

7.4 Cedar Mountain Substation to Helena Substation

7.4.1 Description of Segment Alternatives

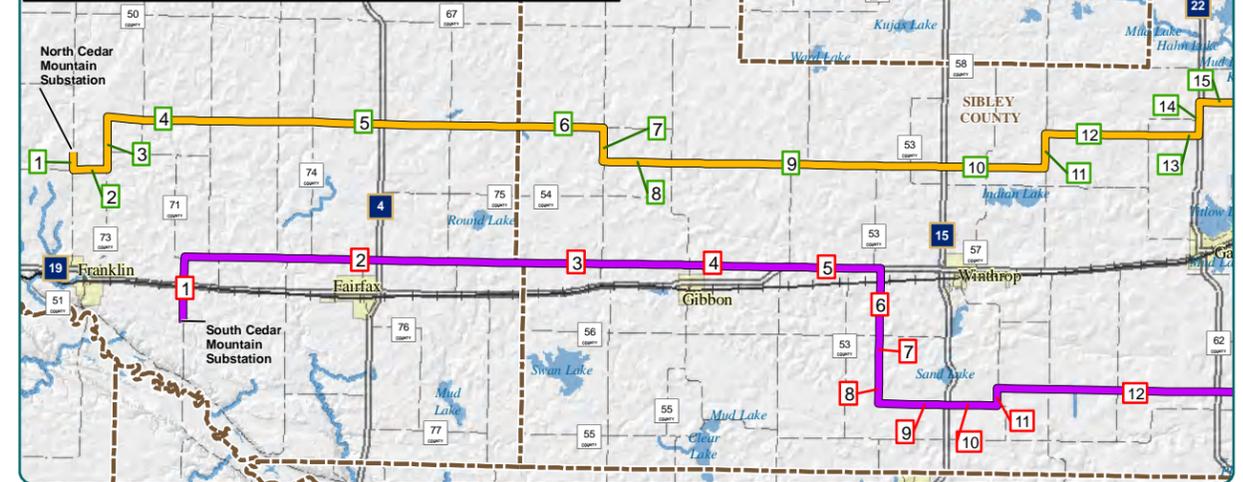
Segment 4 (Cedar Mountain to Helena) begins at the proposed Cedar Mountain Substation and ends at the proposed Helena Substation area west of New Prague. Within Segment 4 there are 15 route alternatives that were suggested during the public comment period. Six of the route alternatives (4P-01 thru 4P-06) are variations on the Preferred Route and nine of the route alternatives (4B-01 thru 4B-09) are variations on both the Preferred and Alternate Routes. There are also five alignment alternatives within Segment 4 that were suggested during the public comment period.

The Preferred and Alternate Routes, all route alternatives and alignment alternatives are described in Section 7.4.1. Section 7.4.4 is an analysis and comparison of impacts by the Preferred and Alternate Routes and all suggested route alternatives.

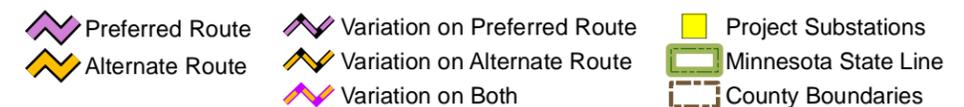
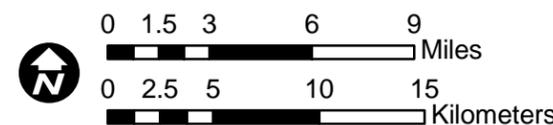
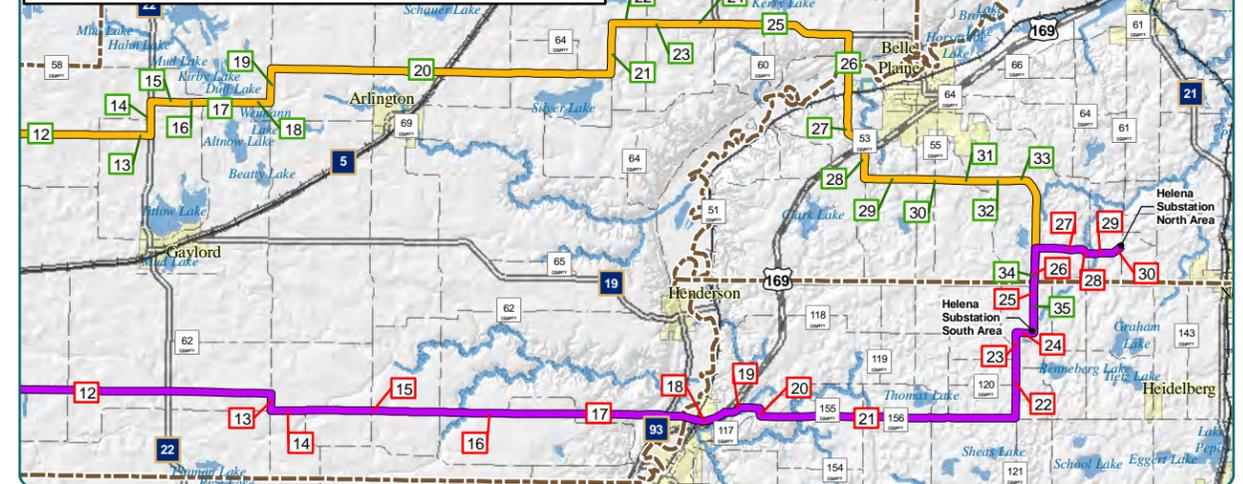
Cedar Mountain to Helena (Preferred Route)			
Turn by Turn	Distance (miles)	Comments	
1	From the south area Cedar Mnt. Substation go north following 420th St. to Cnty Hwy. 71	2.0	
2	Turn east following Cnty Hwy. 71	10.0	
3	Continue east following TR 12	4.0	
4	Continue east following primarily field lines	3.5	
5	Continue east following	3.0	
6	Turn south following TR 45	2.0	
7	Continue south following field lines	1.5	
8	Continue south following TR 44	0.5	
9	Turn east following field lines	2.0	
10	Continue east following TR 238	1.5	
11	Turn north following Cnty Rd. 57	0.5	
12	Turn east following field lines and TR 230	9.5	
13	Turn south following Cnty Hwy 13	0.5	
14	Turn east following Cnty Hwy. 8	1.0	
15	Continue east following TR 89	4.0	
16	Continue east following Cnty Rd. 18	1.8	
17	Continue east following field lines to U.S. Hwy. 169, north of Le Sueur	5.7	Route width is 1 mile to allow flexibility crossing the MN River at the Le Sueur Treatment Pond crossing; Crosses the MN River
18	Continue east following U.S. Hwy. 169 to Cnty Hwy. 28	0.9	
19	Continue east following Cnty Rd. 28	1.0	
20	Turn south following 320th St	0.3	
21	Turn east following Cnty Rd. 156 / 320th St.	7.5	
22	Turn north following Cnty Hwy. 32	2.0	
23	Continue north following field line to 296th St.	0.5	
24	Turn east following 296th St.	0.5	
25	Turn north following field lines to 280th St. E.	1.5	
26	Continue north following Fabor Ave. to 270th St.	1.0	
27	Continue north following Fabor Ave. to 270th St.	1.4	
28	Turn southeast cross-country	0.2	
29	Turn east cross-country	0.7	
30	Turn northeast cross-country to north area Helena Substation	0.3	

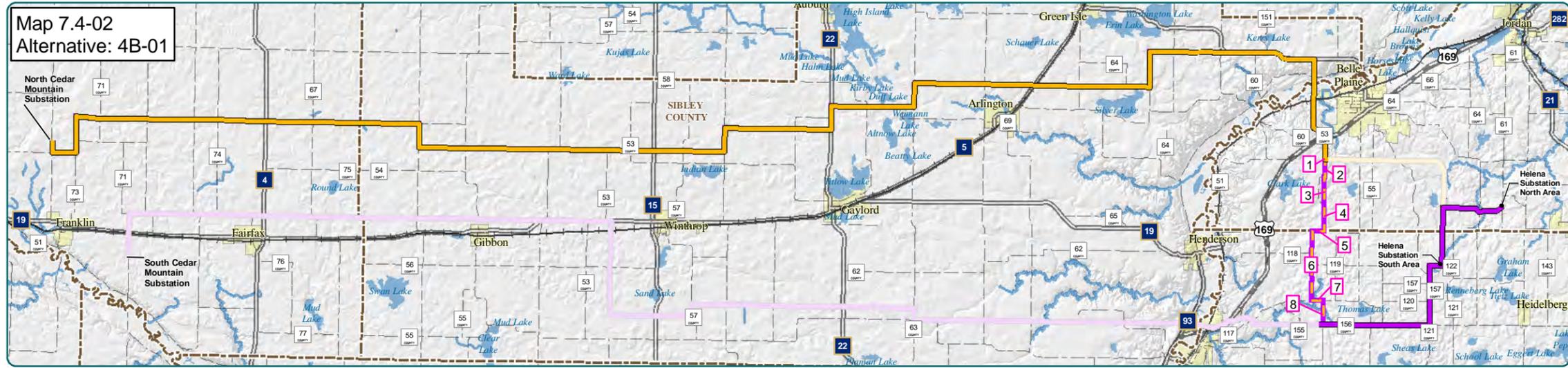
Cedar Mountain to Helena (Alternate Route)			
Turn by Turn	Distance (miles)	Comments	
1	From the north area of the Cedar Mnt. Substation follow CSAH 5 south to CSAH 2	0.5	
2	Turn east following CSAH 2 to 400th St. N	1.0	
3	Turn north following 400th St.	1.5	
4	Turn east following field lines and 700 Ave.	3.0	
5	Continue east following Renville Cnty Hwy. 2	9.0	Crosses TH 4
6	Continue east following Sibley Cnty Hwy. 10	2.5	
7	Turn south following Cnty Hwy. 22	1.0	
8	Turn east following TR 193	2.0	
9	Continue east following Cnty Hwy. 10	7.0	
10	Continue east following field lines to Cnty Hwy. 4	4.0	Crosses TH 15
11	Turn north following Cnty Hwy. 4	1.0	
12	Turn east following field lines and open fields	4.0	
13	Continue east following TR 184 to TH 22	0.5	
14	Turn north following TH 22	1.0	
15	Turn east following TR 72	1.0	
16	Continue east following open fields	0.5	
17	Continue east following Cnty Hwy. 12	1.5	
18	Continue east following open fields to Cnty Hwy. 13	0.5	
19	Turn north following Cnty Hwy. 13	1.0	
20	Turn east following field lines and 220th St.	10.0	Crosses TH 5
21	Turn north following TR 128	1.5	
22	Turn east following TR 161	0.5	
23	Continue east following field lines	1.7	
24	Continue east following TR 160	0.9	
25	Continue east following TR 25	4.0	
26	Turn south following an existing 69 kV transmission line to the Minnesota River Valley	1.8	Crosses the Minnesota River (West Belle Plaine crossing)
27	Continue south and southeast following Stopperman Blvd. to U.S. Hwy. 169	1.8	
28	Continue south following German Rd.	1.0	
29	Turn east following field lines	1.5	
30	Continue east following 250th St.	1.5	
31	Continue east following open fields	0.5	
32	Continue east following 250th St.	1.0	
33	Continue east following the north edge of O'Brien WMA	0.2	
34	Turn south following Fabor Ave.	3.0	Crosses the east edge of Michel Marsh WMA at 270th St.
35	Continue south following field lines to the south area Helena Substation	1.5	The route width is 0.25 mile to allow for flexibility to avoid impacts

Map 7.4-01W - Preferred & Alternate Routes (West)



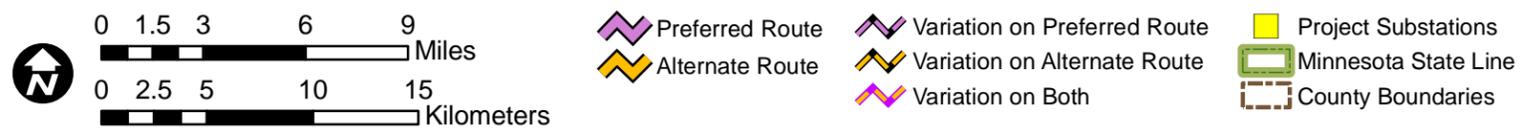
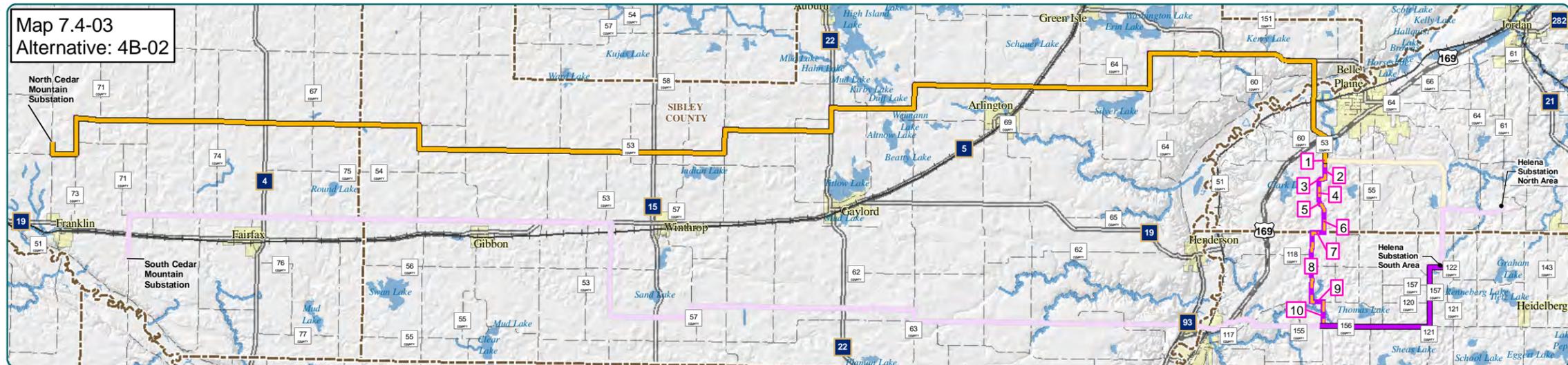
Map 7.4-01E - Preferred & Alternate Routes (East)

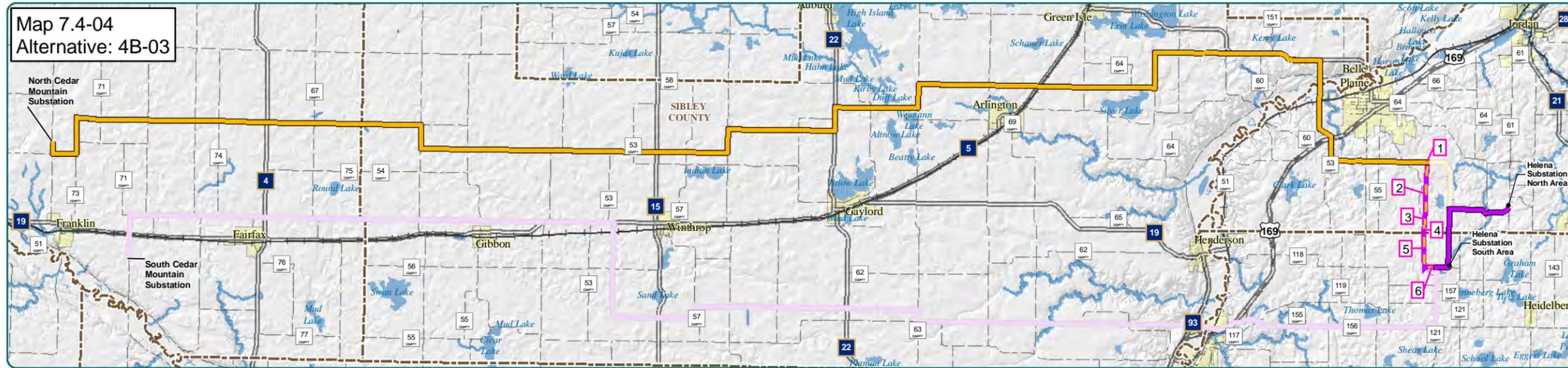




Cedar Mountain to Helena (4B-01)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the alternate route until 1 mile south of U.S. Hwy 169		
2	Continue south following German Rd.	0.7	
3	Continue south cross-country	1.3	
4	Continue south following German Rd. to 280th St. W.	1.0	
5	Turn west following 280th St. W. to 271st Ave.	0.5	
6	Turn south following 271st Ave. to St. Thomas Rd	3.0	
7	Turn east following St. Thomas Rd. to 265th Ave	0.5	
8	Turn south following 265th Ave. to the preferred route	1.0	Connects with preferred route

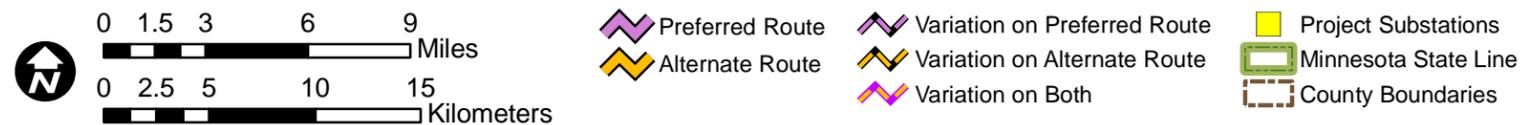
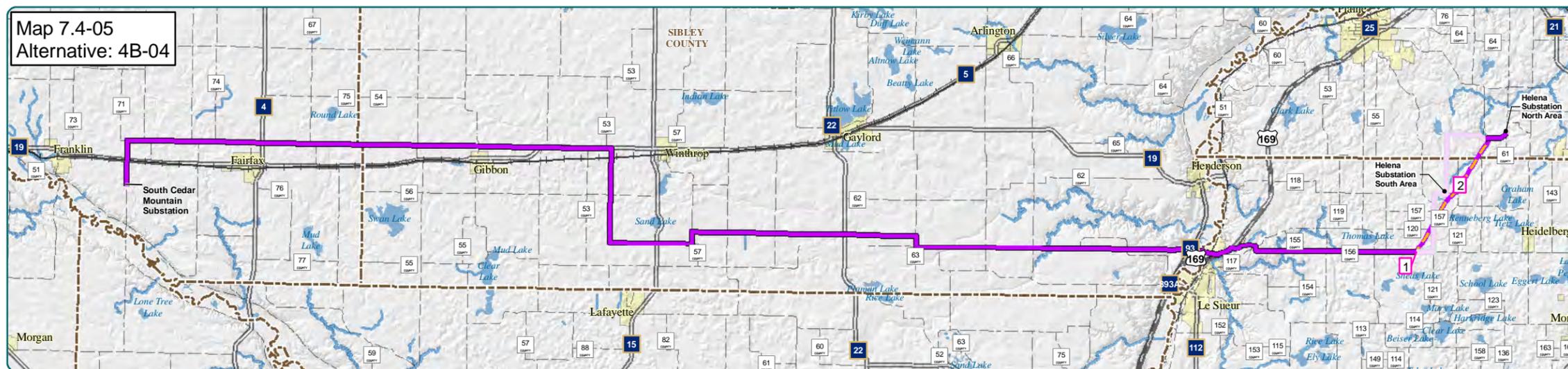
Cedar Mountain to Helena (4B-02)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the alternate route until 1 mile south of U.S. Hwy 169		
2	Continue south following German Rd.	0.7	
3	Turn west continuing to follow German Rd.	0.2	
4	Turn south continuing to follow German Rd.	0.9	
5	Turn southeast continuing to follow German Rd.	0.4	
6	Turn south continuing to follow German Rd. to 280th St. W.	1.0	
7	Turn west following 280th St. W. to 271st Ave.	0.5	
8	Turn south following 271st Ave. to St. Thomas Rd	3.0	
9	Turn east following St. Thomas Rd. to 265th Ave	0.5	
10	Turn south following 265th Ave. to the preferred route	1.0	Connects with preferred route

