide DOE and PUC updates regarding all applicable MISO facilities construction and interconnection agreements.

1.3 Minnesota Public Utilities Commission Permit Process

1.3.1 Certificate of Need

Minnesota Statutes Section 216B.243 dictates that a Certificate of Need is required for a “large energy facility” as that term is defined in Minnesota Statutes Section 216B.2421. A large energy facility includes, “any high-voltage transmission line with a capacity of 200 kilovolts or more and greater than 1,500 feet in length” (Minnesota Statutes Section 216B.2421, subdivision 2(2)). The Applicant filed an application with PUC October 21, 2013, for a Certificate of Need to construct the Project. The Certificate of Need Application and associated filings can be viewed on PUC’s website at <https://www.edockets.state.mn.us/EFiling/>, PUC Docket No. E015/CN-12-1163 (“Certificate of Need Application”). The Applicant anticipates a PUC decision on the Certificate of Need by May 2015.

1.3.2 Route Permit Process

The Power Plant Siting Act (PPSA) provides that no person may construct a high-voltage transmission line without a Route Permit from PUC (Minnesota Statutes Section 216E.03, subdivision 2). The definition of a high-voltage transmission line under the PPSA is broader than the definition of a high-voltage transmission line under the Certificate of Need statutes. Under the PPSA, a high-voltage transmission line includes a transmission line of 100 kV or more and greater than 1,500 feet in length and associated facilities (Minnesota Statute Section 216E.01; subdivision 4). The proposed Project is a high-voltage transmission line and therefore a Route Permit is required prior to construction. The Route Permit Application and associated filings can be viewed on the state’s eDockets website at <https://www.edockets.state.mn.us/EFiling/>, PUC Docket No. E015/TL-14-21.

1.4 Department of Energy Permit Process

Under Executive Order (EO) 10485, as amended, the DOE has authority to grant Presidential Permits for the construction, operation, and maintenance of electric transmission facilities for projects that cross the borders of the U.S. DOE is authorized to grant the permit if (1) it finds that the permit is “consistent with the public interest” and (2) the permit receives favorable recommendations from the State Department and Defense Department. DOE also has the power and discretion to include conditions in the permit that will ensure the protection of the public interest. According to DOE guidance, its public interest determination is based on an evaluation of “the electric reliability impacts, the potential environmental impacts, and any other factors that DOE may also consider relevant to the public interest.” DOE will serve as the lead federal agency during the National Environmental Policy Act (NEPA) review of the Project.

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