

# 4.0 Route and Alignment Alternatives Proposed during Scoping

## 4.1 Federal and State Alternative Review

U.S. Department of Energy (DOE) and Minnesota Department of Commerce – Energy Environmental Review and Analysis (DOC-EERA) conducted the joint scoping process as described in Section 1.4. This chapter describes the alternatives—which include the proposed Project routes and variations—proposed during the public scoping process selected for detailed study in this Environmental Impact Statement (EIS). A discussion of all the alternatives suggested and/or developed through the public scoping process and considered by DOE and DOC-EERA for purposes of environmental review is provided in Appendix C.<sup>61</sup>

### 4.1.1 Federal Action Alternatives Reviewed Under this EIS

As described in its Notice of Intent (NOI), DOE uses the scoping process “both to help define the environmental issues to be analyzed and to identify the range of reasonable alternatives” (79 Federal Register 36497; see also 40 Code of Federal Regulations (CFR) 1501). The scope of this EIS includes the range of alternatives, including no action (Chapter 3), reasonable alternatives, including DOE’s preferred alternative, and impacts to be considered by DOE and cooperating agencies in the federal environmental review of the proposed Project.

DOE’s proposed federal action is the granting of the Presidential permit for the international border crossing. DOE’s Presidential permit decision is solely for the international border crossing, while the proposed construction, operation, maintenance, and connection of the portion of the transmission line within the United States is a “connected action” to DOE’s proposed action.

DOE’s preferred alternative is to grant a Presidential permit to Minnesota Power’s proposed international border crossing at latitude 49 00 00.00 N and longitude 95 54 50.49 W, roughly 2.9 miles east of Highway 89 in Roseau County, Minnesota.

During the scoping process, commenters proposed five alternative international border crossings. DOE

evaluated the five alternative international border crossings and determined that four of them, should be considered for detailed analysis in this EIS. These alternatives include the Border Crossing Pine Creek Variation, Border Crossing Hwy 310 Variation, Border Crossing 230kV Variation, and the Border Crossing 500kV Variation.

The fifth international border crossing alternative commenters proposed during scoping was the International Boundary Alternative Route Segment. DOE evaluated this international border crossing alternative and determined that it would not be carried forward for more detailed analysis in the EIS. DOE eliminated this alternative because it requires the proposed transmission line to cross the Pine Creek Peatland, which is a Minnesota Department of Natural Resources (MnDNR) Scientific and Natural Area (SNA) protected under state regulation with regard to transmission line crossings.<sup>62</sup>

In addition to the proposed federal action and border crossing alternatives, the proposed construction, operation, maintenance, and connection of the portion of the transmission line within the United States is analyzed in the EIS because it is a “connected action”; an action closely related to the DOE’s international border crossing decision. See 40 CFR 1508.25(a)(1). The Applicant’s proposed route, the Applicant’s alternative routes, the 22 alternative route segments, and nine alignment modifications that were proposed by agencies and the public during scoping were analyzed by DOE in coordination with the DOC-EERA, and were jointly determined to be within the scope of this EIS, and will therefore be studied in detail as described below. More importantly, the analysis of these alternatives related to the construction, operation, maintenance, and connection of the proposed transmission line in this joint federal-state EIS is necessary because the EIS also supports the proposed actions of DOE’s federal cooperating agencies (Section 1.4.2) and the

61 The full text of the Scoping Summary Report is available at: <http://www.greatnortherneis.org> (<http://www.greatnortherneis.org/Files/Scoping%20Summary%20Report%20NOV2014%20v2.pdf>) and on e-Dockets (eDockets Numbers: 201411-104621-01 to 10, 104622-01 to 09, 104623-01 to 10, 104624-01 to 08, 104625-01 to 07, and 104626-01 to 03) at: <http://mn.gov/commerce/energyfacilities/Docket.html?id=33847#edocketFiles>

62 State regulations prohibit crossing the Pine Creek Peatland Scientific and Natural Area (SNA) unless no feasible and prudent alternative exists. Minnesota Rules, part 7850.4300, subpart 2. There are existing potential feasible and prudent alternatives for this crossing; therefore, DOE rejected this alternative.

Minnesota Public Utility Commission's (MN PUC) Route Permit decision.<sup>63</sup>

The DOE's Scoping Summary Report (Appendix C) provides details on the alternative route segments and alignment modifications proposed during scoping.<sup>64</sup> Only one of the five alternative border crossing alternatives suggested during scoping, the International Boundary Alternative Route Segment, was determined by DOE to not be a reasonable alternative for purposes of this EIS. This border crossing alternative was eliminated because it would have crossed a State of Minnesota SNA – an area through which transmission infrastructure is prohibited by Minnesota Rules, part 7850.4300. During the scoping process, 11 additional alternative route segments were proposed in addition to the 22 alternative route segments previously discussed. But DOE, in cooperation with the DOC-EERA and the federal cooperating agencies, eliminated them from further consideration based on the rationale provided in the DOC-EERA comments to the MN PUC (including, but not limited to, considerations related to technical, legal, and economic feasibility of an alternative route segment or whether an alternative route would mitigate a potential impact from the proposed Project).<sup>65</sup>

### 4.1.2 State Alternatives Reviewed Under this EIS

The MN PUC route permit regulations allow anyone to suggest alternative routes during the scoping process for evaluation in the EIS. The DOC-EERA then recommends which of the alternative routes, if any, to study in detail in the EIS. The alternatives selected for detailed study and the routes proposed by the Applicant must be evaluated in the EIS. There were 33 alternative route segments proposed by the public during scoping (including five new

border crossings) and nine alignment modifications. Following DOC-EERA evaluation<sup>66</sup> and MN PUC's consideration, the DOC issued its Scoping Decision on January 8, 2015.<sup>67</sup> The Scoping Decision specifies that the EIS will evaluate the Applicant's proposed border crossing, route(s) and associated facilities, four new border crossings, 22 new alternative route segments, and nine new alignment modifications (defined below).

## 4.2 Definitions of Key Terms

The key terms used in this section as well as in the following chapters of the EIS are defined below.

**Sections** – The proposed Project is divided into three geographic sections: West Section, Central Section, and East Section. Within each section, multiple variation areas were developed to address local issues (Table 4-1). The EIS evaluates the issues within each section, progressing from west to east across the project area.

**Variation Areas** – The variation areas are smaller geographic areas that allow evaluation and comparison of local issues, such as wildlife management areas or colocation of transmission lines, across alternatives. Each variation area includes the Applicant's proposed routes and local route alternatives or "variations." The EIS evaluates the local issues within each variation area, progressing from west to east across each section.

**Variations** – The variations are specific combinations of segments within a variation area designed to avoid specific local issues. These variations were developed from alternative route segments identified during the scoping process, as described in Chapter 1. The EIS evaluates the potential environmental impacts and presents the results for the variation(s) and the proposed route(s) within each variation area.

**Hops** – The connector segments, or hops, connect the end of one variation to the beginning of another variation. These hops generally connect variations from west to east from one variation area to a different variation area. The exception is one hop that connects the end of a variation from east to west in order to allow additional flexibility for a complete route alternative. The EIS uses the hops to develop complete route alternatives.