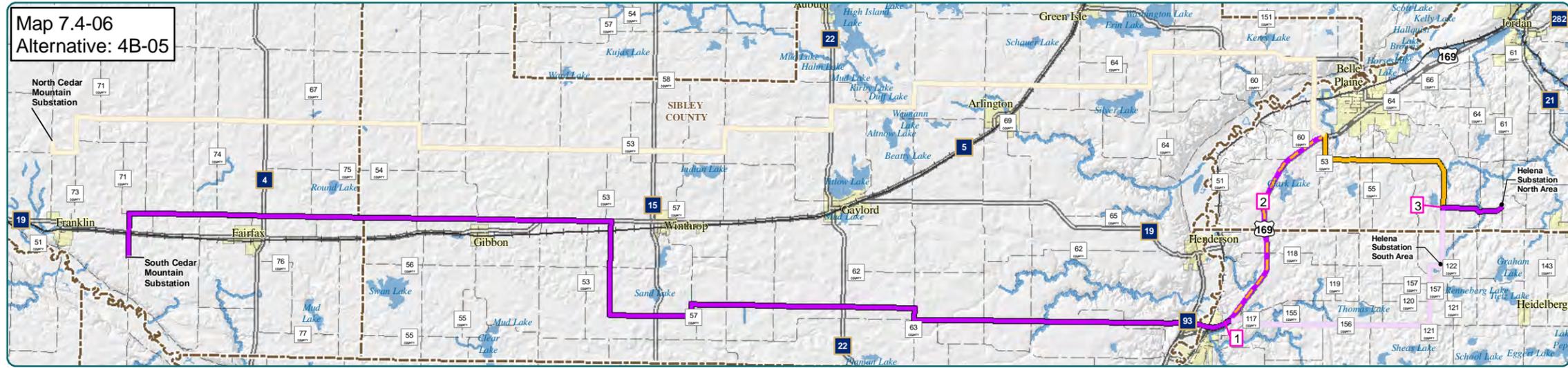




Cedar Mountain to Helena (4B-03)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the alternate route until 0.7 mile west of Fabor Ave.		
2	From 250th St. W. turn south following field lines	2.0	
3	Continue southwest cross-country to State Hwy 5	0.4	
4	Continue south following State Hwy 5	0.6	
5	Continue south following 221st Ave. to 296th St.	1.5	
6	Turn east following 296th St. to the preferred route	0.5	Connects with preferred route

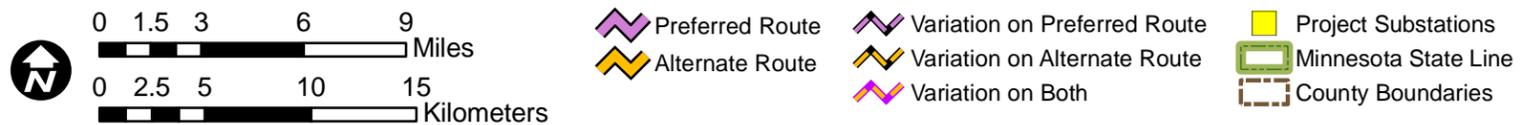
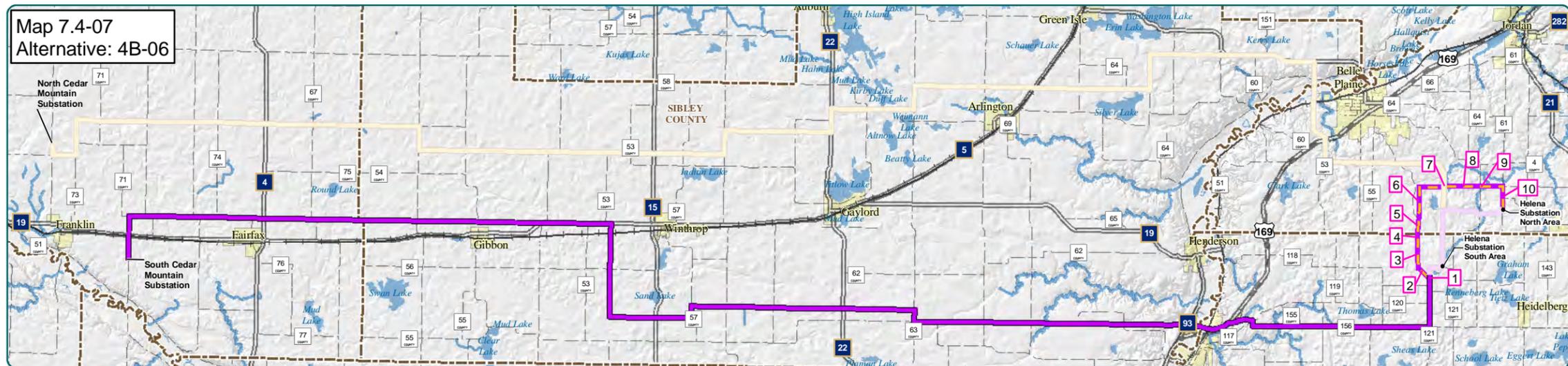
Cedar Mountain to Helena (4B-04)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the preferred route until 0.7 miles west of 221st Ave.		
2	From 320th St. turn northeast following an existing 345 kV line to the preferred route	5.8	Connects with preferred route

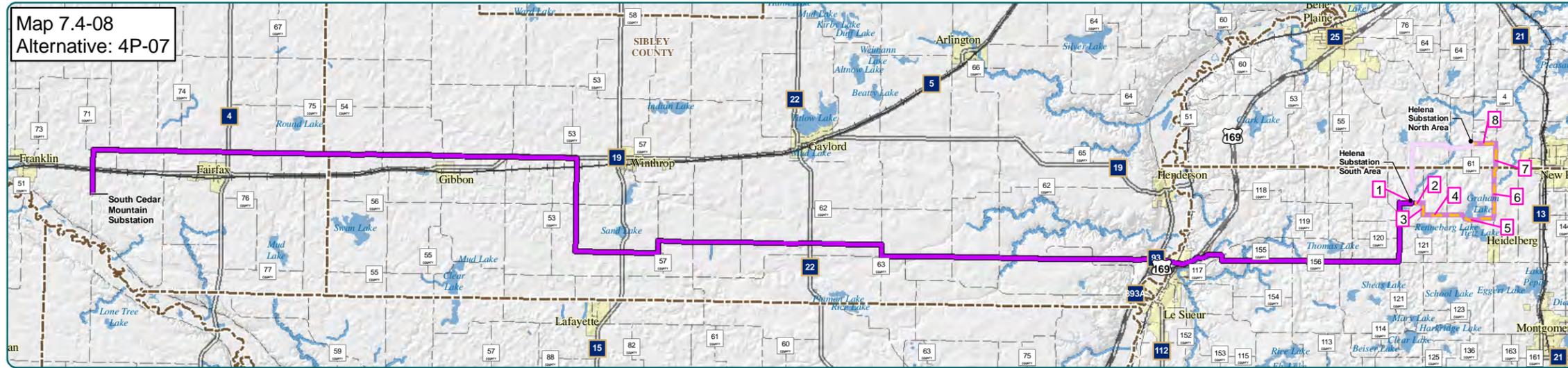




Cedar Mountain to Helena (4B-05)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the preferred route until the preferred route stops following U.S. Hwy 169		
2	From U.S. Hwy 169 continue northeast following U.S. Hwy 169 to the alternate route	9.6	
3	Follows the alternate route to where it intersects the preferred route		Connects with preferred route

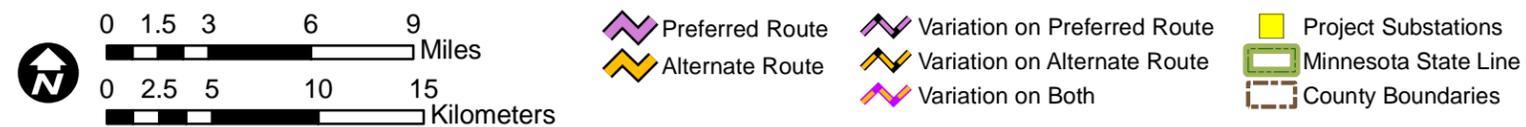
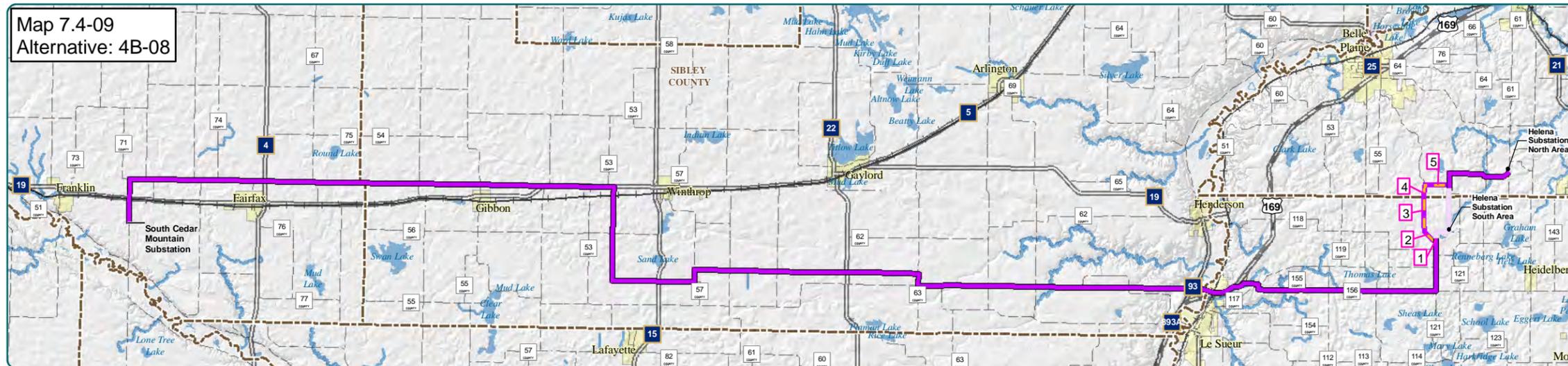
Cedar Mountain to Helena (4B-06)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the preferred route until 0.5 miles south of 296th St.		
2	From 221st Ave. turn northwest to continue following 221st Ave.	0.7	
3	Turn north to continue following 221st Ave	1.5	
4	Continue north following State Hwy 5	0.6	
5	Continue north cross-country	0.4	
6	Continue north following field lines	1.0	
7	Turn east cross-country	1.5	
8	Continue east following field lines	0.5	
9	Continue east cross-country to Aberdeen Ave.	1.5	
10	Turn south following Aberdeen Ave. to the Helena Substation	1.0	

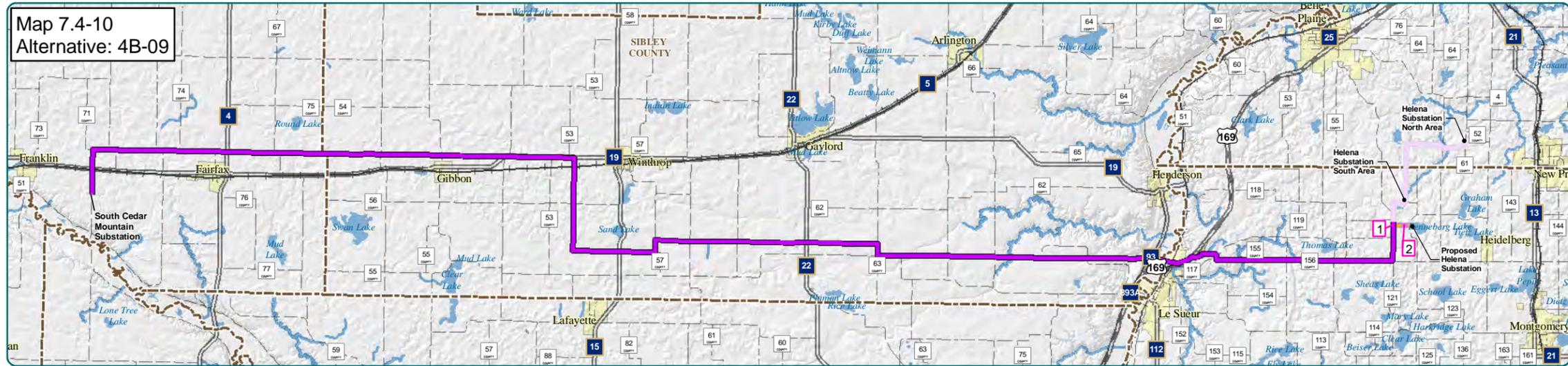




Cedar Mountain to Helena (4B-07)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the preferred route until 0.5 miles west of 211th Ave.		
2	From 296th St. continue east following 296th St. to 211th Ave.	0.5	
3	Turn south following 211th Ave. to 300th St.	0.5	
4	Turn east following 300th St.	1.7	
5	Continue following 300th St. around the south side of Graham Lake to 181st Ave	1.4	
6	Turn north following 181st Ave.	2.1	
7	Continue north following Delmar Ave	1.0	
8	Turn west cross-country to the Helena Substation	1.0	

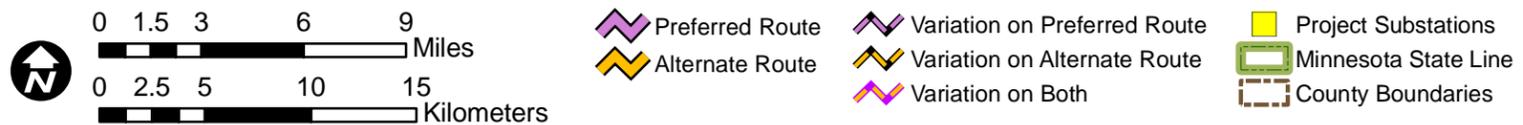
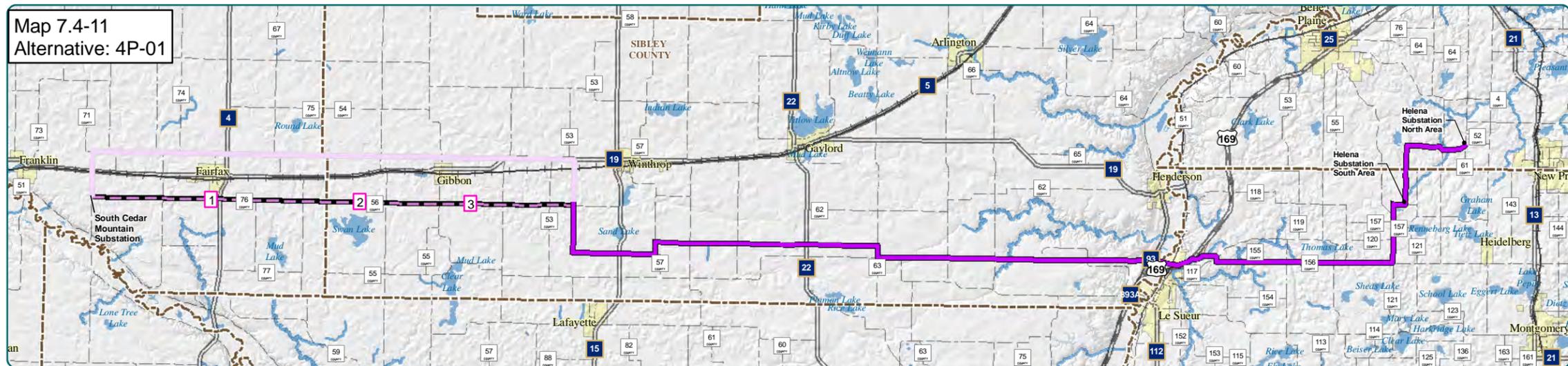
Cedar Mountain to Helena (4B-08)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the preferred route until 0.5 miles south of 296th St.		
2	From 221st Ave. turn northwest to continue following 221st Ave.	0.7	
3	Turn north to continue following 221st Ave	1.5	
4	Continue north following State Hwy 5	0.5	
5	Turn east following field lines to the preferred route	1.0	Connects with preferred route

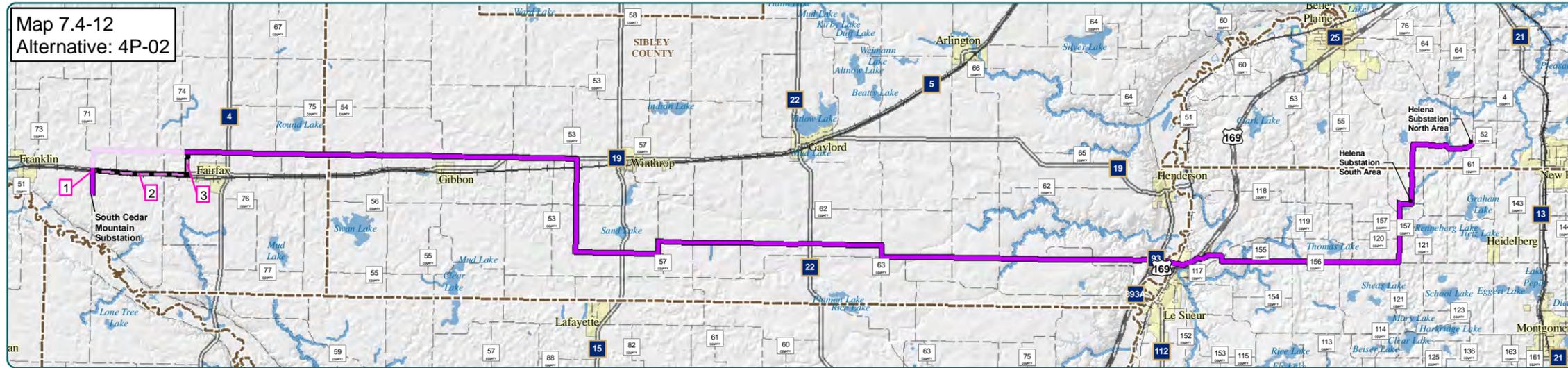




Cedar Mountain to Helena (4B-09)			
Turn by Turn	Distance (miles)	Comments	
1	Follow the preferred route until 306th St.		
2	From 221st Ave. turn east following 306th St. to the suggested (modified south Helena Substation)	0.75	Goes to new proposed Helena Substation

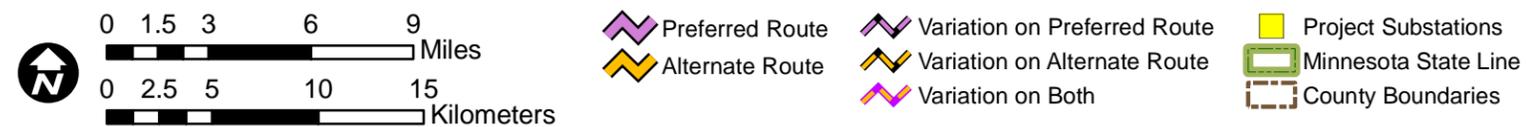
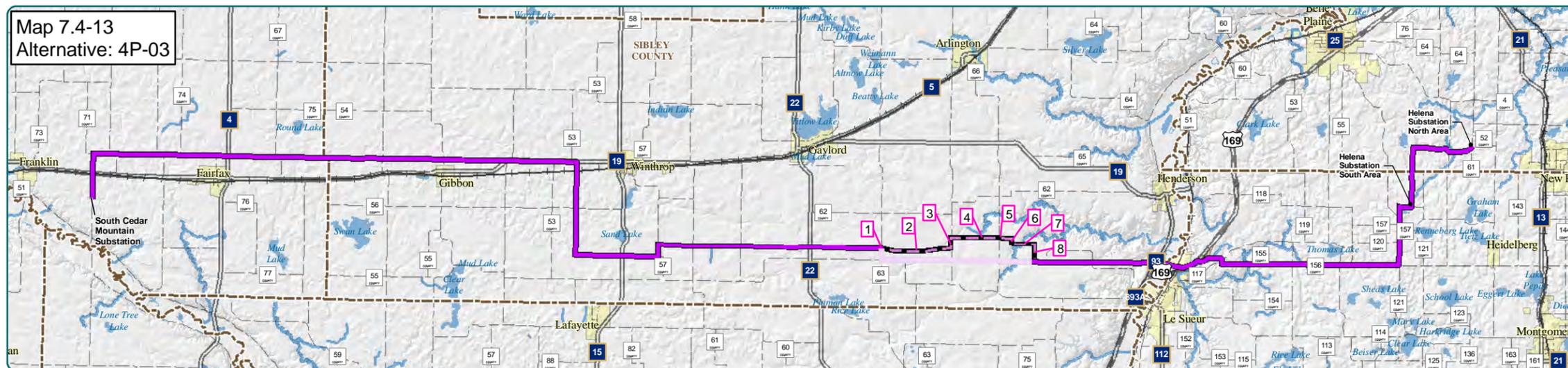
Cedar Mountain to Helena (4P-01)			
Turn by Turn	Distance (miles)	Comments	
1	From the south area of the Cedar Mountain Substation go east following 640th Ave.	10.0	
2	Continue east following Cnty Rd 56	2.5	
3	Continue east following CSAH 25 to the preferred route	8.0	Connects with preferred route