<sup>63</sup> Section 1506.2 of National Environmental Policy Act (NEPA) strongly encourages relevant federal, state, and local agencies to cooperate fully with each other. In such cases the Council on Environmental Quality's (CEQ's) Memorandum to Agencies, Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations (46 FR 18026; March 23, 1991), Question 23A states: "The EIS must contain a complete discussion of scope and purpose of the proposal, alternatives and impacts so that they [EIS] discussion is adequate to meet the needs of local, state, and federal decision makers." DOE's NEPA implementing regulations at 10 CFR part 1021.341(b) also direct DOE programs to, in consultation with other agencies, incorporate any relevant information and requirements in coordinated environmental reviews to the extent possible.

<sup>64</sup> Available in electronic format at: <http://www.greatnortherneis.org/Files/Scoping%20Summary%20Report%20NOV2014%20v2.pdf>

<sup>65</sup> Available at: [http://mn.gov/commerce/energyfacilities/documents/33847/EERA%20Packet%20-%20cltr-C-R-Route%20Alternatives%20\(12-5-14\).pdf](http://mn.gov/commerce/energyfacilities/documents/33847/EERA%20Packet%20-%20cltr-C-R-Route%20Alternatives%20(12-5-14).pdf)

<sup>66</sup> Available at [http://mn.gov/commerce/energyfacilities/documents/33847/EERA%20Packet%20-%20cltr-C-R-Route%20Alternatives%20\(12-5-14\).pdf](http://mn.gov/commerce/energyfacilities/documents/33847/EERA%20Packet%20-%20cltr-C-R-Route%20Alternatives%20(12-5-14).pdf)

<sup>67</sup> Available at [http://mn.gov/commerce/energyfacilities/documents/33847/Scoping%20Decision-SIGNED%20\(1-8-15\).pdf](http://mn.gov/commerce/energyfacilities/documents/33847/Scoping%20Decision-SIGNED%20(1-8-15).pdf)

Table 4-1 Sections and Corresponding Variation Areas

Sections	Variation Areas
West Section	Border Crossing Variation Area
	Roseau Lake WMA Variation Area
	Cedar Bend WMA Variation Area
	Beltrami North Variation Area
	Beltrami North Central Variation Area
Central Section	Pine Island Variation Area
	Beltrami South Central Variation Area
	Beltrami South Variation Area
	North Black River Variation Area
	C2 Segment Option Variation Area
	J2 Segment Option Variation Area
	Northome Variation Area
	Cutfoot Variation Area
East Section	Effie Variation Area
	East Bear Lake Variation Area
	Balsam Variation Area
	Dead Man's Pond Variation Area
	Blackberry Variation Area

**Alignment Modifications** – Alignment modifications are minor adjustments of the transmission line alignment (centerline and associated right-of-way (ROW)) within the proposed routes. During the scoping process, commenters developed and proposed these alignment modifications. The purpose for each alignment modification is to provide a potential alternative for analysis that avoids a specific issue raised by commenters (e.g., sensitive lands, residences, airstrips, etc.). The EIS evaluates issues identified during the scoping process and presents the results for the alignment modification and the comparable segment of the Applicant's proposed route alternative.

### 4.3 Presentation of Alternatives in the EIS

The West Section, Central Section, and East Section route variations and alignment modifications are discussed in Sections 4.3, 4.4, and 4.5, respectively (Map 4-1). These sections provide tables that include the naming convention used in this EIS as well as the corresponding name used in the DOE Scoping Summary Report and DOC Scoping Decision. Chapter 5 and Chapter 6 provide detailed results of the potential environmental impacts analysis.

#### 4.3.1 West Section

There are five variation areas within the West Section: Border Crossing, Roseau Lake WMA, Cedar Bend

WMA, Beltrami North, and Beltrami North Central (Table 4-2, Map 4-2). In addition, there are five connector segments, or hops, that connect variations between the Cedar Bend WMA, Beltrami North, and Beltrami North Central variation areas. The variation areas are described in the following sections.

##### 4.3.1.1 Border Crossing Variation Area

The Border Crossing Variation Area is located in the northwestern portion of the West Section (Map 4-2). The primary issues identified by commenters in this variation area included the location of the border crossing, crossing the large peatland complexes, and the need for the transmission line to avoid the SNAs. The Border Crossing Variation Area is bounded by the U.S. – Canada International Border to the north, overlapped by the Roseau Lake WMA Variation Area to the south, and overlapped by the Cedar Bend WMA Variation Area to the southeast. Table 4-2 and Map 4-3 provide details for the Border Crossing Variation Area.

##### International Border Crossings

There is one proposed international border crossing and four variations within the Border Crossing Variation Area as identified in Table 4-3. These alternatives include the Border Crossing Pine Creek Variation, Border Crossing Hwy 310 Variation, Border Crossing 230kV Variation, and the Border Crossing 500kV Variation (Map 4-3). DOE is considering issuance of a Presidential permit for only the

**Table 4-2 Proposed Routes and Variations in the West Section**

Variation Area	Name in the EIS	Name(s) in the Scoping Decision Document	Length (mi)
Border Crossing	Proposed Border Crossing-Blue/Orange Route	Blue/Orange Shared	25.0
	Border Crossing Pine Creek Variation	Pine Creek Border Crossing Alternative Route Segment	25.7
	Border Crossing Hwy 310 Variation	Hwy 310 Border Crossing Alternative Route Segment	18.6
	Border Crossing 500kV Variation	500kV Border Crossing Alternative Route Segment	10.1
	Border Crossing 230kV Variation	230kV Border Crossing Alternative Route Segment	8.2
Roseau Lake WMA	Proposed Blue/Orange Route	Blue/Orange Shared Route	30.7
	Roseau Lake WMA Variation 1	Roseau Lake WMA Alternative Route Segment 1	44.1
	Roseau Lake WMA Variation 2	Roseau Lake WMA Alternative Route Segment 2	37.5
Cedar Bend WMA	Proposed Blue/Orange Route	Blue/Orange Route	24.7
	Cedar Bend WMA Variation	Cedar Bend WMA Alternative Route Segment	19.6
Beltrami North	Proposed Blue/Orange Route	Blue/Orange Route	16.5
	Beltrami North Variation 1	Beltrami WMA Alternative Route Segment 1 North	15.8
	Beltrami North Variation 2	Beltrami WMA Alternative Route Segment 2	19.7
Beltrami North Central	Proposed Blue/Orange Route	Blue/Orange Route	11.6
	Beltrami North Central Variation 1	Beltrami WMA Alternative Route Segment 4 & 5	13.7
	Beltrami North Central Variation 2	Beltrami WMA Alternative Route Segment 3	12.6
	Beltrami North Central Variation 3	Beltrami WMA Alternative Route Segment 1 South & 5	12.2
	Beltrami North Central Variation 4	Beltrami WMA Alternative Route Segment 1 South	13.5
	Beltrami North Central Variation 5	Beltrami WMA Alternative Route Segment 4 & 1 South	15.0