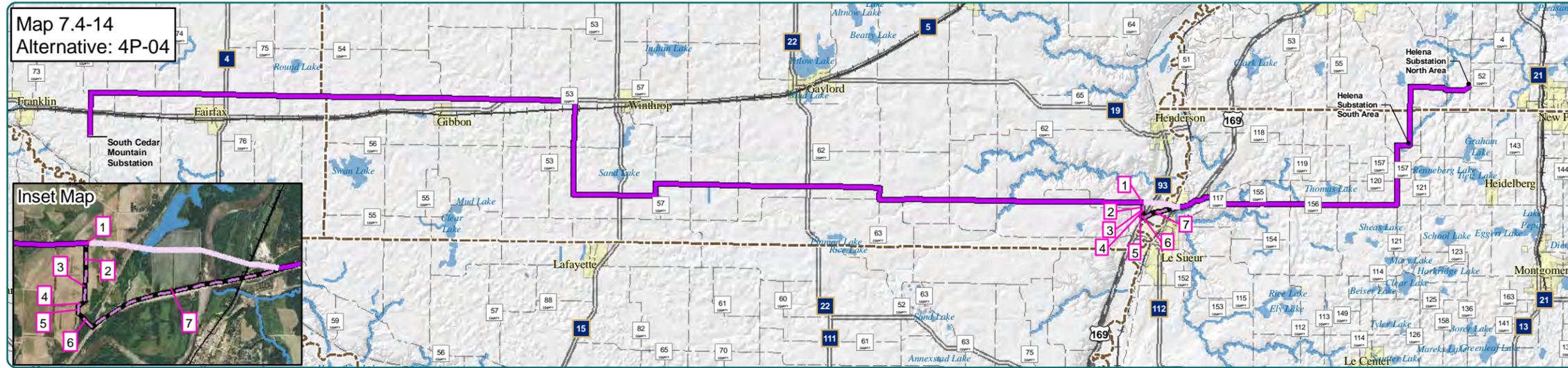




Cedar Mountain to Helena (4P-02)			
Turn by Turn	Distance (miles)	Comments	
1	Follow the preferred route until TH 19		
2	From 420th St. go east following TH 19	4.0	
3	Turn north following field lines to the preferred route		Connects with preferred route

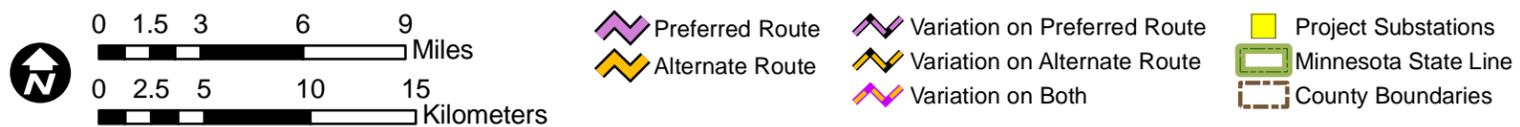
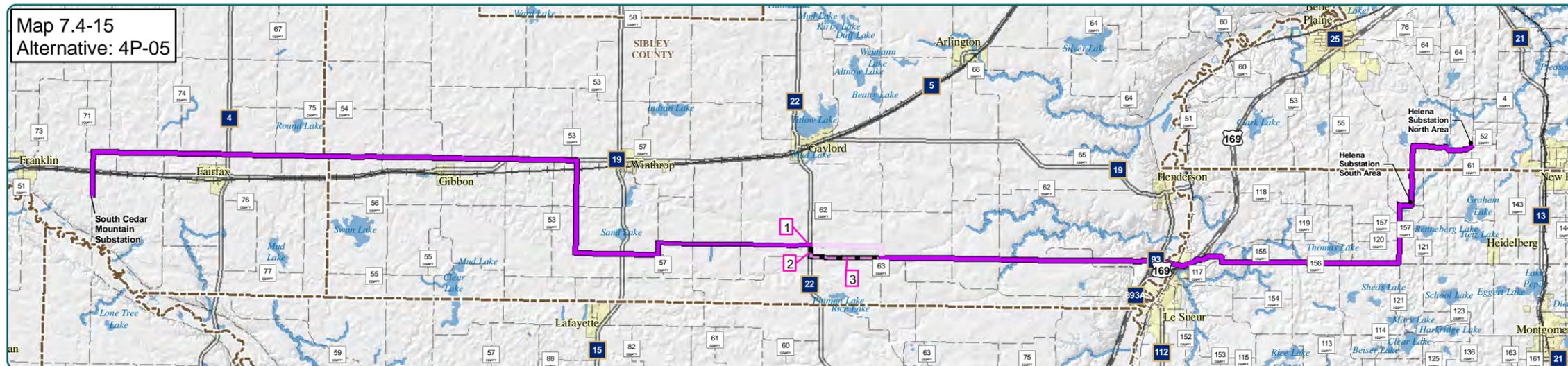
Cedar Mountain to Helena (4P-03)			
Turn by Turn	Distance (miles)	Comments	
1	Follow the preferred route until CSAH 13		
2	At CSAH 13 continue east cross country to CSAH 9	3.0	
3	Turn north following CSAH 9 to TR 222	0.5	
4	Turn east following TR 222 To CSAH 17	2.0	
5	Continue east following field lines	0.5	
6	Turn south following field lines	2.0	
7	Turn east following field lines to 375th Ave	1.0	
8	Turn south following 375th Ave to the preferred route	0.75	Connects with preferred route

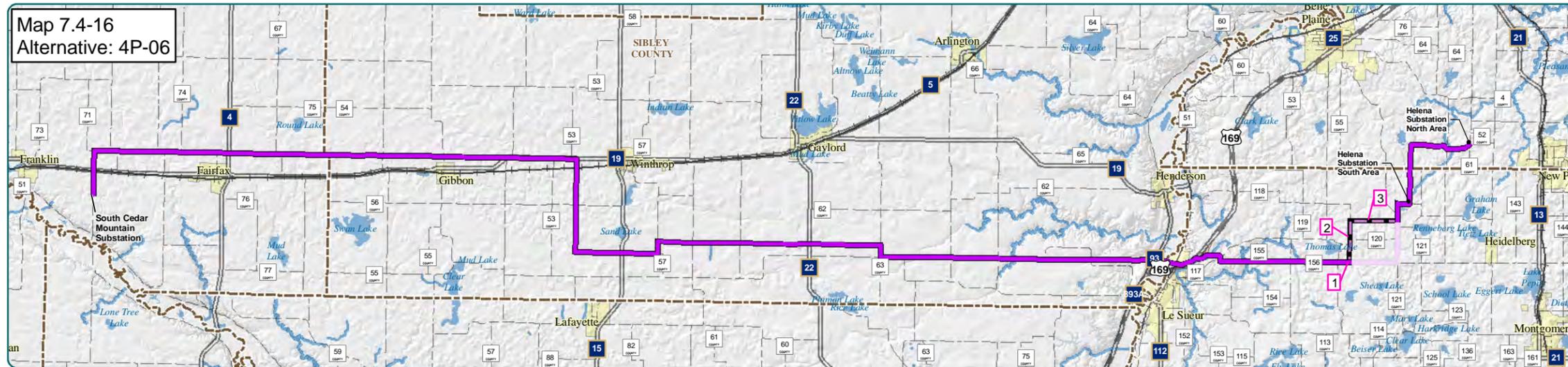




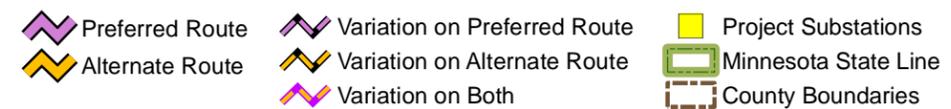
Cedar Mountain to Helena (4P-04)			
Turn by Turn	Distance (miles)	Comments	
1	Follow the preferred route until 3/4 miles east of 335th Ave.		
2	Follow the preferred route until 3/4 miles east of 335th Ave.	0.25	
3	Continue south following field lines	0.2	
4	Turn southwest cross-country	0.1	
5	Turn south cross-country	0.1	
6	Turn southeast cross-country	0.3	
7	Turn east following U.S. Hwy 169 to the preferred route	1.6	Connects with preferred route

Cedar Mountain to Helena (4P-05)			
Turn by Turn	Distance (miles)	Comments	
1	Follow the preferred route until TH 22		
2	From the preferred route turn south following TH 22 to CSAH 8	0.5	
3	Turn east following CSAH 8 to the preferred route	3.0	Connects with preferred route





Cedar Mountain to Helena (4P-06)			
	Turn by Turn	Distance (miles)	Comments
1	Follow the preferred route until 241st Ave.		
2	From 320th St. turn north following 241st Ave to 302nd St.	1.8	
3	Turn east following 302nd St. to the preferred route	2.0	Connects with preferred route

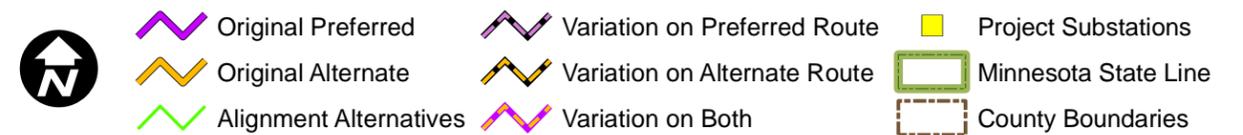
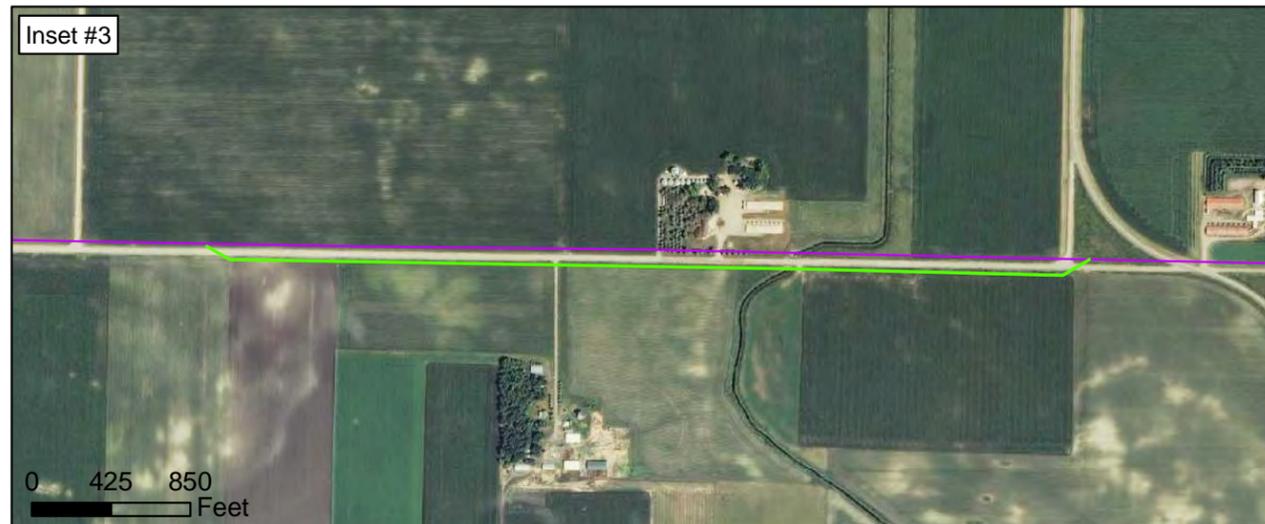
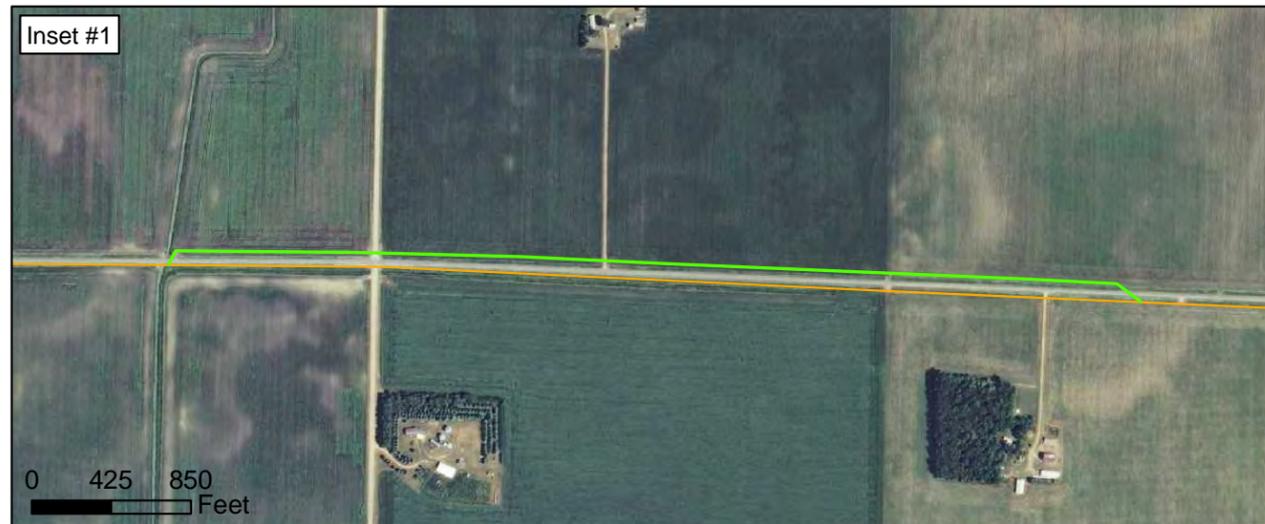
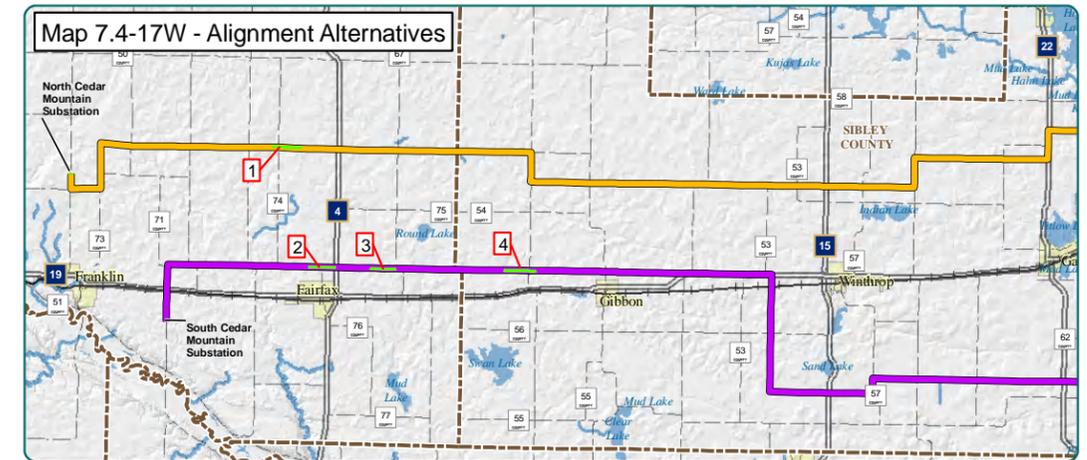


7.4.1.1 Alignment Alternatives

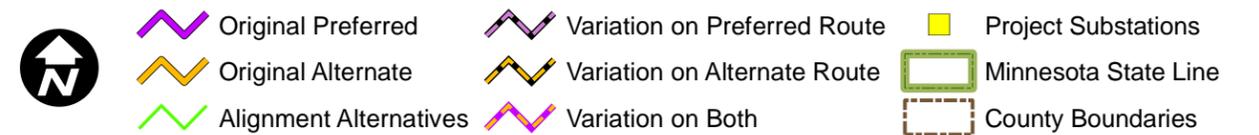
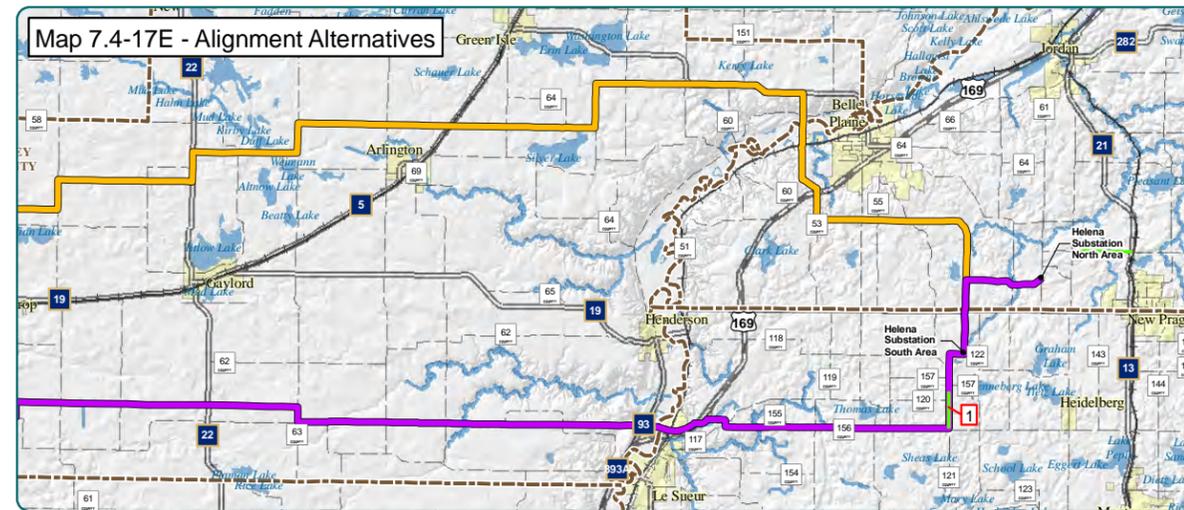
Segment 4 has five alignment alternatives that were suggested during the public comment period.

- 1) Route: Alternate (Inset #1)
Description: Run the line on the north side of County Hwy 2
Purpose: Avoid farm fields where large equipment is being used. Already has a ditch on the south side

- 2) Route: Preferred (Inset #2)
Description: Run the line on the north side of County Rd 74 (660th Ave.) (already the side of the proposed alignment)
Purpose: to avoid cemetery on south side of road.
- 3) Route: Preferred (Inset #3)
Description: Run the line on the south side of County Rd 74 (660th Ave.)
Purpose: to avoid house on the north side that is 120 feet from the center of the road and livestock barns that are 150 feet from the center of the road.



- 4) Route: Preferred (Inset #4, previous page)
 Description: Run the line on the south side of township road
 Purpose: to avoid house that is about 100 feet from the edge of the road.
 Several large trees would have to be removed.
- 5) Route: Preferred (Inset #1, this page)
 Description: Run the line on the west side of County Hwy 32. (already the side of the proposed alignment)
 Purpose: to avoid the homeowner's property and having to remove many large trees that are part of a 700 feet long wind break along the road.



7.4.2 Environmental Setting—Cedar Mountain Substation to Helena Substation

This segment of the route extends from the proposed Cedar Mountain Substation South area to the proposed Helena Substation South area. According to the ECS, Brown, Renville and western Sibley counties are within the Minnesota River Prairie Subsection of the Prairie Parkland Province, while Le Sueur and eastern Sibley counties are within the Big Woods Subsection of the Eastern Broadleaf Forest Province. This section also crosses the Lower Minnesota River. Elevations along this segment of the route range from 698 feet to 1,089 feet AMSL, with the highest elevations occurring in the west and the lowest in the Minnesota River Valley.

Pre-settlement vegetation was dominated by tallgrass prairies with areas of wet prairies in the western portion of the section, and basswood, Northern red oak, sugar maple, and American elm forests were more common in the eastern portion of the section. The primary present-day use of the land along this segment of the route is agriculture; few remnants of native vegetation are present (DNR 2008). Many of the wetlands have been drained and most of the smaller watercourses have been channelized to increase the acreage of land available for agricultural

production. A small percentage of the area remains wetlands or upland forests.

The majority of the communities near the Project area are small agriculture-based towns. Cities include Franklin, Fairfax, Gibbon, Lafayette, Winthrop, Gaylord, Arlington, Le Sueur, Henderson, and Belle Plaine.

7.4.3 Socioeconomic Setting—Cedar Mountain Substation to Helena Substation

This segment is located in a sparsely-populated, rural portion on the western portion of this segment. The route transitions to a more populated area on the eastern half of this line segment. The Preferred Route and Alternate Route cross parts of Renville, Sibley, Le Sueur, and Scott Counties. The primary industries for Renville, Sibley, Le Sueur, and Scott Counties include education, health and social services, agriculture, construction, manufacturing, retail trade, and professional, scientific, management. Table 7.4.3-1 shows the differences in population, minority population percentage, and median age across the counties spanned by this segment of the Project.