**Table 4-3 Proposed International Border Crossings and Variations in the West Section**

Variation Area	Name in the EIS	Location of Proposed International Border Crossing	
		Latitude (degrees, minutes, seconds)	Longitude (degrees, minutes, seconds)
Border Crossing	Proposed Border Crossing-Blue/Orange Route	49° 00' 00.00" N	95° 55' 35.79" W
	Border Crossing Pine Creek Variation	49° 00' 00.00" N	95° 54' 50.49" W
	Border Crossing Hwy 310 Variation	49° 00' 00.00" N	95° 46' 8.82" W
	Border Crossing 500kV Variation	49° 00' 00.00" N	95° 32' 23.96" W
	Border Crossing 230kV Variation	49° 00' 00.00" N	95° 30' 26.18" W

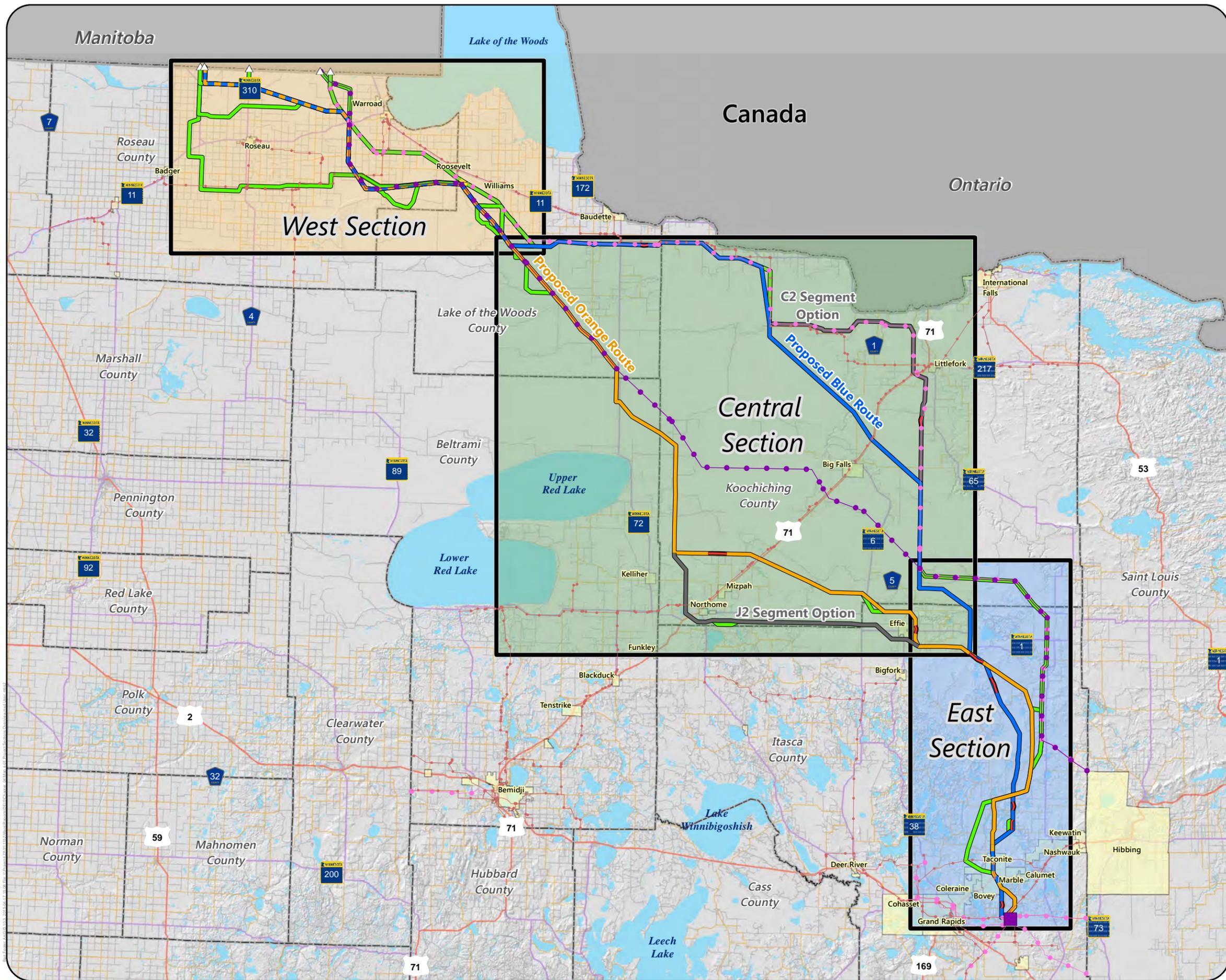
international border crossing as proposed by the Applicant, at latitude 49 00 00.00 N and longitude 95 54 50.49 W, however all alternative international border crossings are analyzed discussed in this EIS.

**Variations**

There are five route alternatives within the Border Crossing Variation Area: the Proposed Border Crossing-Blue/Orange Route, Border Crossing Pine Creek Variation, Border Crossing Hwy 310 Variation, Border Crossing 230kV Variation, and the Border Crossing 500kV Variation (Table 4-2, Map 4-3). The four variations begin at different international border crossing locations than the Proposed Border Crossing-Blue/Orange Route. Each variation in this variation area shares a portion of its alignment

with the Proposed Border Crossing-Blue/Orange Route in this variation area. The Proposed Border Crossing-Blue/Orange Route and the variations have a common endpoint near Minnesota Highway 11 in the southeastern portion of the Border Crossing Variation Area.

As shown in Table 4-2, the Proposed Border Crossing-Blue/Orange Route and the four variations in the Border Crossing Variation Area have different lengths because they start at different locations along the Canadian border but end at a common location in this variation area. The Border Crossing Pine Creek Variation begins furthest west on the border and is longest, while the Border Crossing 230kV Variation begins furthest east on the border, and is the shortest.