7.4.4 Analysis of Segment Alternatives for Cedar Mountain Substation to Helena Substation

The analysis of segment alternatives includes the following:

- Human settlement
- Public health and safety
- Air quality
- Interference
- Property values
- Archaeological and historic resources
- Land use compatibility
- Land-based economics
- Transportation and public services
- Recreation
- Water resources
- Flora and fauna
- Rare and unique natural resources/critical habitat

See Section 6 for a general overview of the potential impacts to the resources listed above and a summary of the mitigation measures that would be utilized to minimize impacts to these resources. General overview maps are present throughout Section 7; however, more detailed maps are provided in Appendix A.

Table 7.4.3-1. Socioeconomic stats in Renville, Sibley, Le Sueur, and Scott Counties

County	2008 Population	Total Minority Population	Minority Population Percentage	Median Age
Renville	15,861	1,332	8.4	41
Sibley	14,954	1,361	9.1	39
Le Sueur	28,042	1,795	6.4	40
Scott	128,937	17,664	13.7	34

Source: U.S. Census Bureau

7.4.4.1 Human Settlement—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Impacts to human settlement have been assessed by looking at a variety of factors including noise, aesthetics, proximity to structures, displacement, tree groves and windbreaks, existing utilities, and domestic water well installation and maintenance. Section 6.1 provides detailed discussion of each of these potential impact areas.

The extent to which particular route alternatives may impact these features is primarily linked to the proximity of the proposed route alternatives to human settlement areas. Aesthetic impacts to humans, for example, are expected to be greatest where the line is located nearest to human settlement features such as homes, businesses, schools, daycares, hospitals, churches and cemeteries. If the transmission line is in close proximity to human settlement areas, other features of these areas could also be impacted. For example, tree groves and wind breaks are frequently established to protect homes and other structures. Therefore, the potential for impacts to tree groves and wind breaks may be closely correlated with the proximity of the line to homes.

Displacement impacts are also dependent upon the proximity of the transmission line to homes. For electrical safety code and maintenance reasons, utilities would not generally allow residences or other buildings within the actual ROW easement for an HVTL.

Because of the close correlation between the extent to which particular route alternatives may impact human settlement and the proximity of the proposed route alternatives to homes and

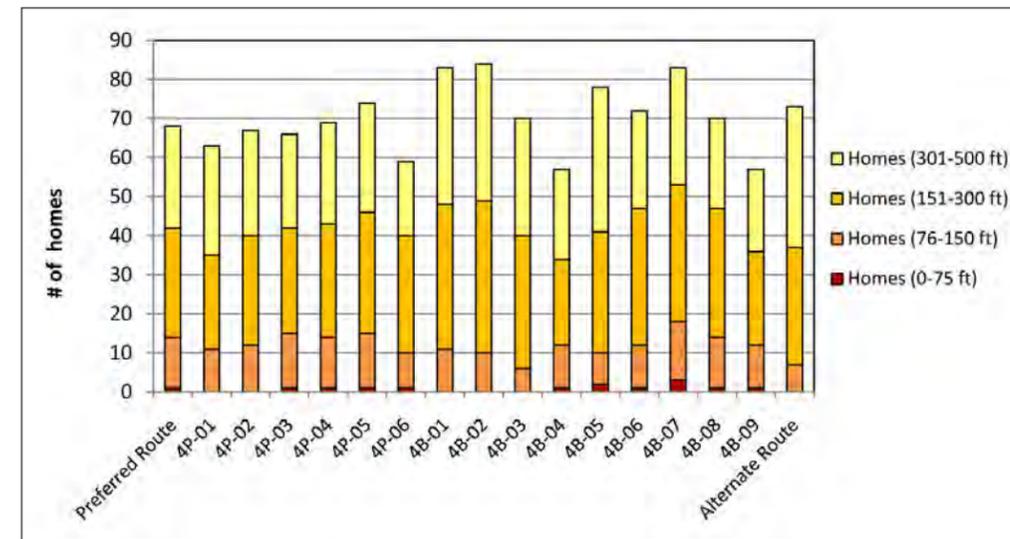
other human settlement features like schools, churches, cemeteries, nursing homes and hospitals, this impact summary focuses on the proximity of the proposed route alternatives to these features (shown in Maps 7.4-18E and 7.4-18W and Appendix A). For each alternative, pinch points, or narrow areas where human settlement impacts would be difficult to avoid, have also been identified (shown in Maps 7.4-18E and 7.4-18W and Appendix A).

Proximity to homes, schools, churches, cemeteries, nursing homes and hospitals for each of the proposed alternatives for the route segment from Cedar Mountain Substation to Helena Substation (shown in Maps 7.4-18E and 7.4-18W and Appendix A) is summarized in Figures 7.4.4.1-1 to 7.4.4.1-2.

Figure 7.4.4.1-1 compares the number of homes within 75 feet, 150 feet, 300 feet and 500 feet of the centerline of each route alternative in this segment.

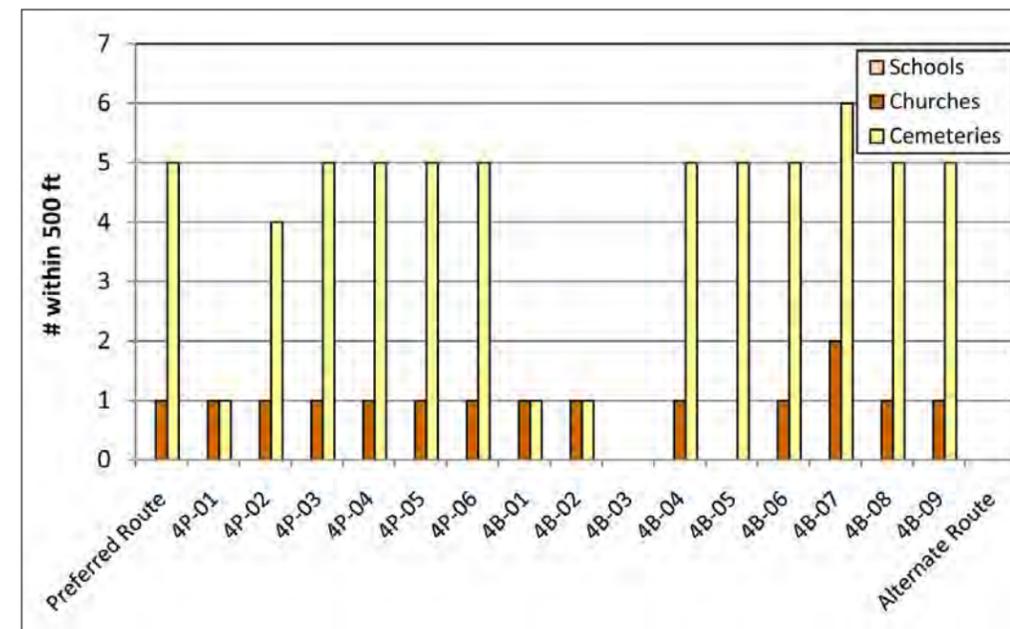
Due, in part, to the length of this route segment (approximately twice the length of any of the other segments evaluated) the number of houses within the 1,000-foot route width of the proposed routes centerlines is notably higher than for the three western-most route segments. All proposed route alternatives have greater than 57 houses within 500 feet of the proposed centerline. Proposed route alternative 4B-02 has the largest number of homes near the line with a total of 84 homes within 300 feet of the centerline. The Preferred Route and several of the proposed route alternatives, including 4P-03, 4P-04, 4P-06, 4P-05, 4P-06, 4B-04, 4B-06, 4B-08 and 4B-09, each have one house within the 150-foot ROW. This

Figure 7.4.4.1-1. Proximity of homes along each proposed route alternative



Source: Field survey observations, comments from project public meetings and aerial photograph interpretation by HDR. 12/29/08, updated by Barr 7/21/09

Figure 7.4.4.1-2. Proximity of other human settlement features along each proposed route alternative



Source: Schools: Minnesota Department of Education 09/18/2008 (Published by LMIC)

Churches and Cemeteries: Field survey observations, comments from project public meetings and aerial photograph interpretation by HDR. 12/29/08, updated by Barr 7/21/09

house appears to be an abandoned structure. This house and other structures associated with the house are within the proposed line right of way (ROW) and may need to be removed. Along route alternative 4B-05 there are two houses within the ROW and on route alternative 4B-07 three houses are within the ROW.

There are several narrow areas noted on the map (Map 7.4-18W) in the western portion of this route segment. The narrow area, just north of Minnesota River Crossing near the proposed South Cedar Mountain Substation, highlights the apparently abandoned home located within 75 feet of the proposed centerline. Two other narrow areas along the Preferred Route and several of the

Environmental Impacts

proposed variations on the Preferred Route occur where houses and trees are located close to the proposed alignment.

Along the Alternate Route and proposed route alternatives 4B-01, 4B-02 and 4B-03 there are three narrow areas that have been noted. In two cases these narrow areas occur where structures are located near the proposed line on one side of the road. The westernmost narrow area noted along these route alternatives represents a pinch point where a silo is located very close to the road on the east side and a house is located on the west side. In this case, aligning the route on either side of the road may require the removal of a structure.

Several narrow areas have also been noted in the eastern portion of this route segment (7.4-18E). Where the proposed line 4B-05 runs along U.S. Highway 169 south of Belle Plaine, two areas have been identified where additional evaluation may be needed to assess potential space constraints along the highway.

Figure 7.4.4.1-2 compares the number of schools, churches, and cemeteries for each of the proposed alternatives for this route segment. No nursing homes or hospitals are located within 500 feet of any proposed route centerline anywhere along this segment. The Alternate Route and proposed route alternative 4B-03 both have no churches or cemeteries within 500 feet of the centerline.

In this narrow area along the Preferred Route an alignment along the north side of the road is chosen this windbreak may be impacted.



Source: Barr photograph, 2009

A silo is located very close to the road on the east side and a house is located on the west side in westernmost narrow area noted along the Alternate Route and proposed route alternatives 4B-01, 4B-02 and 4B-03.

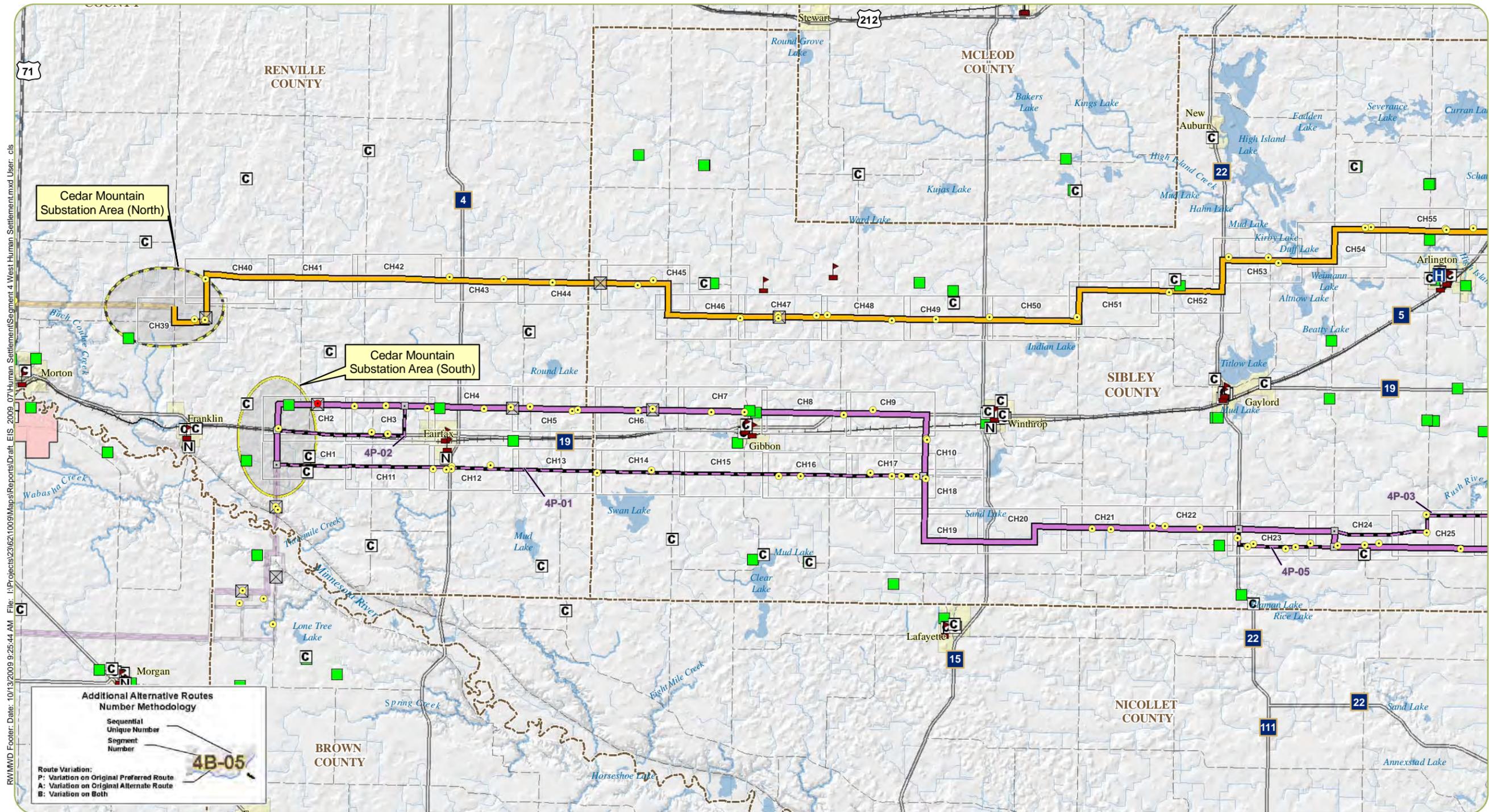


Source: Barr photograph, 2009

Mitigation

General mitigation measures to minimize impacts to human settlement are discussed in Section 6.1. Within this route segment, impacts to human settlement can be managed through choosing a route that minimizes the proximity of the line to homes as well as minimizing the total number of homes located within the Project route width. In this route segment, route alternatives 4P-06, 4B-04 and 4B-09 have fewest homes within the 1,000-foot route width, but each of these route alternatives has at least one house within 75 feet of the proposed centerline.

In the narrow areas noted in the western portion of this route segment, obstacles only exist on one side of the road and it may be possible to simply move (or keep) the line to the opposite side of the road. Mitigation of purely visual impacts at these locations would require undergrounding of the line or routing the line around or behind these homes. In the westernmost narrow area noted along route alternatives 4B-01, 4B-02 and 4B-03, and the Alternate Route mitigation may include compensation for structures that may have to be moved.



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SL1 Appendix A Map Index

0 1.5 3 6 Miles

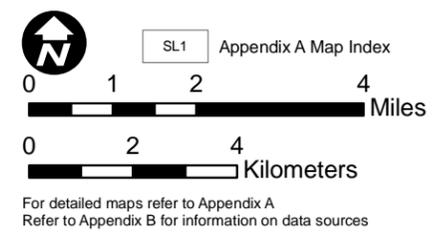
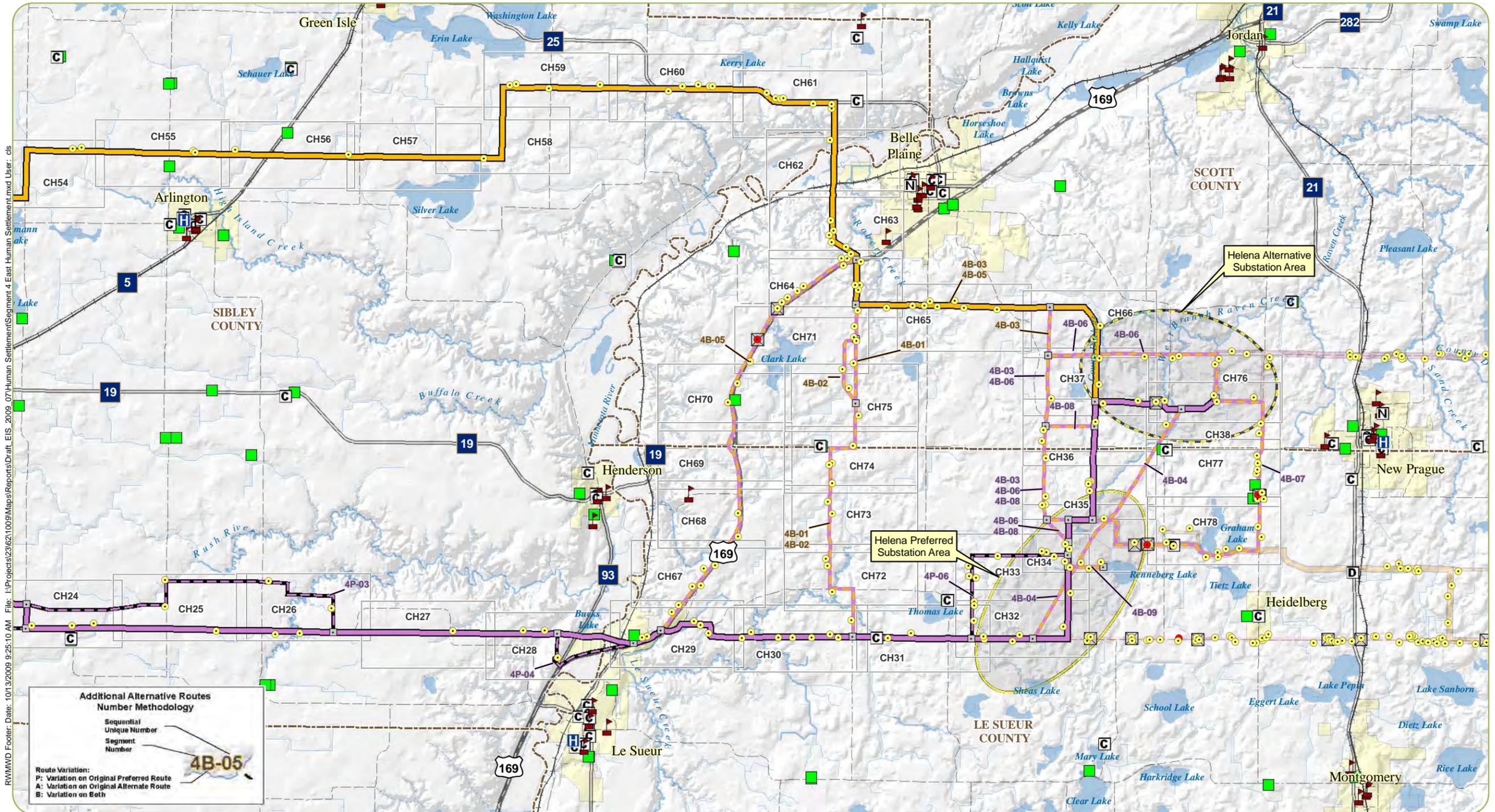
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For detailed maps refer to Appendix A
Refer to Appendix B for information on data sources

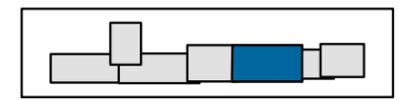
- | | | |
|-------------------------------|--|--------------------|
| Original Alignments | Project Substations | Hospitals |
| Preferred Route | Proposed Substation Areas | Nursing Homes |
| Alternate Route | Preferred | Observed Day Cares |
| Additional Alternative Routes | Alternate | Schools |
| Variation on Preferred Route | County Boundaries | Churches |
| Variation on Alternate Route | Residences within 75 Feet of Alternatives | Cemeteries |
| Variation on Both | Residences within 500 Feet of Alternatives | Tribal Land |
| | Narrows | |

Map 7.4-18W
Human Settlement Map
Segment 4 West, Cedar Mountain
Substation Area to Helena Substation Area

Source: Refer to Appendix B for information on data sources



Map 7.4-18E
Human Settlement Map
Segment 4 East, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

7.4.4.2 Public Health and Safety—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Public health and safety impacts associated with this Project are not anticipated. Any perceived risk of health impacts from electric and magnetic fields is likely to be correlated with the proximity of human dwellings to the proposed line. Information on the proximity of homes to each proposed route alternative within this route segment is provided in Section 7.4.4.1.