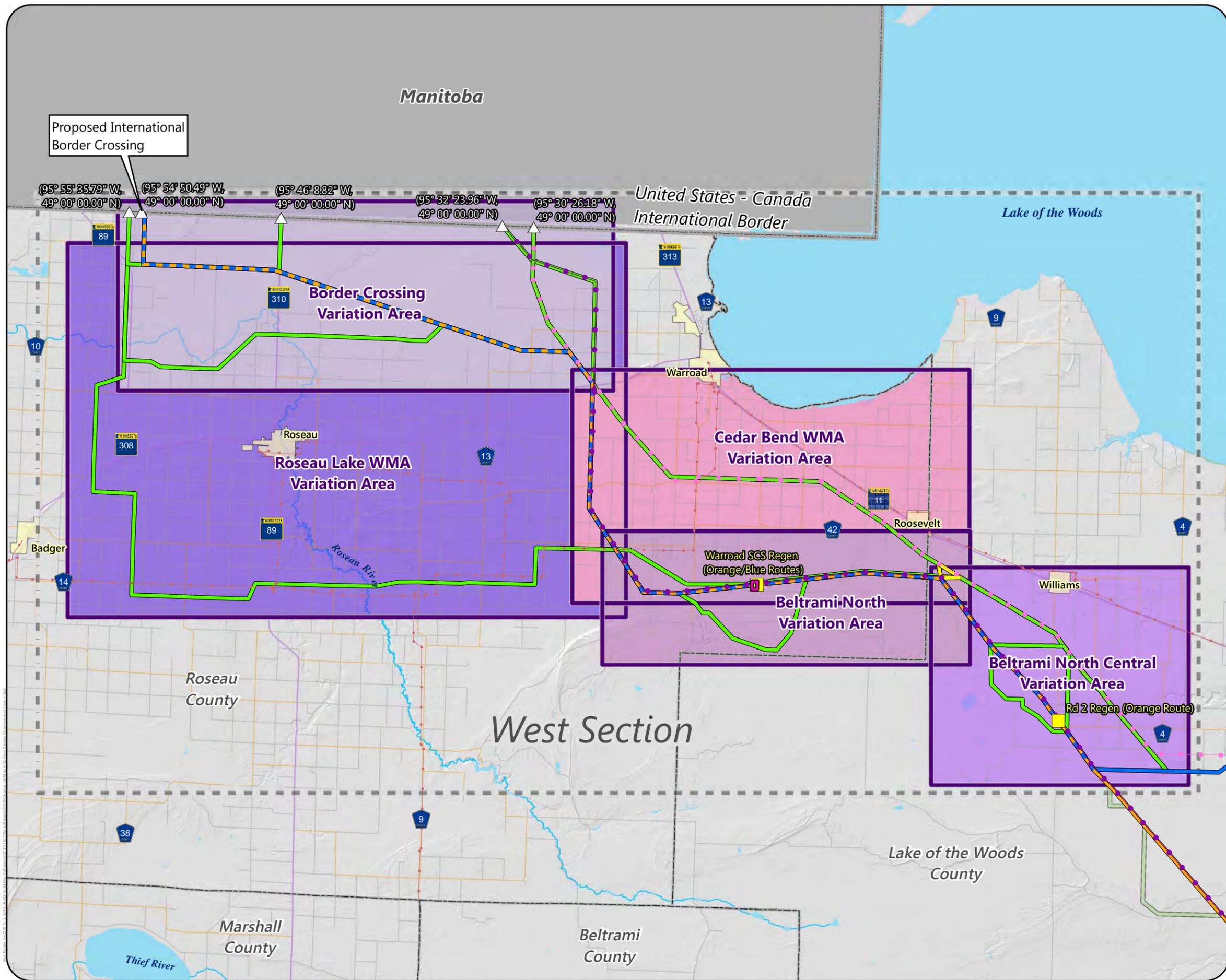
- △ Border Crossing Point
- Proposed Blackberry Substation Location
- Proposed Routes**
  - Blue/Orange Route
  - Blue Route
  - Orange Route
  - Segment Option
- Alternatives**
  - Route Variation
  - Route Variation Hop
  - Alignment Modification
- Existing Transmission Lines**
  - 69 or 115 kV
  - 230 kV
  - 500 kV
- Streets and Highways**
  - US Highway
  - State Trunk Highway
  - County State Aid Highway
  - Local Road
- Project Section
- Municipal Boundary
- County Boundary
- International Boundary



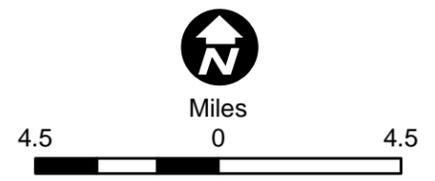
Map 4-1

**PROJECT SECTIONS OVERVIEW**  
 Great Northern Transmission Line  
 Draft Environmental Impact Statement





- △ Border Crossing Point
- Proposed Regeneration Site
- Proposed Routes**
  - Blue/Orange Route
  - Blue Route
  - Orange Route
- Alternatives**
  - Route Variation
  - Route Variation Hop
  - Proposed Series Compensation Station
- Existing Transmission Lines**
  - 69 or 115 kV
  - 230 kV
  - 500 kV
- Streets and Highways**
  - State Trunk Highway
  - County State Aid Highway
  - Local Road
- Boundaries**
  - Variation Area
  - Project Section
  - Municipal Boundary
  - County Boundary
  - International Boundary



Map 4-2  
**WEST SECTION OVERVIEW**  
 Great Northern Transmission Line  
 Draft Environmental Impact Statement



Manitoba

△ Border Crossing Point

**Proposed Routes**

Blue/Orange Route

**Alternatives**

Border Crossing 230kV Variation

Border Crossing 500kV Variation

Border Crossing Hwy 310 Variation

Border Crossing Pine Creek Variation

**Existing Transmission Lines**

69 or 115 kV

230 kV

500 kV

**Streets and Highways**

State Trunk Highway

County State Aid Highway

Local Road

Variation Area

Municipal Boundary

International Boundary

Proposed International Border Crossing

(95° 55' 35.79" W, 49° 00' 00.00" N)

(95° 54' 50.49" W, 49° 00' 00.00" N)

(95° 46' 8.82" W, 49° 00' 00.00" N)

(95° 32' 23.96" W, 49° 00' 00.00" N)

(95° 30' 26.18" W, 49° 00' 00.00" N)

Proposed Border Crossing - Blue/Orange Route

Border Crossing Hwy 310 Variation

Border Crossing 500kV Variation

Border Crossing 230kV Variation

Common End Point

Note:  
Anticipated alignments are shown offset for display purposes only. Please refer to more detailed maps for precise alignment placement.

The Applicant will be issued a Route Permit with a specific route width. The proposed route widths are shown in Appendix S.



Miles



Map 4-3

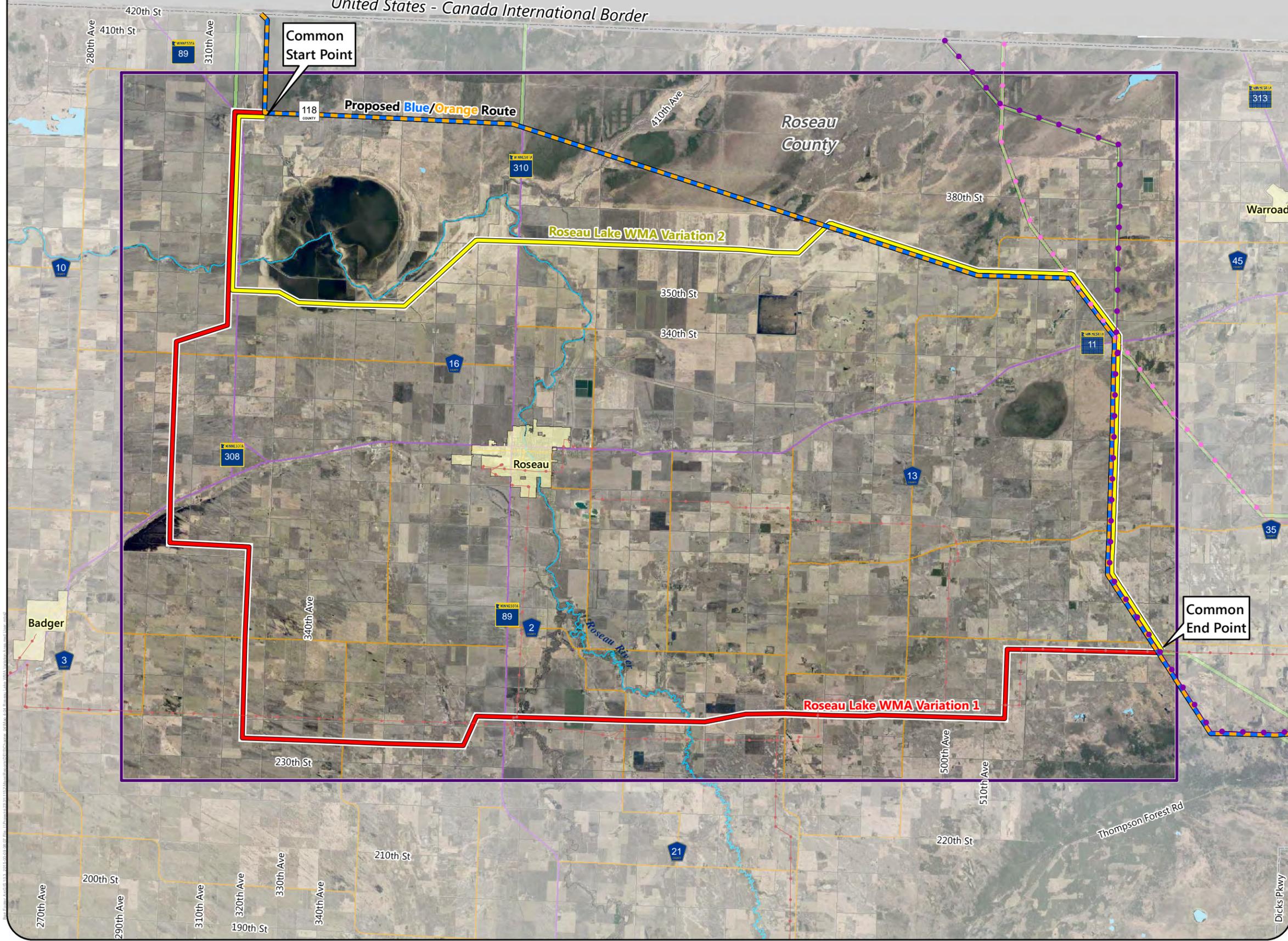
**BORDER CROSSING VARIATION AREA**

Great Northern Transmission Line  
Draft Environmental Impact Statement



Manitoba

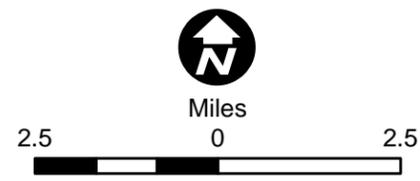
United States - Canada International Border



- Proposed Routes**
- Blue/Orange Route
- Alternatives**
- Roseau Lake WMA Variation 1
  - Roseau Lake WMA Variation 2
- Existing Transmission Lines**
- 69 or 115 kV
  - 230 kV
  - 500 kV
- Streets and Highways**
- State Trunk Highway
  - County State Aid Highway
  - Local Road
  - Variation Area
  - Municipal Boundary
  - International Boundary

Note:  
Anticipated alignments are shown offset for display purposes only. Please refer to more detailed maps for precise alignment placement.

The Applicant will be issued a Route Permit with a specific route width. The proposed route widths are shown in Appendix S.



Map 4-4

**ROSEAU LAKE WMA VARIATION AREA**  
Great Northern Transmission Line  
Draft Environmental Impact Statement



### 4.3.1.2 Roseau Lake WMA Variation Area

The Roseau Lake WMA Variation Area is located in the northwestern portion of the West Section (Map 4-2). The primary issue identified in this variation area is a need for the proposed transmission line to avoid the Roseau Lake Wildlife Management Area (WMA). The Roseau Lake WMA Variation Area is overlapped by the Border Crossing Variation Area to the north, the Cedar Bend WMA Variation Area to the east, and the Beltrami North Variation Area to the southeast (Map 4-2). Table 4-2 and Map 4-4 provide details for the Roseau Lake WMA Variation Area.

#### Variations

There are three route alternatives within the Roseau Lake WMA Variation Area: the Proposed Blue/Orange Route, Roseau Lake WMA Variation 1, and Roseau Lake WMA Variation 2 (Table 4-2, Map 4-4). The Proposed Blue/Orange Route and the two variations have a common start point where the Proposed Blue/Orange Route turns east at County Road 118 in the northwestern portion of the Roseau Lake WMA Variation Area. Variation 2 shares a portion of its alignment with the Proposed Blue/Orange Route in this variation area. The Proposed Blue/Orange Route and the two variations have a common endpoint located southeast of where the Proposed Blue/Orange Route crosses CSAH 2 in the southeastern portion of the Roseau Lake WMA Variation Area. Roseau Lake WMA variations 1 and 2 are longer than the Proposed Blue/Orange Route by 14 and 7 miles, respectively (Table 4-2).

### 4.3.1.3 Cedar Bend WMA Variation Area

The Cedar Bend WMA Variation Area is located in the central portion of the West Section (Map 4-2). The primary issue identified in this variation area is a need for the proposed transmission line to avoid U.S. Fish and Wildlife Service (USFWS) land and the Cedar Bend WMA. The Cedar Bend WMA Variation Area is overlapped by the Border Crossing Variation Area to the northwest, the Roseau Lake WMA Variation Area to the west, the Beltrami North Variation Area to the south, and the Beltrami North Central Variation Area to the southeast (Map 4-2). Table 4-2 and Map 4-5 provide details for the Cedar Bend WMA Variation Area.

#### Variations

There are two route alternatives within the Cedar Bend WMA Variation Area: the Proposed Blue/Orange Route and Cedar Bend WMA Variation (Table 4-2, Map 4-5). The Proposed Blue/Orange Route and Cedar Bend WMA Variation have a common start point just north of the intersection of the Proposed Blue/Orange Route with Minnesota

11, in the northwestern portion of the Cedar Bend WMA Variation Area. The Cedar Bend WMA Variation does not share any portion of its alignment with the Proposed Blue/Orange Route in this variation area. The Proposed Blue/Orange Route and Cedar Bend WMA Variation have a common endpoint located in the area where the existing 500 kilovolt (kV) and 230 kV transmission lines are closest to each other in the southeastern portion of the Cedar Bend WMA Variation Area. The Cedar Bend WMA Variation is about 5 miles longer than the Proposed Blue/Orange Route (Table 4-2).

#### Hops

There are three connecting segments, or hops, located in the southeastern portion of this variation area: Hop 1, Hop 2, and Hop 3 (Map 4-5). These hops provide a connection for the Proposed Blue/Orange Route and Variation in the Cedar Bend WMA Variation Area to the variations in the Beltrami North and Beltrami North Central variation areas.