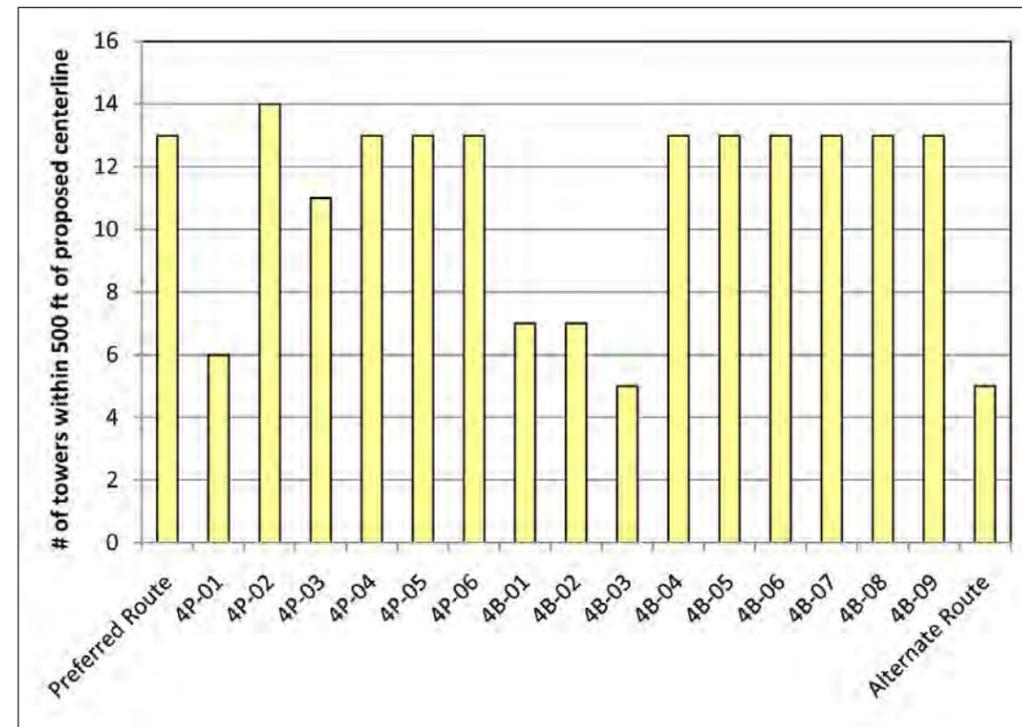
7.4.4.3 Air Quality—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Detailed discussion of potential air quality impacts are provided in Section 6.3. Potential air quality impacts are primarily associated with the production of small amounts of ozone and oxides of nitrogen in the air surrounding transmission line conductors and the potential release of small amounts of SF₆ during operation and maintenance of certain electrical substation equipment. These features do not vary notably between the proposed route alternatives in this segment. Thus, the nature of impacts to air quality is not expected to vary notably from one route alternative to the next. The operation of the proposed transmission line would not create any potential for the concentration of these pollutants to exceed existing air quality standards.

7.4.4.4 Interference—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

The nature of impacts related to interference, are not likely to vary notably between route segments or route alternatives. Impacts are expected to be greatest very close to the line for AM radio reception and very minor for all other types of reception. The placement of structures may also result in interference. Structure placement would be coordinated so as not interfere with microwave communication corridors.

Figure 7.4.4.4-1. Number of towers within 500 feet of proposed centerline for each proposed route alternative



Source: Federal Communications Commission. Data added by HDR based on public comments 12/29/08, updated by Barr September 2009

Figure 7.4.4.4-1 shows the number of communication towers within 500 feet of the proposed centerline for each route alternative in the Cedar Mountain Substation to Helena Substation segment.

7.4.4.5 Property Values—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Impacts to property values are a concern of many residents near existing or proposed transmission lines. Research assessing the relationship between property value and proximity to transmission lines suggests that the presence of a transmission line is one of several factors that interact to affect the value of a particular property. Since property value is influenced by many other factors that may vary widely from one property to the next and that may vary over time and across different regions, the results of current research is limited. Current studies have been unable to provide detailed quantitative assessments of how transmission lines may impact property values at the scale necessary to provide insight in comparing property value impacts across proposed route alternatives within this section or across this Project.

Section 6.5 provides an overview of potential impacts from interference and outlines general steps that would be taken to mitigate impacts from interference.

7.4.4.6 Historical and Archaeological Resources—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Within the Cedar Mountain Substation to Helena Substation segment, available SHPO records have been used to identify known archaeological resources, historical structures and historic landscapes within one-half mile on either side of the proposed centerline for each route alternative. In order to protect information about the specific location of certain resources that may be vulnerable to unauthorized removal of artifacts or other unauthorized disturbances, SHPO records only provide a township, range and section for certain resources. If any part of one of these identified areas is within one-half mile of a proposed route centerline, it has been assumed that the resource is potentially within the relevant area. Due to the uncertainty about the exact location of certain SHPO identified resources, total impacts have been characterized in terms of the total number of sites potentially within one-half mile of the route centerline.

Within the SHPO records, particular consideration is given to historical and archaeological resources listed on the National Park Service’s NRHP as these locations have been identified as critical national resources and are protected by the *National Historic Preservation Act of 1966*.

Potential historical and archaeological resource impacts for each of the proposed alternatives for the route segment from Cedar Mountain Substation to Helena Substation (shown in Maps 7.4-19W and 7.4-19E and Appendix A) are summarized in Figures 7.4.4.6-1 to 7.4.4.6-2.

Figure 7.4.4.6-1 compares the number of archaeological sites within one-half mile on either side of the proposed centerline for each route alternative in this segment. No NRHP registered archaeological sites are located within one-half mile of the centerline of any route alternative in this segment. None of the archaeological sites potentially located within one-half mile of the route centerline have been evaluated for eligibility for listing on the NRHP and thus, these sites have not been evaluated for significance. Across the proposed route alternatives, impacts vary from three to six sites potentially within one-half mile of the centerline. Route alternatives 4B-01, 4B-02, and 4B-03 have the fewest potential sites within one-half mile of the centerline.

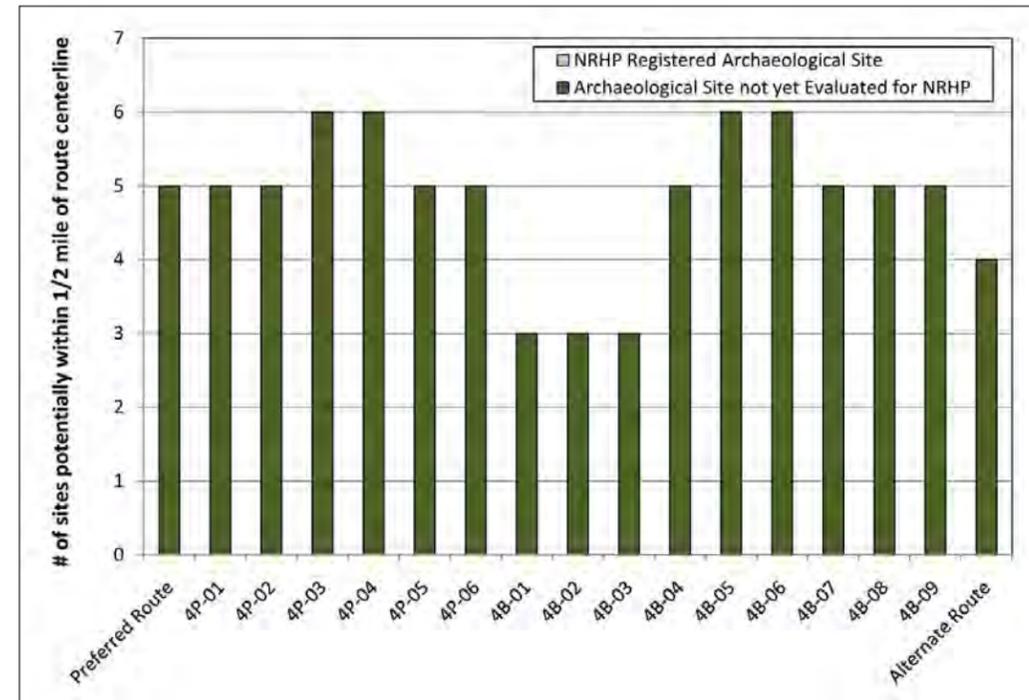
Figure 7.4.4.6-2 compares the number of historical architectural sites within one-half mile on either side of the proposed centerline for each route alternative in this segment. The German Evangelical Salem Church (site LE-TYR-007), is the single NRHP registered site located within one-half mile of the centerline of the majority of the proposed route alternatives. The only route

The German Evangelical Salem Church (site LE-TYR-007), is an NRHP registered site located within one-half mile of the Preferred Route and several other Proposed Route alternatives.



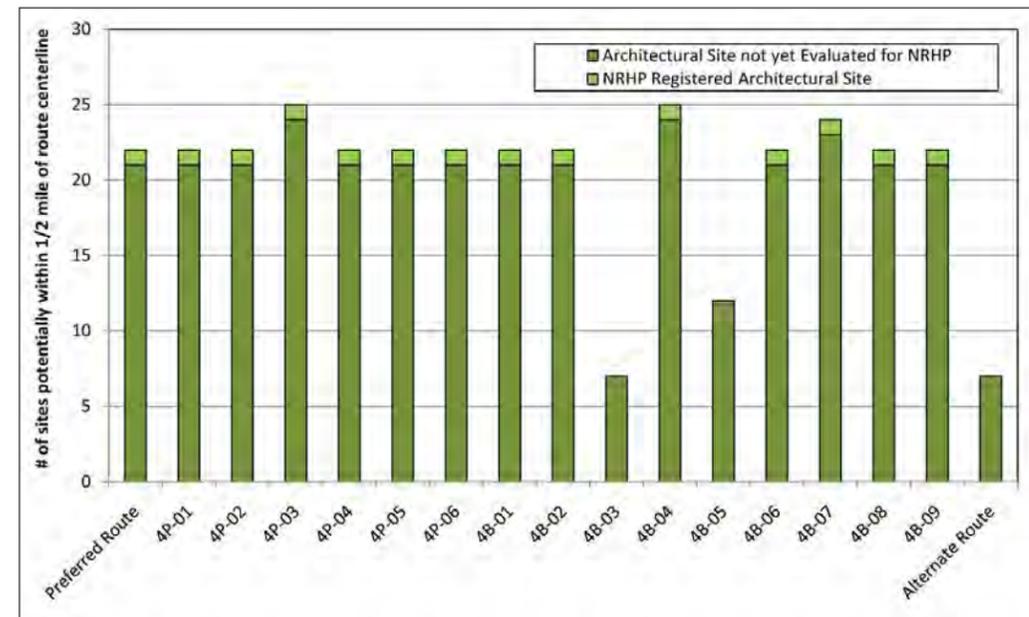
Source: Barr photograph, 2009

Figure 7.4.4.6-1. Number of archaeological sites along proposed route alternatives



Source: SHPO

Figure 7.4.4.6-2. Number of historical architectural sites along proposed route alternatives



Source: SHPO

alternatives that do not include this site within one-half mile of their centerlines are proposed route alternatives 4B-05, 4B-03, and the Alternate Route. Aside from the German Evangelical Salem Church, all other architectural sites potentially

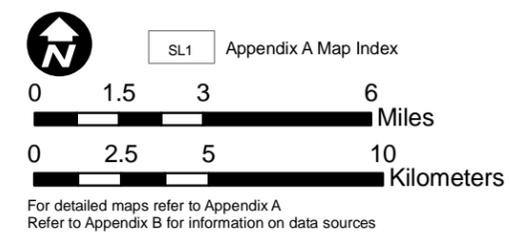
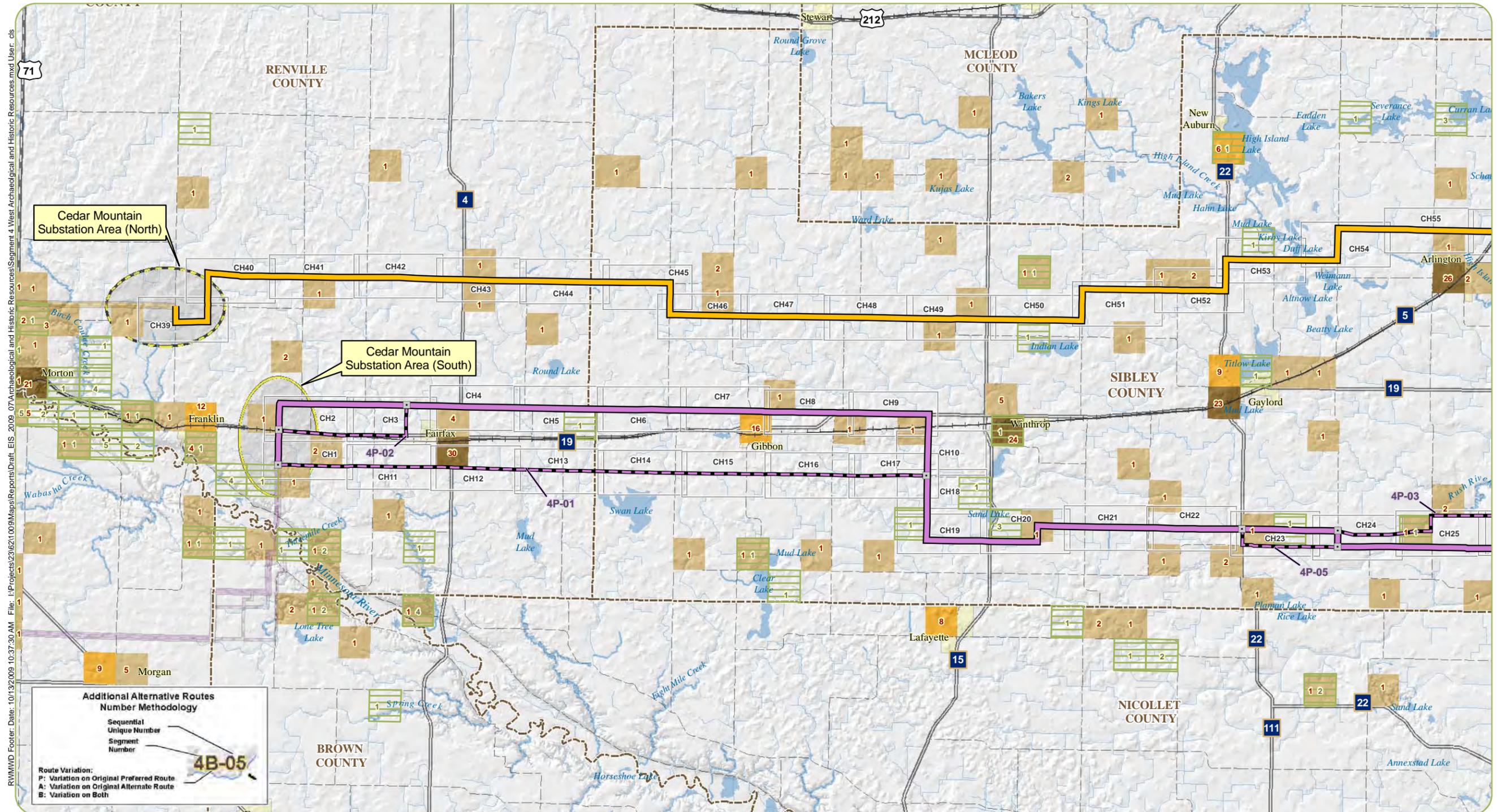
located within the one-half mile of the route centerlines have not been evaluated for eligibility for listing on the NRHP and thus, have not been evaluated for significance. Proposed route alternative 4B-03 and the Alternate Route have

the fewest potentially impacted archaeological resource areas, with 7 sites located within one-half mile of their centerlines.

Mitigation

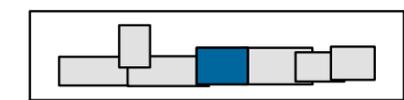
Project planning and engineering efforts would strive to avoid any sites within the proposed route width for each alternative. Route alternatives 4B-01, 4B-02 and 4B-03 have the fewest archaeological sites potentially within one-half mile of the route centerline. Route alternative 4B-03 and the Alternate route have the fewest historical architectural sites potentially within one-half mile of the route centerline. At this time it is not clear which route would have the fewest actual impacts on archaeological or historical resources or what the magnitude of the impacts since a complete assessment of all sites for NRHP status has not been completed. Specific mitigation plans cannot be made until a complete assessment of these sites has been made. For any resources within the route width, once the Project ROW is accessible, the applicants, as indicated in the RPA, would sponsor an archaeological investigation to locate these sites and provide a report to the OES and SHPO on the existing conditions, site management recommendations, and efforts, if known, to avoid, minimize, or treat impacts related to construction and maintenance of the Project. Planning specific mitigation measures Mitigation would entail compensating for the losses of properties that are eligible for listing on the NRHP. The applicants have also indicated that they may invite other parties (particularly Native American tribes and other state and federal permitting or land management agencies) to assist in the development of the avoidance, minimization, or treatment measures. Section 6.6 provides an overview of potential

impacts to archaeological and historical resources and outlines general steps that would be taken to mitigate impacts to these resources. Specific mitigation plans cannot be made until the steps described above have been completed.

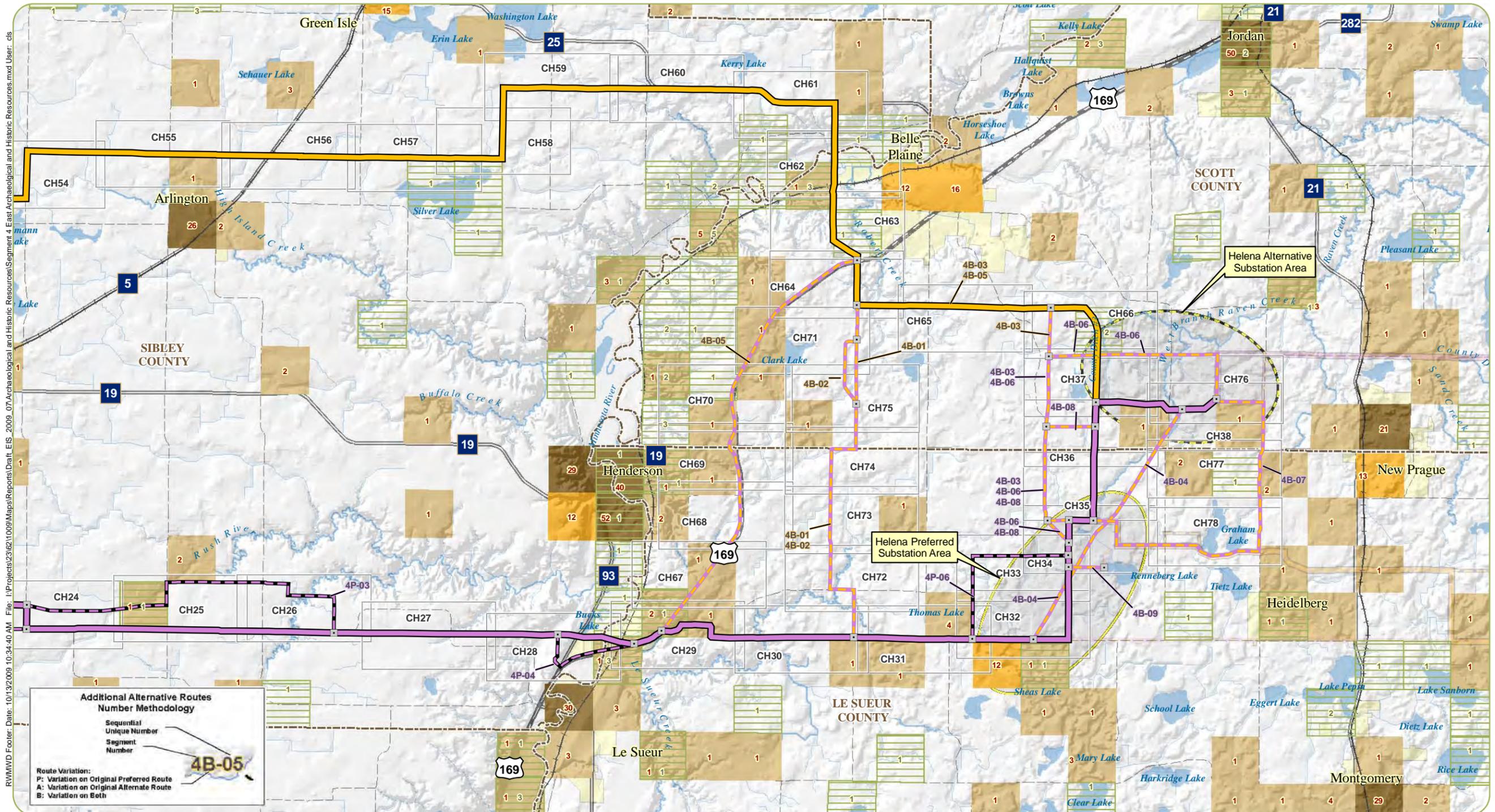


- Original Alignments
 - Preferred Route
 - Alternate Route
- Additional Alternative Routes
 - Variation on Preferred Route
 - Variation on Alternate Route
 - Variation on Both
- Project Substations
 - Proposed Substation Areas
 - Preferred
 - Alternate
- County Boundaries
 - County Boundaries
- Archaeological Sites
 - 1 - 5
 - 6 - 10
 - 11 - 15
- Historical Sites
 - 1 - 5
 - 6 - 20
 - >20