The Proposed Blue/Orange Route could use the Hop 3 to connect to Beltrami North variation 3 or 4 in the Beltrami North Central Variation Area (Map 4-5). Hop 3 begins where the Proposed Blue/Orange Route turns south to follow the existing 500 kV transmission line, crosses the existing 500 kV transmission line, and connects to the north end of either Beltrami North variation 3 or 4 in the Beltrami North Central Variation Area, which parallel the west side of the existing 230 kV transmission line.

The Cedar Bend WMA Variation could use Hop 1 to connect to the Proposed Blue/Orange Route in the Cedar Bend WMA Variation Area (Map 4-5). Hop 1 begins where the Cedar Bend WMA Variation is just north of where the Proposed Blue/Orange Route turns south to follow the existing 500 kV transmission line. Hop 1 crosses the existing 500 kV transmission line, and connects to the Proposed Blue/Orange Route, which parallels the west side of the existing 500 kV transmission line.

The Cedar Bend WMA Variation could alternatively use the Hop 2 to connect to Beltrami North Central variation 3 or 4 in the Beltrami North Central Variation Area (Map 4-5). Hop 2 begins where the Cedar Bend WMA Variation is just north of where the Proposed Blue/Orange Route turns south to follow the existing 500 kV transmission line, continues south along the west side of the existing 230 kV transmission line, and connects to the north end of either Beltrami North Central Variation 3 or 4 in the Beltrami North Central Variation Area, which continue to parallel the west side of the existing 230 kV transmission line.

### 4.3.1.4 Beltrami North Variation Area

The Beltrami North Variation Area is located in the central portion of the West Section (Map 4-2). The primary issue identified in this variation area is a need by USFWS to consider avoidance of USFWS land.<sup>68</sup> The Beltrami North Variation Area is overlapped by the Roseau Lake WMA Variation Area to the west, the Cedar Bend WMA Variation Area to the north, and the Beltrami North Central Variation Area to the east (Map 4-2). Table 4-2 and Map 4-6 provide details for the Beltrami North Variation Area.

#### Variations

There are three route alternatives within the Beltrami North Variation Area: the Proposed Blue/Orange Route, Beltrami North Variation 1, and Beltrami North Variation 2 (Table 4-2, Map 4-6). The Proposed Blue/Orange Route and these two variations have a common start point just south of where the Proposed Blue/Orange Route intersects CSAH 2 in the northwestern portion of the Beltrami North Variation Area. The Beltrami North Variation 1 and Beltrami North Variation 2 variation both share a portion of its alignment with the Proposed Blue/Orange Route in this variation area. The Proposed Blue/Orange Route and the two variations have a common endpoint in the area where the existing 500 kV and 230 kV transmission lines are closest to each other in the eastern portion of the Beltrami North Variation Area. Beltrami North Variation 1 is less than a mile shorter than the Proposed Blue/Orange Route, while Beltrami North Variation 2 is over 3 miles longer than the Proposed Blue/Orange Route (Table 4-1).

#### Hops

There are two connecting segments, or hops, located in the eastern portion of this variation area: Hop 3 and Hop 4 (Map 4-6). These hops provide a connection for the Proposed Blue/Orange Route and Beltrami North Variation 1 in the Beltrami North Variation Area to the Beltrami North Central Variations 3 and 4 in the Beltrami North Central Variation Area.

The Proposed Blue/Orange Route could use the Hop 3 to connect to Beltrami North Central Variations 3 or 4 in the Beltrami North Central Variation Area

(Map 4-5). Hop 3 begins where the Proposed Blue/Orange Route turns south to follow the existing 500 kV transmission line, crosses the existing 500 kV transmission line, and connects to the north end of either Beltrami North Central Variations 3 or 4 in the Beltrami North Central Variation Area, which parallel the west side of the existing 230 kV transmission line.

The Beltrami North Variation 1 could use the Hop 4 to connect to Beltrami North Central Variations 3 or 4 in the Beltrami North Central Variation Area (Map 4-5). Hop 4 begins at the east end of the Beltrami North Variation and connects to the north end of either Beltrami North Central variations 3 or 4 in the Beltrami North Central Variation Area, which parallel the west side of the existing 230 kV transmission line. Hop 4 would not require crossing over the existing transmission lines.

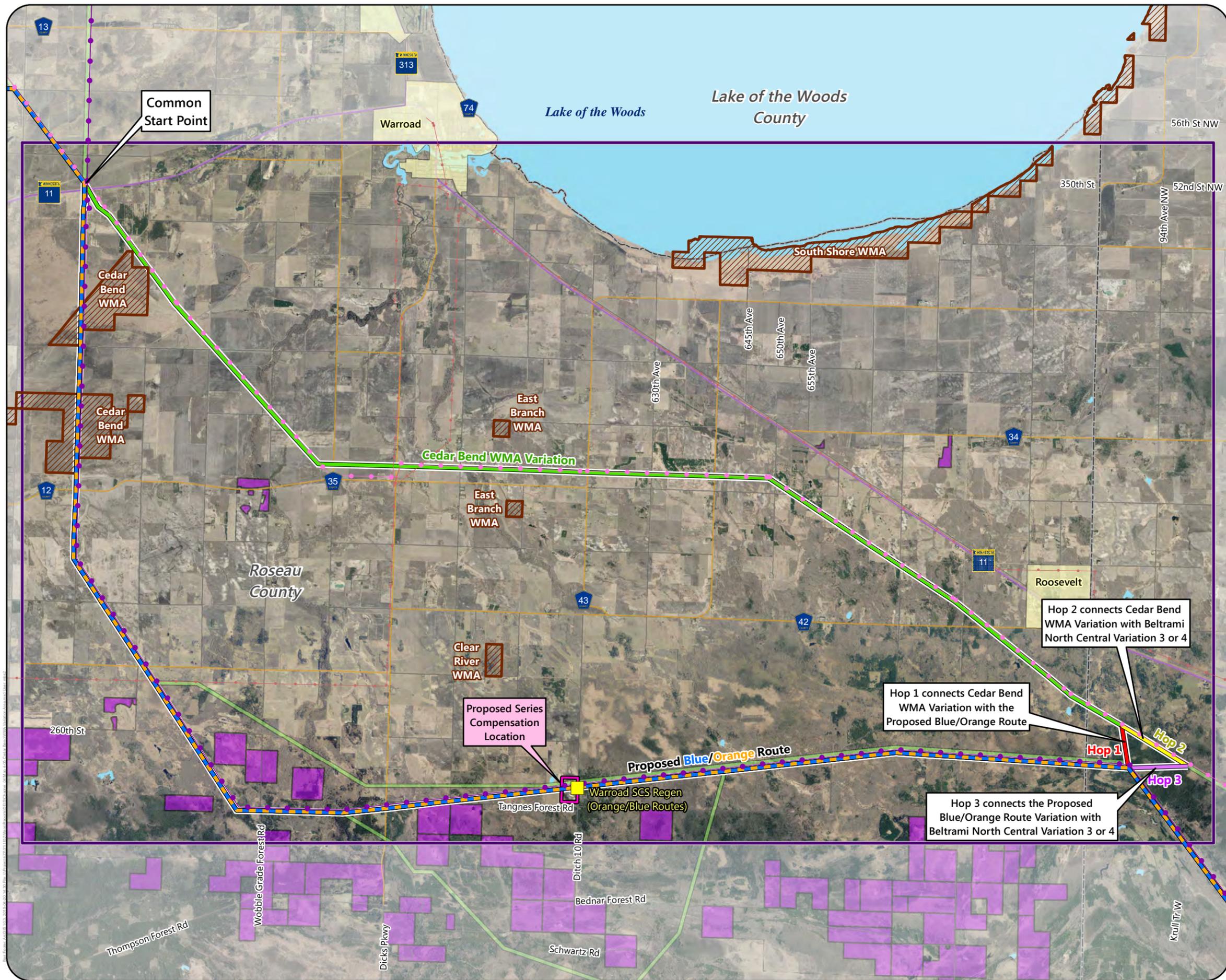
### 4.3.1.5 Beltrami North Central Variation Area