Map 7.4-19W
Archaeological & Historic Resources Map
Segment 4 West, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

4B-05

SL1 Appendix A Map Index

0 1 2 4 Miles

0 2 4 Kilometers

For detailed maps refer to Appendix A
Refer to Appendix B for information on data sources

Original Alignments

- Preferred Route
- Alternate Route

Additional Alternative Routes

- Variation on Preferred Route
- Variation on Alternate Route
- Variation on Both

Proposed Substation Areas

- Preferred
- Alternate
- County Boundaries

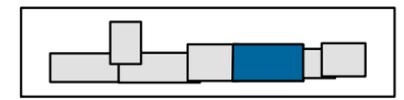
Archaeological Sites

- 1 - 5
- 6 - 10
- 11 - 15

Historical Sites

- 1 - 5
- 6 - 20
- >20

Map 7.4-19E
 Archaeological & Historic Resources Map
 Segment 4 East, Cedar Mountain
 Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

7.4.4.7 Land Use Compatibility—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

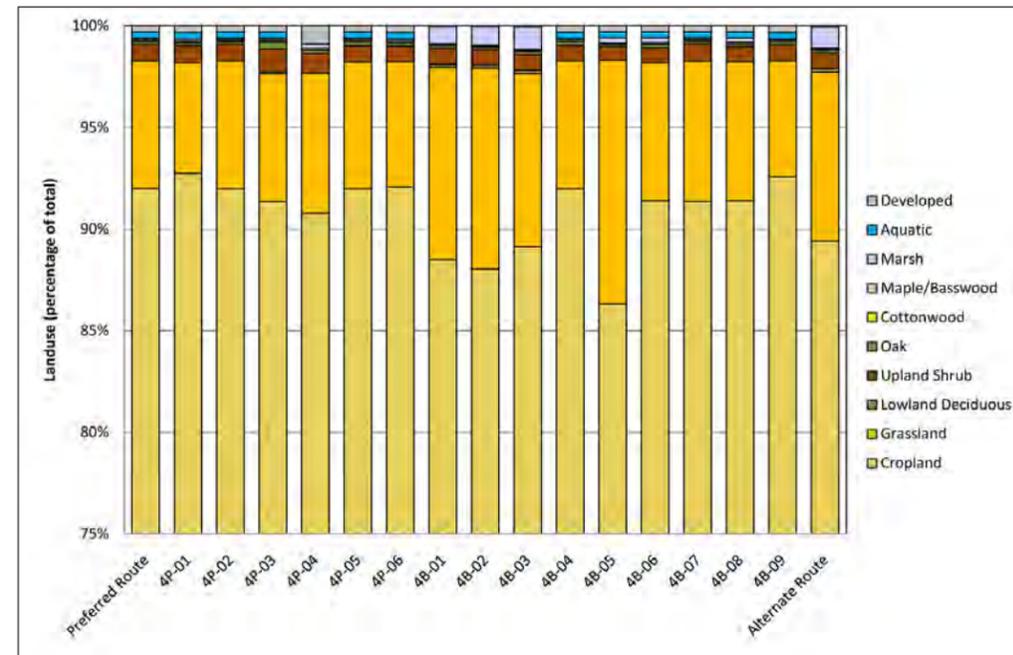
Impacts to current land use can be caused by activities associated with transmission line development. These impacts may range from temporary construction impacts to permanent impacts introduced where structure, substation, and line placement disturb current land uses or future land use plans. Current land use and zoning and available plans for future development have been evaluated in order to assess the compatibility of the proposed route alternatives with these land uses.

Current land cover types along the 150-foot right of way (ROW) for each route alternative in this route segment have been reviewed and are summarized in Figure 7.4.4.7-1.

The route alternatives in this segment are located on or adjacent to agricultural land in crop, pasture or grassland use. The Alternate Route passes through the O’Brian WMA in Scott County and is aligned adjacent to land guided for future residential development along 250th Street West in Belle Plaine. This land was annexed into Belle Plaine from Bell Plaine Township. The land is planned for low density single family residential development at densities of at least 3 units per acre.

The Preferred Route and proposed routes based on the Preferred Route cross the Minnesota River into Le Sueur County near the City of Se Sueur along the Le Sueur wastewater treatment ponds. These routes cross land zoned for industrial and commercial industrial uses. The area is currently used for light industrial and manufacturing purposes, land uses considered compatible with

Figure 7.4.4.7-1. Land cover types along each route alternative



Source: DNR, Department of Forestry 06/06/2002

HVTLS. The Mars Petcare U.S. company operates a pet food manufacturing facility immediately north of the TH 169 bridge over the river, and Cambria USA operates quartz countertop manufacturing facility TH 169. A small cluster of residences is located north of these industrial facilities on the northern side of Le Sueur. The majority of the proposed route alternatives that cross the Minnesota River near Le Sueur follow the TH 169 right of way for a short period before heading west out of the Le Sueur area into agricultural areas. Proposed route alternative 4B-05 continues along the TH 169 right of way and passes the residential cluster north of the industrial area.

Transmission lines may affect agricultural land use in this segment by the amount of land removed from productive use by the footprint of each tower. Tower placement may also affect the operation of irrigation equipment if present as well as crop spraying operations. Stray voltage and cattle may be a compatibility concern.

Single pole towers would be the primary tower type used for the Project and they use relatively little land compared to other tower types. Transmission towers and lines also change the visual quality of views within the agricultural landscape, however, due to the relatively low population densities and small numbers of travelers along most route alternatives, this potential impact would not affect many people. Impacts during tower construction may include the potential for destruction of crops within the grading/construction zoning and the compacting of soils by construction equipment and activities.

The major impact on residential areas, such as the residential area North of Le Sueur’s industrial area, may include changes to viewsheds for some properties and potential minor noise impacts during construction for properties in close proximity to the transmission line. Individual property values may be negatively affected depending on proximity to, and views of, the

transmission line. Impact on property values varies depending on a range of other factors including current market conditions, proximity, and access to open space, commercial services, and community services such as schools. Land used for tower siting may change or reduce the current and future functionality of the property depending on its size as well as its current and future use. The height of vegetation allowed within the proposed transmission line easement is generally limited to 25 feet which may conflict with the property owner’s desire for landscaping. Maintenance activities within the easement may pose temporary periodic conflicts with use and enjoyment of the property

The major impacts to commercial and industrial properties, such as the Industrial area along TH 169 near Le Sueur, are similar to those affecting residential areas. The compatibility of transmission lines with commercial and industrial uses is generally less of a concern with commercial property and even less so with industrial uses. Most commercial and industrial activities are located in close proximity to more heavily used road corridors and thus exposed to higher sound levels and affected viewsheds. Commercial activities may be more sensitive to impacts than industrial activities depending on the nature of commercial use. Parking and outdoor storage areas, typically a large portion of commercial and industrial land use, are not affected by transmission lines. Parking, vehicle circulation, and outdoor storage are generally allowed under transmission lines.

Mitigation

General measures to minimize impacts to Land Use Compatibility are discussed in Section 6.7. Within this route segment impacts to land use compatibility would be addressed primarily through BMPs to reduce impacts to agricultural areas during construction, operation, and maintenance.

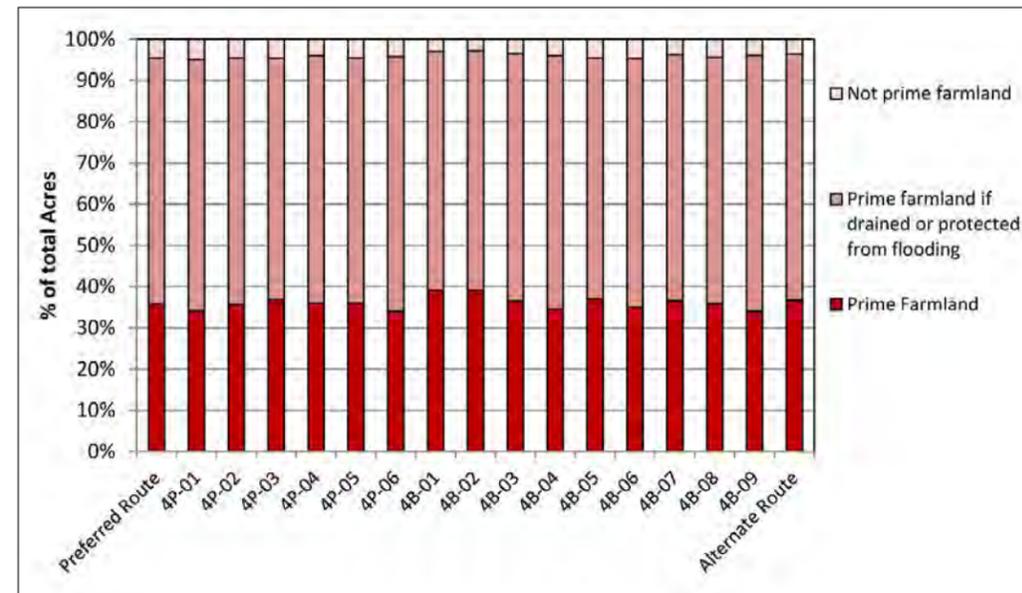
7.4.4.8 Land Based Economies—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

The primary land based economies along this route segment are agriculture based. Agricultural economies in the area may include livestock and dairy farms as well as bee-keeping. No mining or forestry operations are expected to be impacted by the Project.

The highest yield agricultural activities include cultivation of corn, soybeans and oats as well as raising cattle. Much of the agricultural land is designated as “prime farmland,” indicating land that this land is most desirable for agricultural production. The Project would result in permanent and temporary impacts to farmland. Permanent impacts would occur as a result of structure placement along the route centerline. It is estimated that the permanent impacts in agricultural fields would be 1,000 square feet per pole. During construction, temporary impacts, such as soil compaction and crop damage within the ROW, are possible. Temporary impacts in agricultural fields are estimated to be one acre per pole for construction activities.

Figure 7.4.4.8-1 shows the amount of prime farmland within the ROW of each of the proposed route alternatives in this segment.

Figure 7.4.4.8-1. Farmland and non-farmland within ROW of proposed route alternatives



Source: U.S. Department of Agriculture, Natural Resources Conservation Service

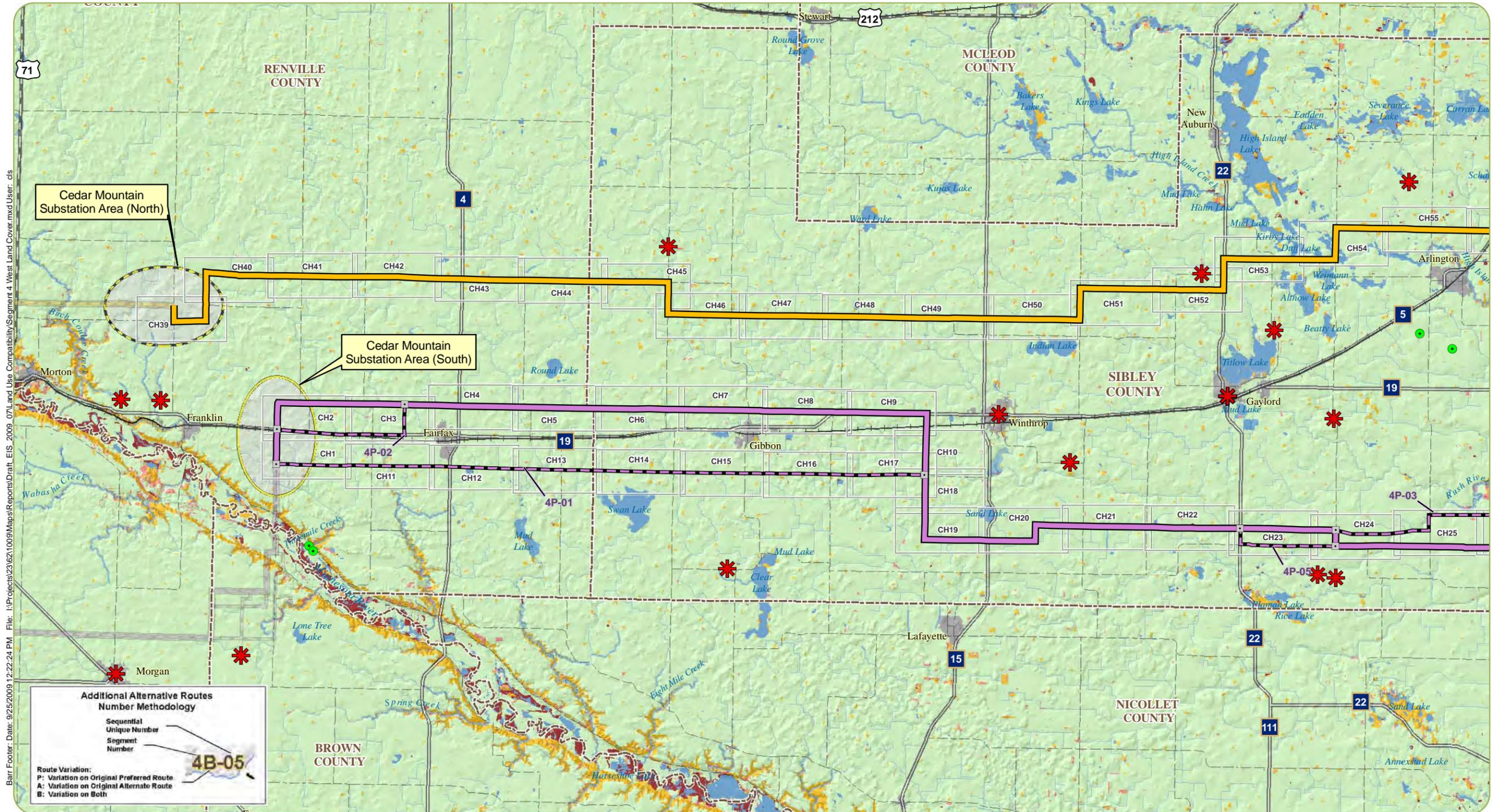
The percentage of prime farmland within the ROW does not change notably from one proposed route alternative to the next along this route segment.

The locations of organic farms are shown in Maps 7.4-20W and 7.4-20E and Appendix A. While certain proposed route alternatives are in closer proximity to organic farms than other proposed route alternatives, it is expected that the implementation of mitigative measures described below would prevent impacts to organic farm status.

Mitigation

While the presence of an HVTL near an organic agricultural area does not directly impact organic status, special procedures must be followed during the construction and maintenance activities associated with HVTLs to avoid impacts to organic farms. The applicant has worked with the MDA to develop an AIMP for this Project. The overall objective of this AIMP is to identify measures the Utilities would take to avoid,

mitigate, repair and/or provide compensation for impacts that may result from transmission line construction projects on agricultural land in Minnesota. The AIMP includes an appendix that outlines mitigation measures and procedures specific to construction and maintenance procedures near Organic Agricultural Land as described in the National Organic Program Rules, 7 CFR Parts 205.100, 205.202, and 205.101. By following the procedures outlined in the AIMP, impacts to Agricultural land based economies due to construction and maintenance of the line can be eliminated or mitigated.



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

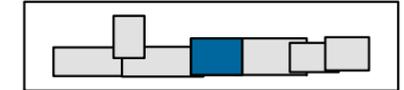
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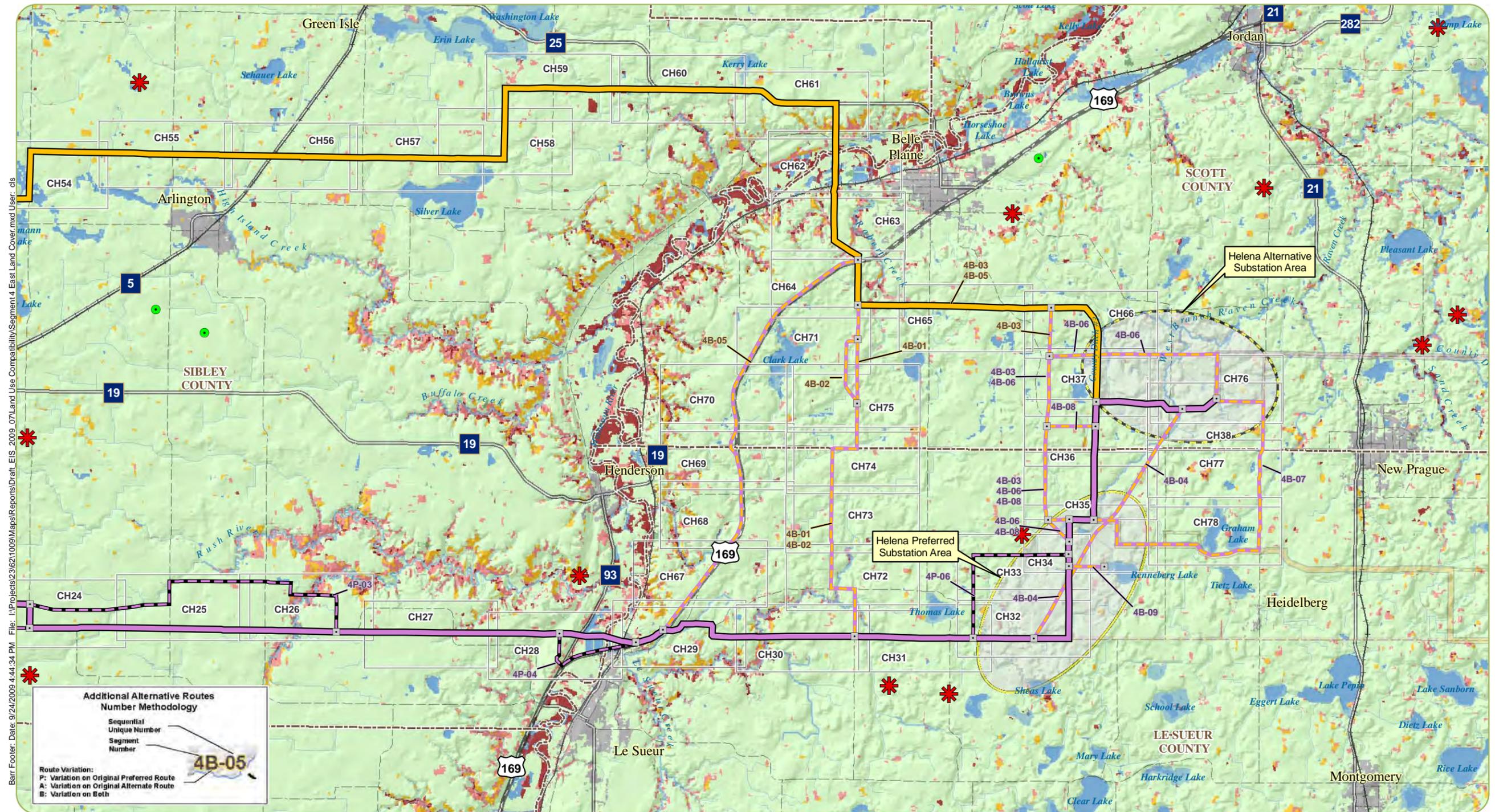
For detailed maps refer to Appendix A
 Refer to Appendix B for information on data sources

Original Alignments	Project Substations	Land Cover	Upland Conifer-Deciduous mix
Preferred Route	Proposed Substation Areas	Upland Conifer Forest	Aquatic Environments
Alternate Route	Preferred	Upland Deciduous Forest	Crop/Grass
Additional Alternative Routes	Alternate	Lowland Deciduous Forest	Non-Vegetated
Variation on Preferred Route	County Boundaries	Lowland Conifer Forest	Shrubland
Variation on Alternate Route	Organic Farms		
Variation on Both	Center Pivot Irrigation		

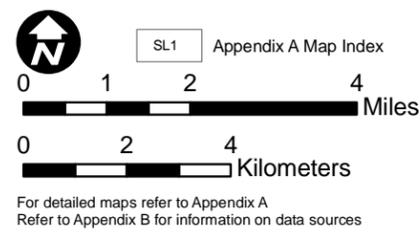
Map 7.4-20W
 Land Use Compatibility Map
 Segment 4 West, Cedar Mountain
 Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

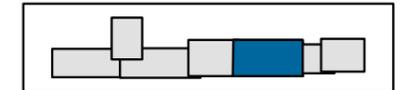


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- | | | | |
|---|---|---|---|
| <p>Original Alignments</p> <ul style="list-style-type: none"> Preferred Route Alternate Route <p>Additional Alternative Routes</p> <ul style="list-style-type: none"> Variation on Preferred Route Variation on Alternate Route Variation on Both | <p>Proposed Substation Areas</p> <ul style="list-style-type: none"> Preferred Alternate County Boundaries Minnesota State Line Organic Farms Center Pivot Irrigation | <p>Land Cover</p> <ul style="list-style-type: none"> Upland Conifer Forest Upland Deciduous Forest Lowland Deciduous Forest Lowland Conifer Forest | <ul style="list-style-type: none"> Upland Conifer-Deciduous mix Aquatic Environments Crop/Grass Non-Vegetated Shrubland |
|---|---|---|---|

Map 7.4-20E
Land Use Compatibility Map
Segment 4 East, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

**7.4.4.9 Transportation and Public Services—
Analysis of Segment Alternatives for the
Cedar Mountain Substation to Helena
Substation**

**Roadways, Railroads and Emergency
Services**

The nature of impacts to roadways, railroads and emergency services are not expected to vary notably from one route segment to the next or from one route alternative to the next. Impacts are expected to be limited to temporary impacts along roads and railroad corridors due to construction and maintenance of the line. Section 6.9 provides an overview of potential impacts to transportation and emergency services.

Rest Areas

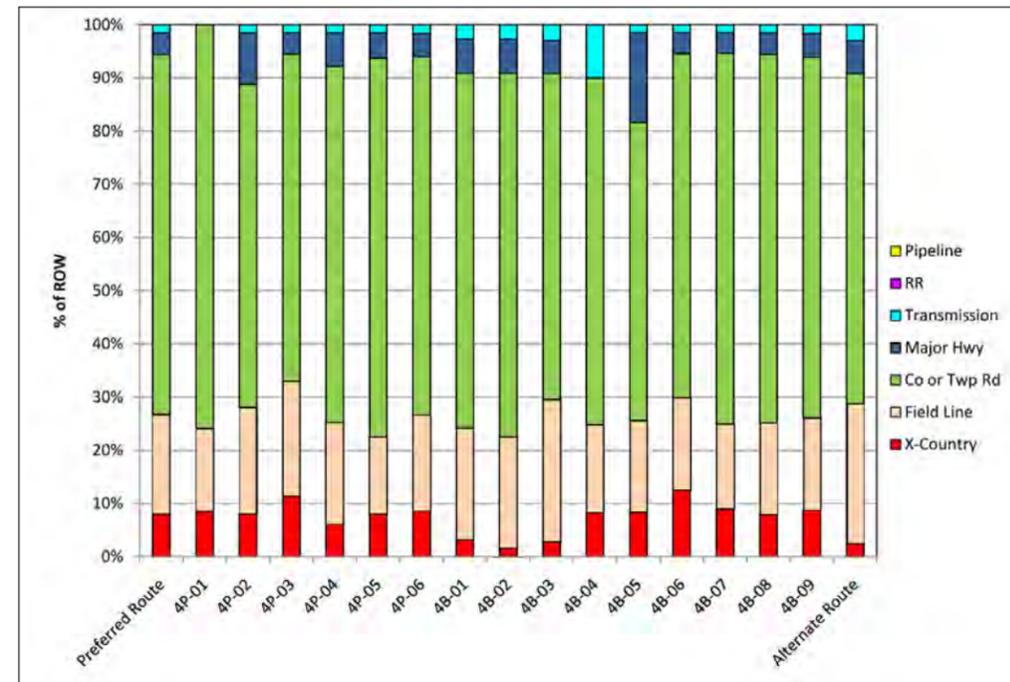
All of the proposed route alternatives except 4B-01, 4B-02, 4B-03 and the Alternate Route would pass within 500 feet of the Minnesota River Valley Safety Rest Area located on US 169. The rest area is located one mile north of Le Sueur and shown on Map 7.4-21E. It is DOT’s concern that the proposed routes would cause a significant impact to scenic views from the rest area. The proposed lines would occur between the rest area and the scenic view in the primary viewshed from the rest area lobby. Also, pruning and removal of existing mature woodland vegetation required in the transmission blowout area would cause significant negative impacts to the rest area.

Airports and Landing Strips

Potential impacts to airports and landing strips are expected to vary by route depending on the proximity of the line to the airport and the particular characteristics of the airport in question. Maps 7.4-21W and 7.4-21E show the location of airports along this section of the route

Consideration was given to a number of airports, including unregistered airports, Minnesota Valley Health, Le Sueur Municipal Airport,

Figure 7.4.4.9-1. Shared ROW types along each route alternative



Source: Field survey observations, comments from project public meetings and aerial photograph interpretation by HDR. 12/29/08, updated by Barr 9/01/09

ARS Sport Strip, Son’s Private Commercial, and Merrill Harris Field, all of which appear to be outside the area of concern for the proposed route alternatives.

Nagel & Schultz is a private, non-public use airport located approximately 1.5 miles southwest of Belle Plaine and is within one-half mile of all proposed route alternatives. The facility has two runways. Runway (08/26) is a turf runway measuring 2,000 by 50 feet that is aligned west to east and runway (17/35) is a turf runway measuring 1,450 by 50 feet that is aligned north to south. There are 2 single engine aircraft based at this facility. The proposed route alternatives 4B-01 and 4B-02 would be located 106 feet from the end of the runway and would likely require the abandonment of the runway.

Another unnamed airstrip in this area is located within one-half mile of all variations on the Preferred Route and proposed route alternatives 4B-04 through 4B-09. Details regarding runway

length and approach slope for this airstrip were not available.

Right of Way Sharing

Sharing ROW with existing infrastructure can minimize the ROW needed for the transmission line, minimizing impacts to adjacent property. In Maps 7.4-21W and 7.4-21E, areas where the ROW for the proposed route alternatives would share existing transportation, transmission line or pipeline infrastructure have been identified.

Figure 7.4.4.9-1 shows the percentage of total line distance where ROW is shared with existing infrastructure under each route alternative in this segment. Areas where proposed routes follow field lines (survey lines, natural division lines and agricultural field boundaries), or cut cross-country through fields, pastures, and forests have been highlighted. In these areas there is no opportunity to minimize impacts to property by sharing existing ROW area.

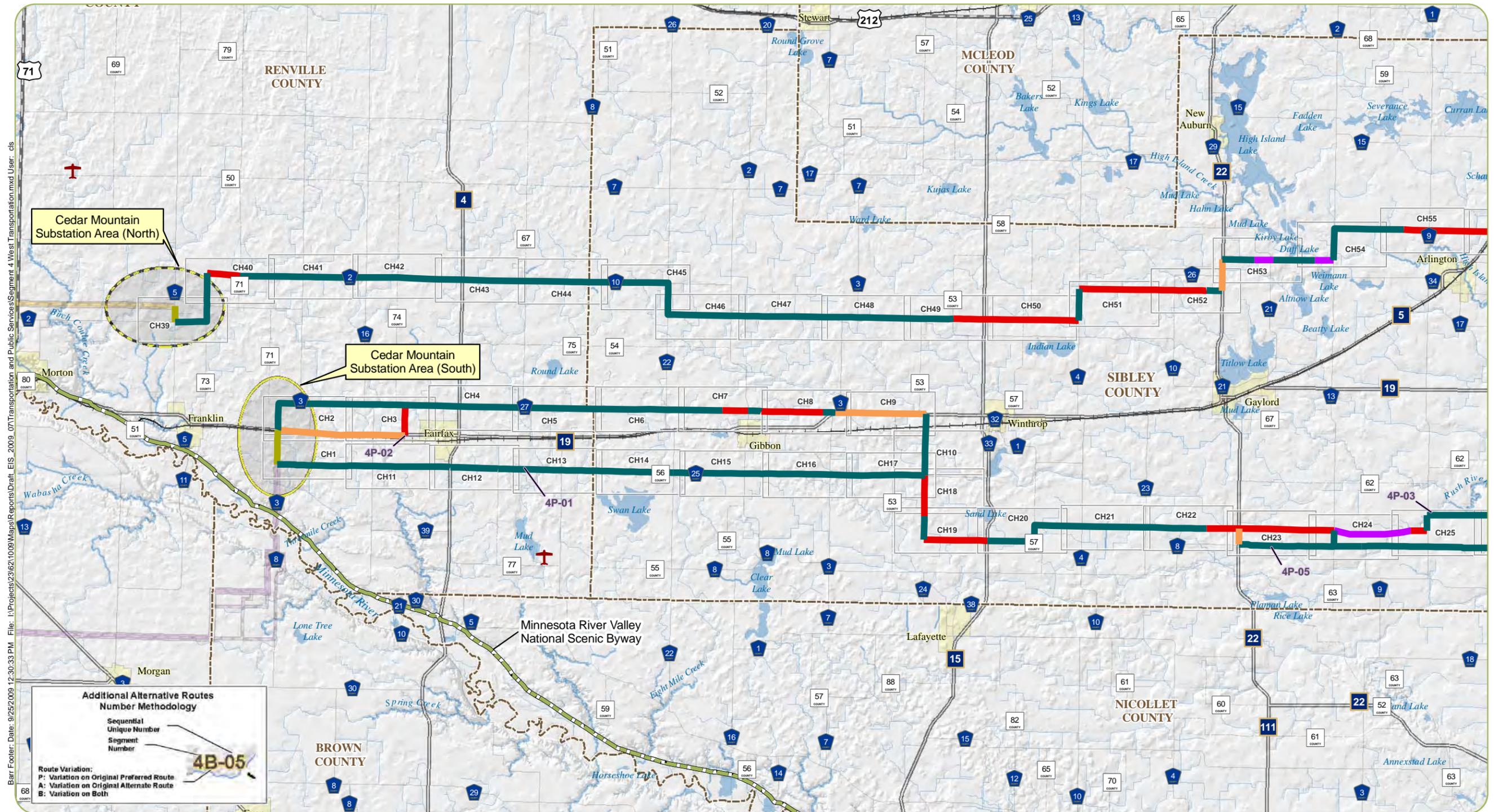
All of the proposed route alternatives in this segment share approximately 25-35 percent of their ROW with existing infrastructure. Most of the shared ROW occurs along county or township roads and the majority of the unshared ROW follows field lines.

Mitigation

General mitigation measures to minimize impacts to Transportation and Public Services are discussed in Section 6.9. Within this route impacts to transportation are expected to be limited to airports and one rest area. The main airport within this route segment where potential impacts exist is Nagel and Shultz private airport. The proposed route alternatives 4B-01 and 4B-02 would be located 106 feet from the end of the runway and would likely require the abandonment of the runway. Mitigation, in this case, is limited to choosing a route that is not located in such close proximity to this airport

The single rest area within this route segment is the Minnesota River Valley Safety Rest Area located on US 169. Mitigation within this area includes selective pole placement to limit the need for tree removal/pruning. Using the greatest span between poles as possible would also limit the number a poles that would impact the viewshed. There are also four proposed route alternatives (4B-01, 4B-02, 4B-03 and the Alternate Route) that do not encroach upon the rest area and would cause no impact.

It should also be noted that by choosing routes that maximize the amount of shared ROW with existing roads, transmission lines, pipeline, or railroad can mitigate impacts to surrounding land. Within this segment route alternative 4P-05 has the greatest amount of shared ROW.



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

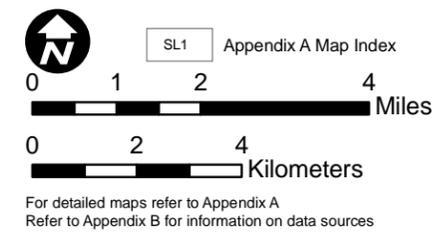
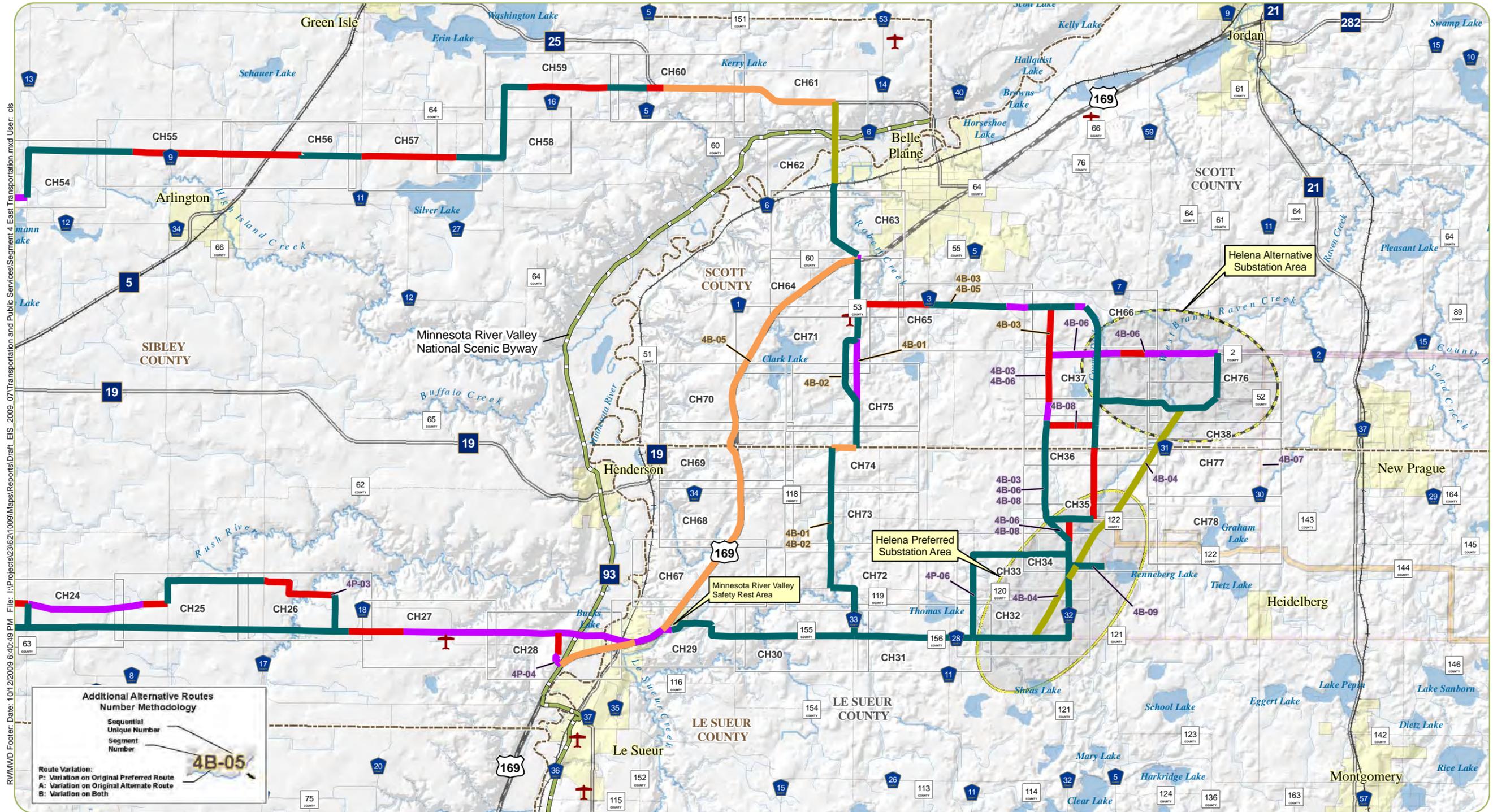
For detailed maps refer to Appendix A
 Refer to Appendix B for information on data sources

Project Substations	Pipeline	Non-ROW Sharing Field Line
Preferred	County or Township Road	Non-ROW Sharing Cross-Country
Alternate	Major Highway	
County Boundaries	Municipal Street	
Airport	Railroad	
Scenic Byway	Transmission	

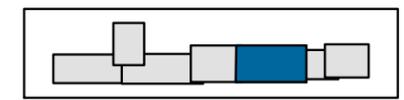
Map 7.4-21W
 Transportation Map
 Segment 4 West, Cedar Mountain
 Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources



Map 7.4-21E
Transportation Map
Segment 4 East, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

7.4.4.10 Recreation—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

The proposed Project has the potential to impact recreational resources in areas where pole placement may result in temporary construction related disturbances or even permanent impacts. In some areas, viewshed impacts from the transmission line may affect recreators. In order to capture the range of potential impacts to recreation in the region, recreational features within various distances of the line have been evaluated.

Within this segment, no impacts to SNAs and state and federal parks are expected. SNAs and state and federal parks are beyond the range where any direct impacts may occur and all of these features are outside the range where viewshed effects are possible.

The Minnesota River Valley National Scenic Byway runs from Browns Valley to Belle Plaine and is primarily used as a visual source of recreation to view the scenery of the River Valley. The Byway takes travelers along 287 miles of the Minnesota River Valley through hardwood forests, prairie grasses, 3.8 billion year old granite outcrops, agriculture, state and local parks and historic sites. All proposed route alternatives within this segment cross the Minnesota River Valley National Scenic Byway and have the potential to cause visual impacts in this area.

At the Minnesota River crossing in northern Le Sueur County, the land area is a mixture of rolling agricultural lands and some forest area, which contribute to the scenic nature of the landscape. The river valley and bluff lines along the river

dominate the viewshed, creating an area of high scenic value for recreational users and residents.

Potential recreational resource impacts for each of the proposed alternatives for the route segment from Cedar Mountain Substation to Helena Substation (shown in Maps 7.4-22W and 7.4-22E and Appendix A) are summarized in Figures 7.4.4.10-1 to 7.4.4.10-3.

Figure 7.4.4.10-1 compares the proximity to WMAs under each route alternative in this segment. WMAs play a large role in Minnesota’s outdoor recreation system as they offer opportunities for hunting.

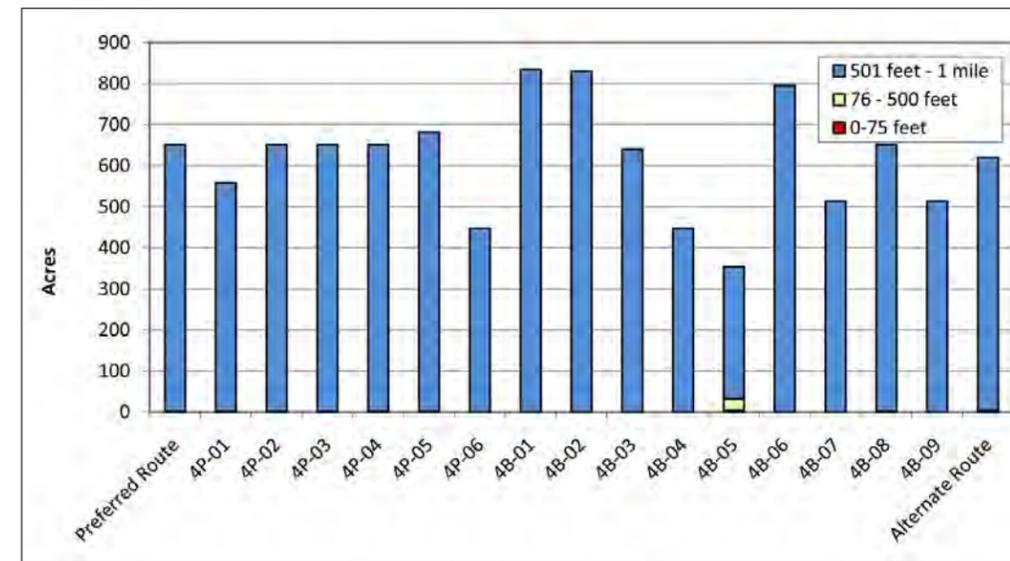
Impacts to WMAs under the various route alternatives are discussed further in Section 7.4.4.12.

Figure 7.4.4.10-2 compares the proximity to a variety of recreational resources including local parks and recreation areas and areas used for sporting activities under each route alternative in this segment.

Within this segment only one route alternative encounters a park within 500 feet of the route centerline. All other route alternatives have one or no parks within one-half mile of the route centerline, with the exception of route alternative 4B-04 which has two parks within one-half mile of its proposed centerline. No other recreational areas or sporting areas are expected to be impacted.