The Beltrami North Central Variation Area is located in the southeastern portion of the West Section (Map 4-2). The primary issue identified in this variation area is a need by USFWS to consider avoidance of USFWS lands. The Beltrami North Central Variation Area is overlapped by the Cedar Bend WMA and Beltrami North variation areas to the northwest (Map 4-2). Table 4-2 and Map 4-7 provide details for the Beltrami North Central Variation Area.

#### Variations

There are six route alternatives within this variation area: the Proposed Blue/Orange Route, Beltrami North Central Variation 1, Beltrami North Central Variation 2, Beltrami North Central Variation 3, Beltrami North Central Variation 4, and Beltrami North Central Variation 5 (Table 4-2, Map 4-7). The Proposed Blue/Orange Route and these variations have a common start point where the existing 500 kV transmission line turns southeast east of Township Road 465 in the northwestern portion of the Beltrami North Central Variation Area. All variations, except Beltrami North Central Variation 3, share a portion of its alignment with the Proposed Blue/Orange Route in this variation area. The Proposed Blue/Orange Route and three of the variations have a common endpoint in the area where the Proposed Blue/Orange Route splits in the southeastern portion of the Beltrami North Central Variation Area; Beltrami North Central variations 4 and 5 have a common endpoint where they intersect the Proposed Blue Route near 53rd Avenue Southwest in the southeastern portion of the Beltrami North Central Variation Area. All variations are longer than the Proposed Blue/Orange Route (Table 4-2).

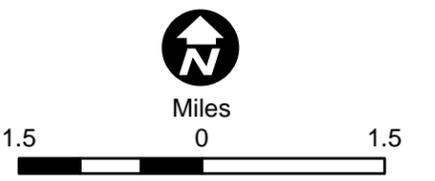
<sup>68</sup> USFWS letter to DOC-EERA that finalizes their route alternative recommendations for the proposed Project. FWS Tails # 03E19000-2013-CPA-0045. November 26, 2014. The letter states that this review is requested by the USFWS because all "ROW requests on Service lands can only be considered after all other alternatives are full examined, as well as the potential impacts to refuge lands. In order for this analysis to be complete, all alternatives must be analyzed and available to the Service for review."



- Proposed Regeneration Site
- Proposed Routes**
- Blue/Orange Route
- Alternatives**
- Cedar Bend WMA Variation
- Hop 1
- Hop 2
- Hop 3
- Proposed Series Compensation Station
- Wildlife Management Area
- USFWS Interest Land
- Existing Transmission Lines**
- 69 or 115 kV
- 230 kV
- 500 kV
- Streets and Highways**
- State Trunk Highway
- County State Aid Highway
- Local Road
- Variation Area
- Municipal Boundary
- County Boundary

Note:  
Anticipated alignments are shown offset for display purposes only. Please refer to more detailed maps for precise alignment placement.

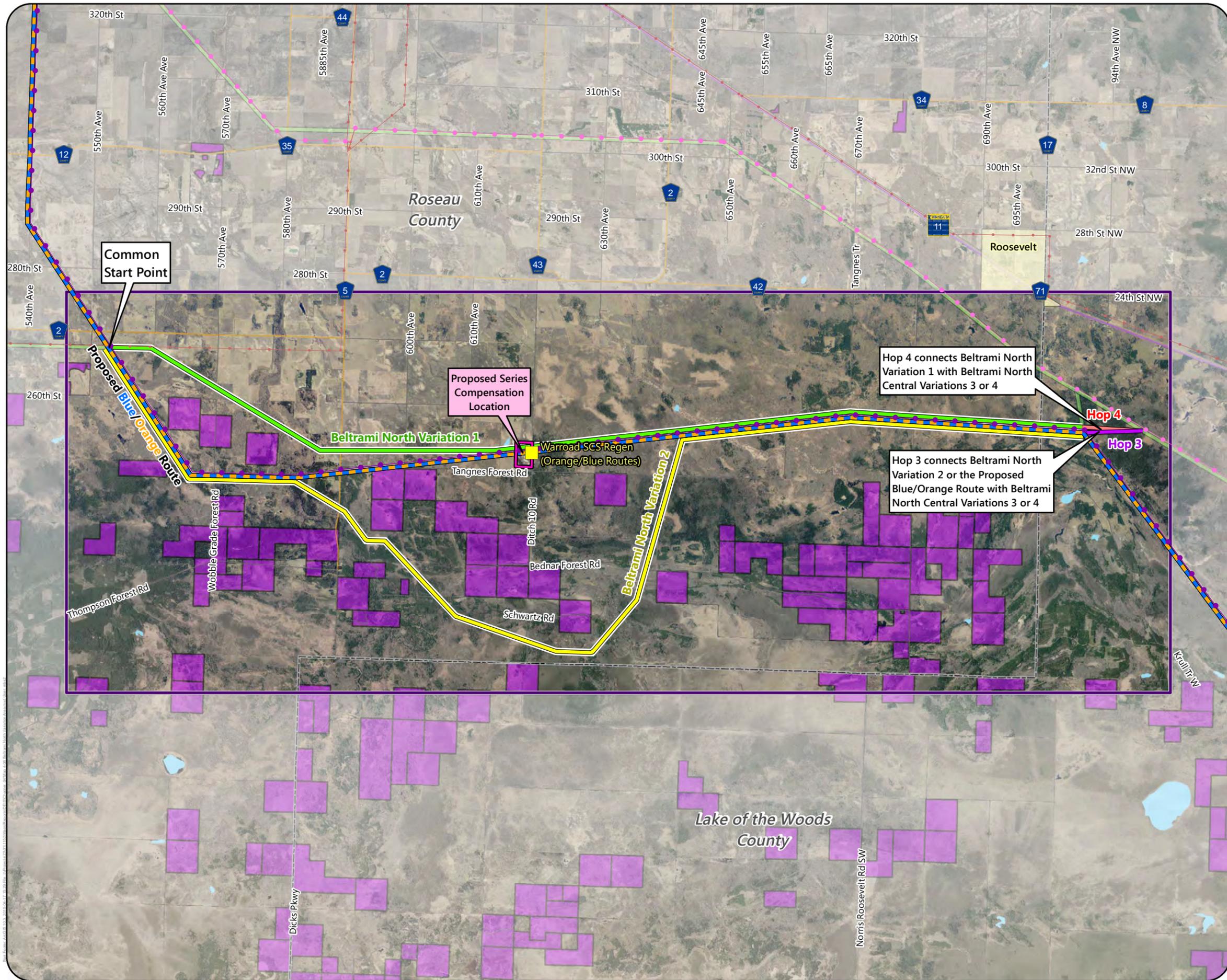
The Applicant will be issued a Route Permit with a specific route width. The proposed route widths are shown in Appendix S.



Map 4-5

**CEDAR BEND WMA VARIATION AREA**  
Great Northern Transmission Line  
Draft Environmental Impact Statement

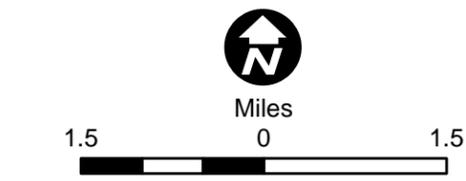




- Proposed Regeneration Site
- Proposed Routes**
- Blue/Orange Route
- Alternatives**
- Beltrami North Variation 1
- Beltrami North Variation 2
- Hop 3
- Hop 4
- Proposed Series Compensation Station
- USFWS Interest Land
- Existing Transmission Lines**
- 69 or 115 kV
- 230 kV
- 500 kV
- Streets and Highways**
- State Trunk Highway
- County State Aid Highway
- Local Road
- Variation Area
- Municipal Boundary
- County Boundary

Note:  
Anticipated alignments are shown offset for display purposes only. Please refer to more detailed maps for precise alignment placement.

The Applicant will be issued a Route Permit with a specific route width. The proposed route widths are shown in Appendix S.

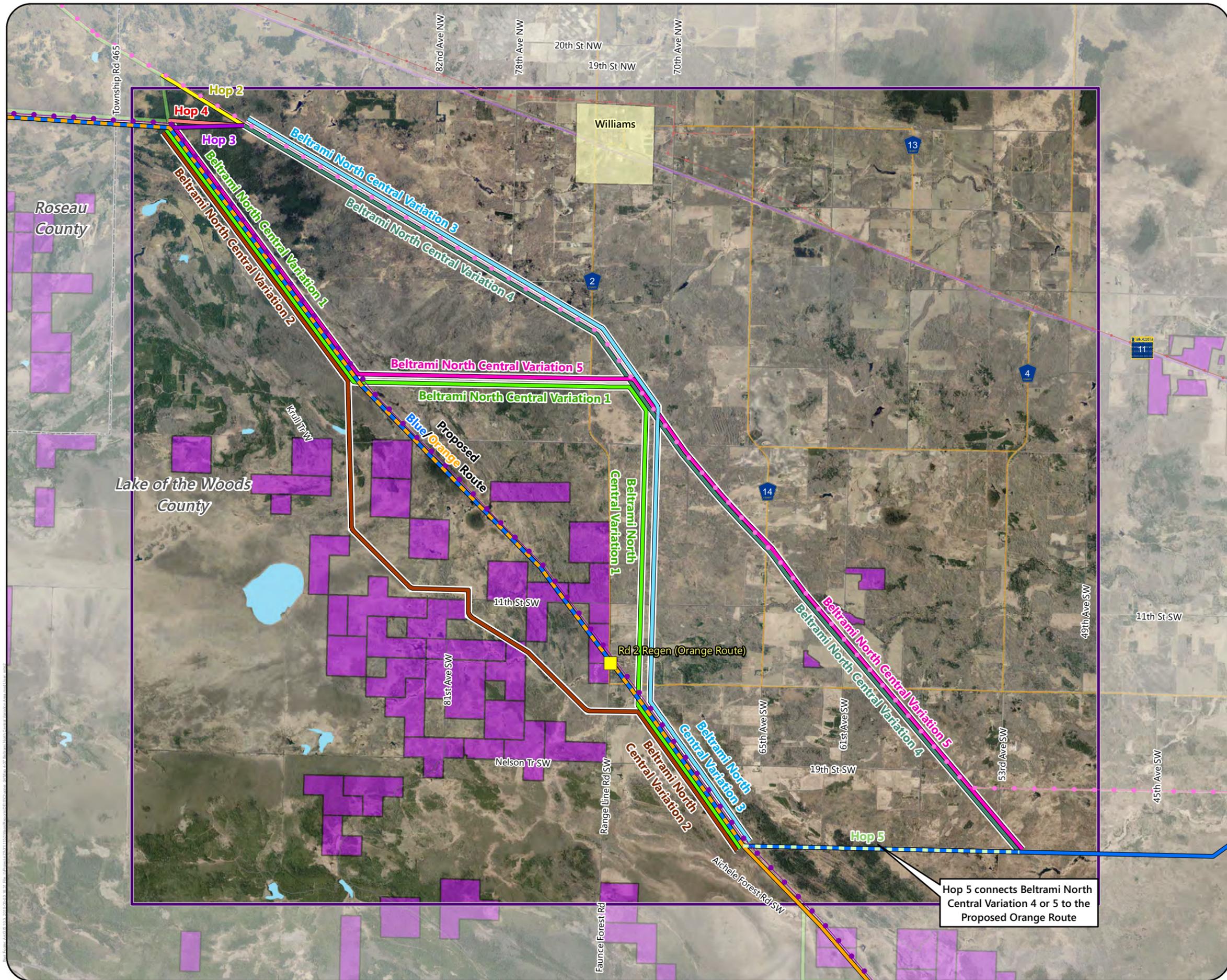


Map 4-6

**BELTRAMI NORTH VARIATION AREA**

Great Northern Transmission Line  
Draft Environmental Impact Statement

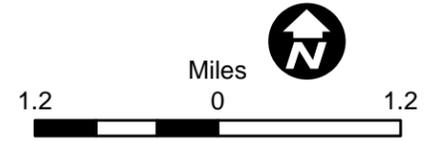




- Proposed Regeneration Site
- Proposed Routes**
- Blue/Orange Route
- Blue Route
- Orange Route
- Alternatives**
- Beltrami North Central Variation 1
- Beltrami North Central Variation 2
- Beltrami North Central Variation 3
- Beltrami North Central Variation 4
- Beltrami North Central Variation 5
- Hop 2
- Hop 3
- Hop 4
- Hop 5
- USFWS Interest Land
- Existing Transmission Lines**
- 69 or 115 kV
- 230 kV
- 500 kV
- Streets and Highways**
- State Trunk Highway
- County State Aid Highway
- Local Road
- Variation Area
- Municipal Boundary
- County Boundary

Note:  
Anticipated alignments are shown offset for display purposes only. Please refer to more detailed maps for precise alignment placement.

The Applicant will be issued a Route Permit with a specific route width. The proposed route widths are shown in Appendix S.



Map 4-7

**BELTRAMI NORTH CENTRAL VARIATION AREA**  
Great Northern Transmission Line  
Draft Environmental Impact Statement



Hop 5 connects Beltrami North Central Variation 4 or 5 to the Proposed Orange Route