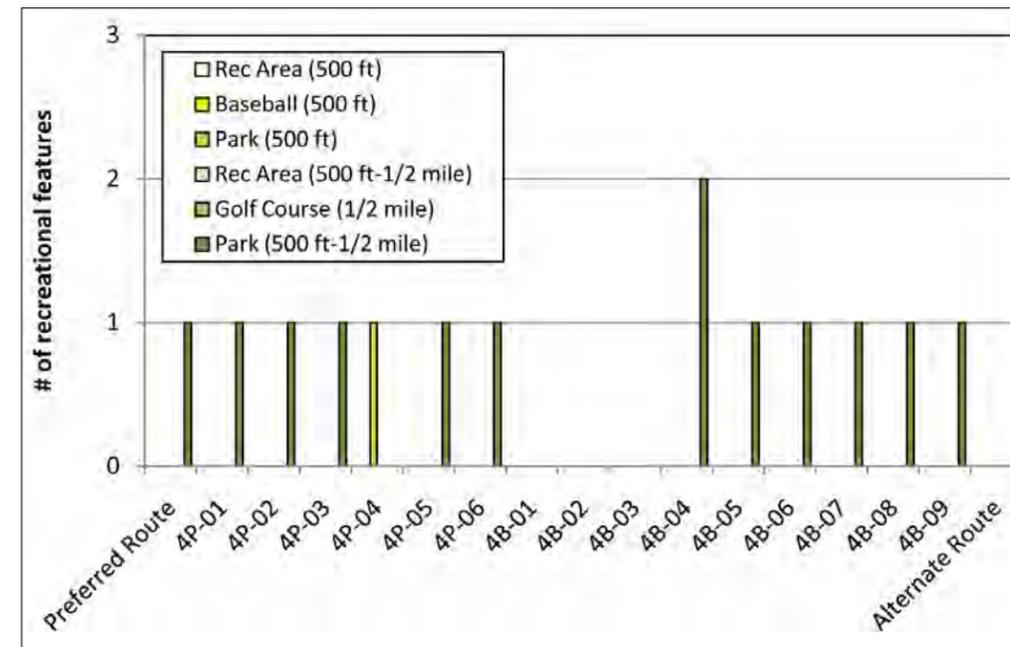
Minnesota’s state, county and local trail systems offer recreational opportunities ranging from snowmobiling to cycling. Figure 7.4.4.10-3 compares potential snowmobile trail impacts

Figure 7.4.4.10-1. WMAs along each route alternative



Source: DNR, Division of Fish and Wildlife 02/14/2006

Figure 7.4.4.10-2. Recreational resource areas along each route alternative



Source: Field survey observations, comments from project public meetings and aerial photograph interpretation by HDR. 12/29/08

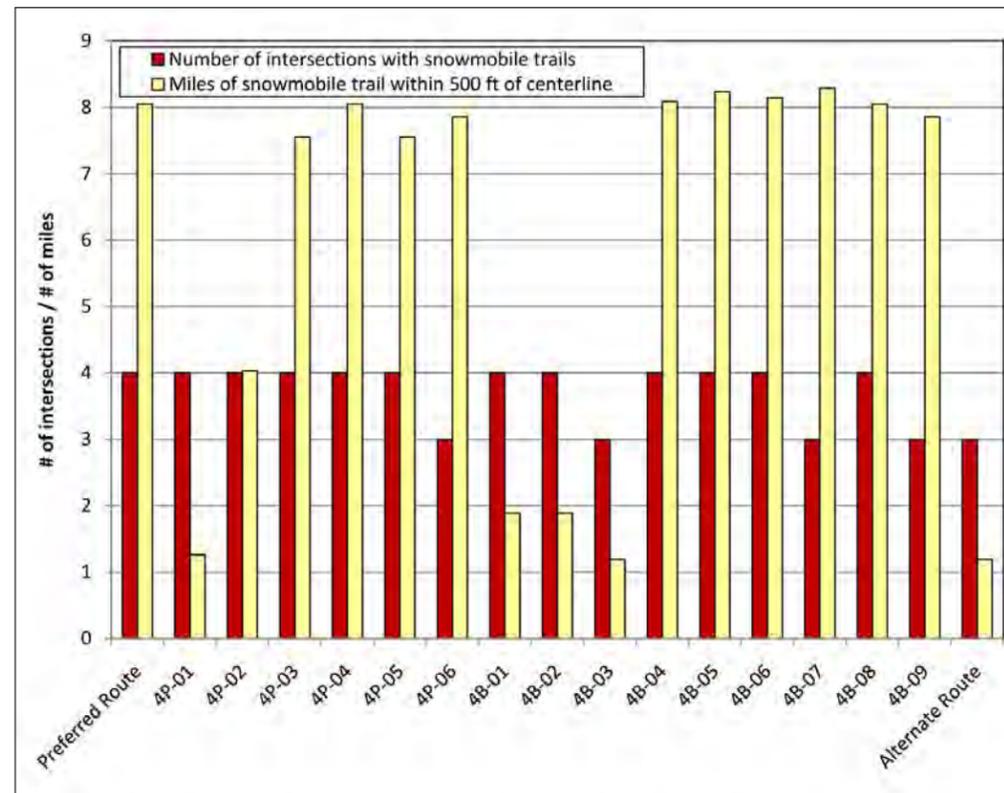
across the various route alternatives in this route segment. Project impacts to trail systems may range from temporary construction impacts on trails immediately adjacent to the line to visual impacts for recreators in areas where the line is visible from the trail.

Impacts to snowmobile trails in terms of total trail crossings are roughly similar across all proposed route alternatives in this segment. Several route alternatives including 4P-01, 4B-03, and the Alternate Route have significantly fewer miles of trail within 500 feet of the proposed centerline.

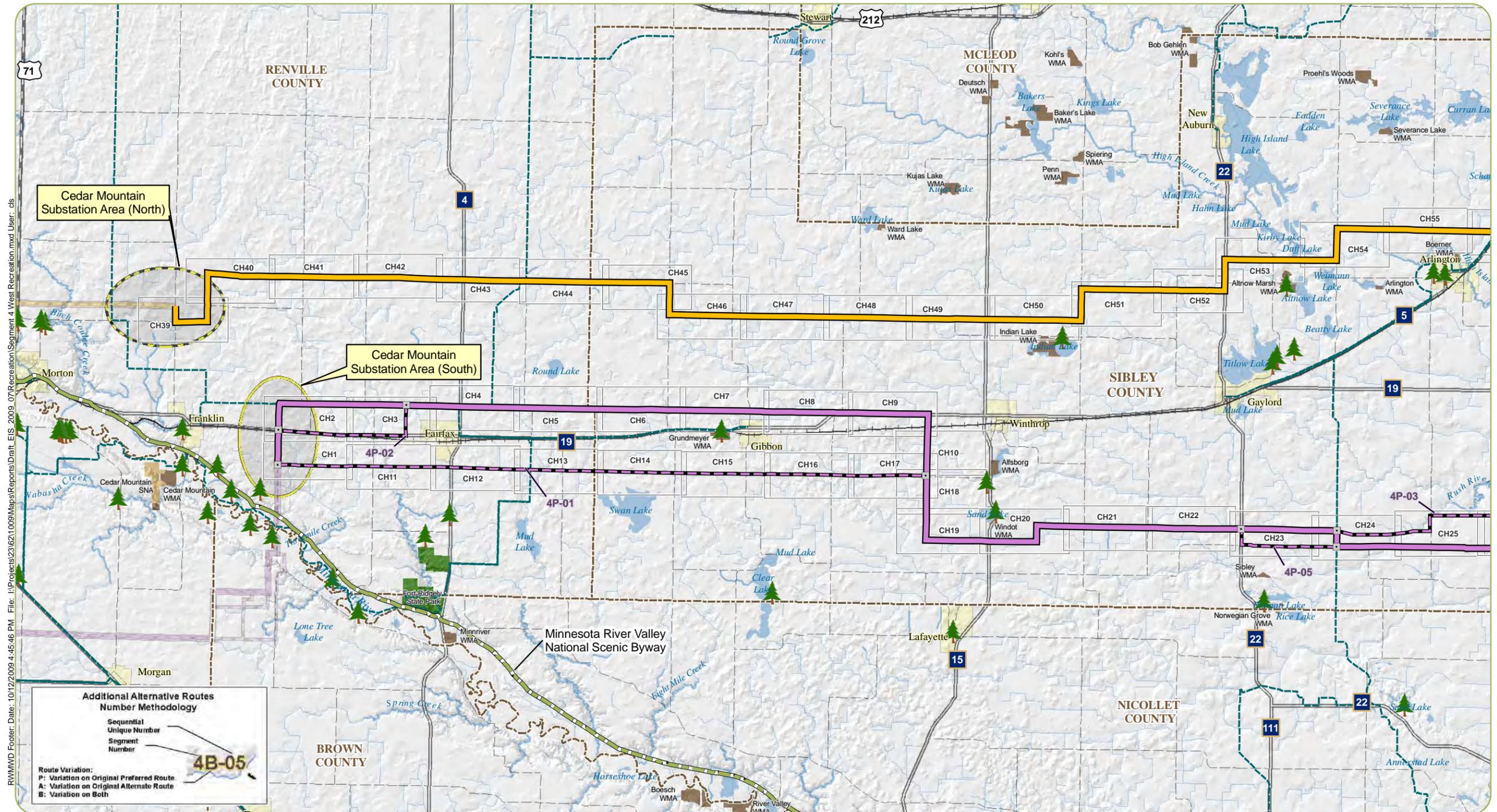
Mitigation

General mitigation measures to minimize impacts to recreation are discussed in Section 6.10. Because the impacts to recreational areas are primarily visual, impacts to recreational resources can be managed through choosing a route that minimizes the proximity of the line to recreational resources. Each proposed route impacts different recreational resources to a different degree, so minimizing impacts to certain resources may involve a tradeoff that results in greater impacts to other recreational resources. Within this route segment, Route alternative 4B-05 has the fewest WMA areas within the route width, but the most WMA areas within 500 feet of the line. It should be noted that for WMAs that are directly adjacent to the proposed routes, placing poles so that they span WMA areas can help to reduce temporary and permanent impacts related to construction and pole placement. Route alternatives 4B-01, 4B-02, and 4B-03 have no apparent impacts to parks and sporting areas and route 4B-03 has the fewest impacts to snowmobile trails. Additionally, it should be noted that for WMAs that are directly adjacent to the proposed route alternatives, placing poles so that they span WMA areas can help to reduce temporary and permanent impacts related to construction and pole placement.

Figure 7.4.4.10-3. Snowmobile trails along each route alternative



Source: DNR, Division of Trails and Waterways 06/01/2003



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

0 1.5 3 6 Miles

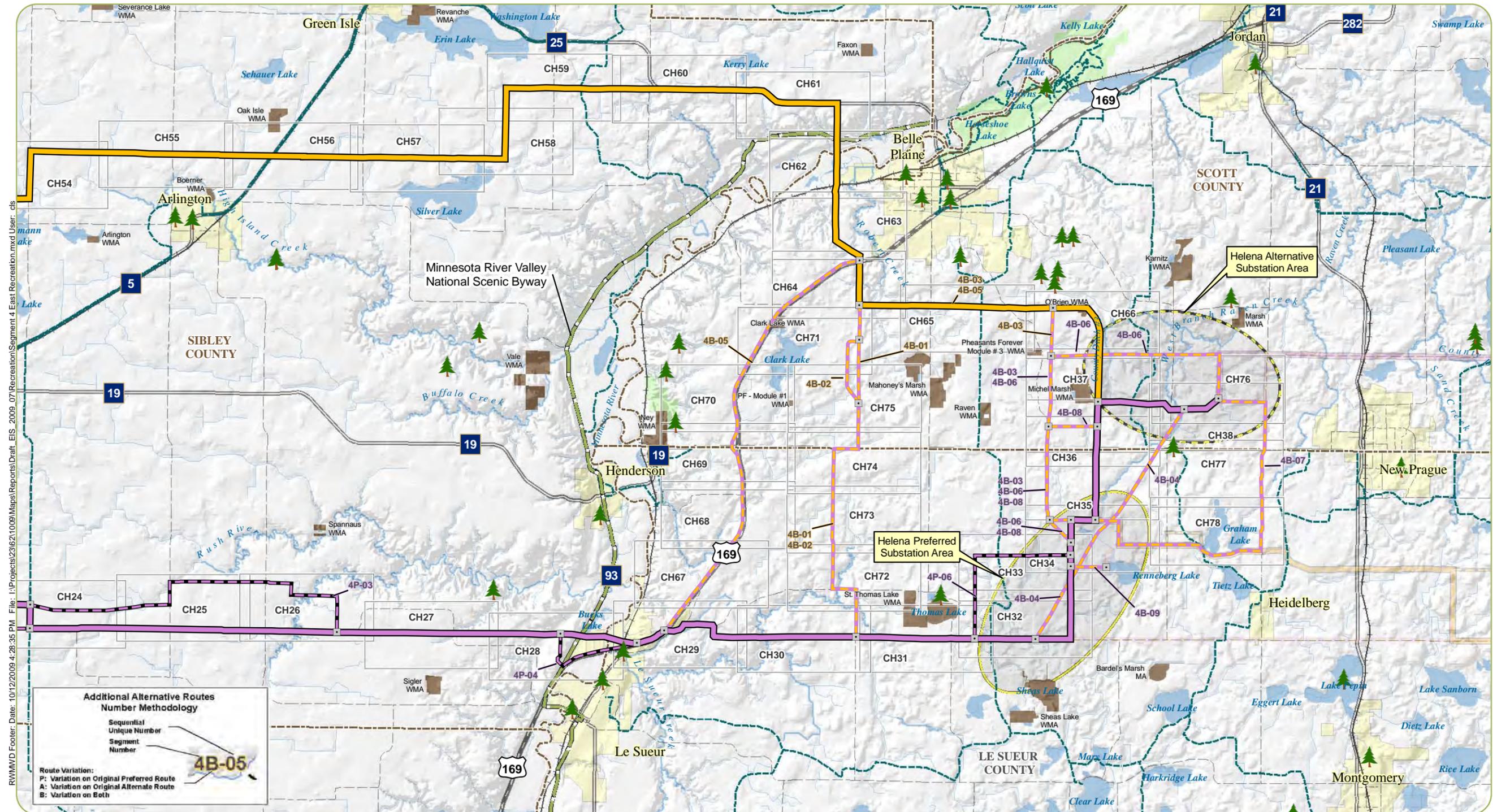
0 2.5 5 10 Kilometers

For detailed maps refer to Appendix A
 Refer to Appendix B for information on data sources

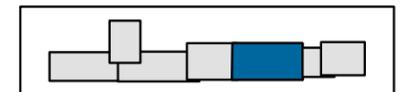
Original Alignments	Project Substations	Regional Existing Trail	Regional Park
Preferred Route	Proposed Substation Areas	Regional Planned Trail	Scientific and Natural Area
Alternate Route	Preferred	Regional Proposed Trail	State Park
Additional Alternative Routes	Alternate	State Existing Trail	State Recreation Area
Variation on Preferred Route	County Boundaries	Snowmobile Trail	State Wayside
Variation on Alternate Route	Recreation Area	Scenic Byway	Wildlife Management Area
Variation on Both			Wildlife Refuge

Map 7.4-22W
 Recreation Map
 Segment 4 West, Cedar Mountain
 Substation Area to Helena Substation Area

Source: Refer to Appendix B for information on data sources



Map 7.4-22E
Recreation Map
Segment 4 East, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

7.4.4.11 Water Resources—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

A variety of data sources (see Appendix B) were used to identify water resources within the 150-foot ROW and 1,000-foot route width of each route alternative within the Cedar Mountain Substation to Helena Substation segment. Maps 7.4-23E and 7.4-23W and Appendix A identify the water resources within the vicinity of each route alternative; see Maps 7.4-24E 7.4-24W for wetlands present beyond the 150-foot ROW of each route alternative. Several rivers, streams, and ditches (collectively referred to “watercourses” below) would be crossed by the route alternatives within this segment. The Minnesota River is the major river running through this segment.

The Preferred Route and associated route alternatives would cross the Minnesota River at the Le Sueur treatment pond (Le Sueur Treatment Pond Crossing; Map 7.4-23E, Appendix A), while the Alternate Route and associated route alternatives would cross the Minnesota River about one mile west of Belle Plaine (West Belle Plaine Crossing; Map 7.4-23E, Appendix A). The Le Sueur Treatment Pond Crossing is located about 0.8 miles north of Le Sueur. Although this crossing follows no existing infrastructure crossings of the river, the existing treatment pond is a disturbed area that allows for few new impacts to resources. The West Belle Plaine Crossing would follow an existing 69 kV transmission line across the river. Because this river crossing follows an existing ROW, new impacts to resources would be minimized.

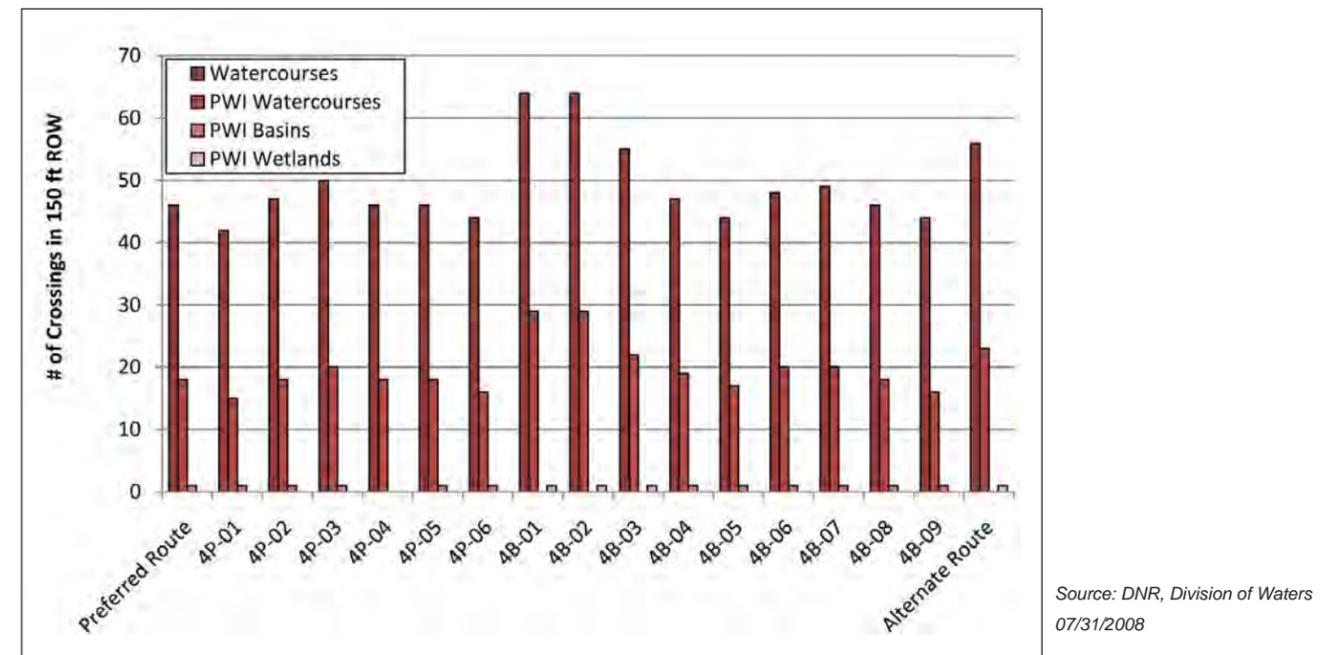
Impacts to woodlands would be moderate to high at the Le Sueur Treatment Pond Crossing

and moderate at the West Belle Plaine Crossing. In addition, because the 100 year floodplain associated with the Minnesota River at these crossings is wider than 1,000 feet, one or more transmission structures may have to be placed within designated 100 year floodplain. See Appendix I of the RPA for additional information on the Le Sueur Treatment Pond and West Belle Plaine Crossings.

Figure 7.4.4.11-1 summarizes the number of watercourse and PWI crossings that would occur within each route alternative within this segment. The following four route alternatives have the most watercourse and PWI watercourse crossings within their 150-foot ROW: segment 4 Alternate Route, 4B-01, 4B-02, and 4B-03 (Figure 7.4.4.11-1). In addition, these are the only four route alternatives with PWI wetlands within their 150-foot ROW. However, 12 of the remaining 13 route alternatives would cross Bucks Lake (Map 7.4-23E), a PWI basin that is known by local residents for having exceptional bird watching. Route alternative 4P-04 would not cross Bucks Lake or any other PWI basins or wetlands (Maps 7.4-23E and 7.4-23W, Figure 7.4.4.11-1). There are no designated trout streams or Wild and Scenic Rivers located within the 150-foot ROW or the 1,000-foot route width of any of the route alternatives within this segment.

Wetlands within the vicinity of the route alternatives within this segment consist mostly of small scattered freshwater emergent wetlands, with a few freshwater ponds, riverine wetlands, and forested and shrub dominated wetlands also present. Figure 7.4.4.11-2 summarizes the total acres of wetland and forested wetland that are located within the 150-foot ROW of each route alternative within this segment. Route

Figure 7.4.4.11-1. Number of watercourse and PWI crossings within the proposed 150-foot ROW of each route alternative



Source: DNR, Division of Waters
07/31/2008

Figure 7.4.4.11-2. Acres of wetland and forested wetland within the proposed 150-foot ROW of each route alternative

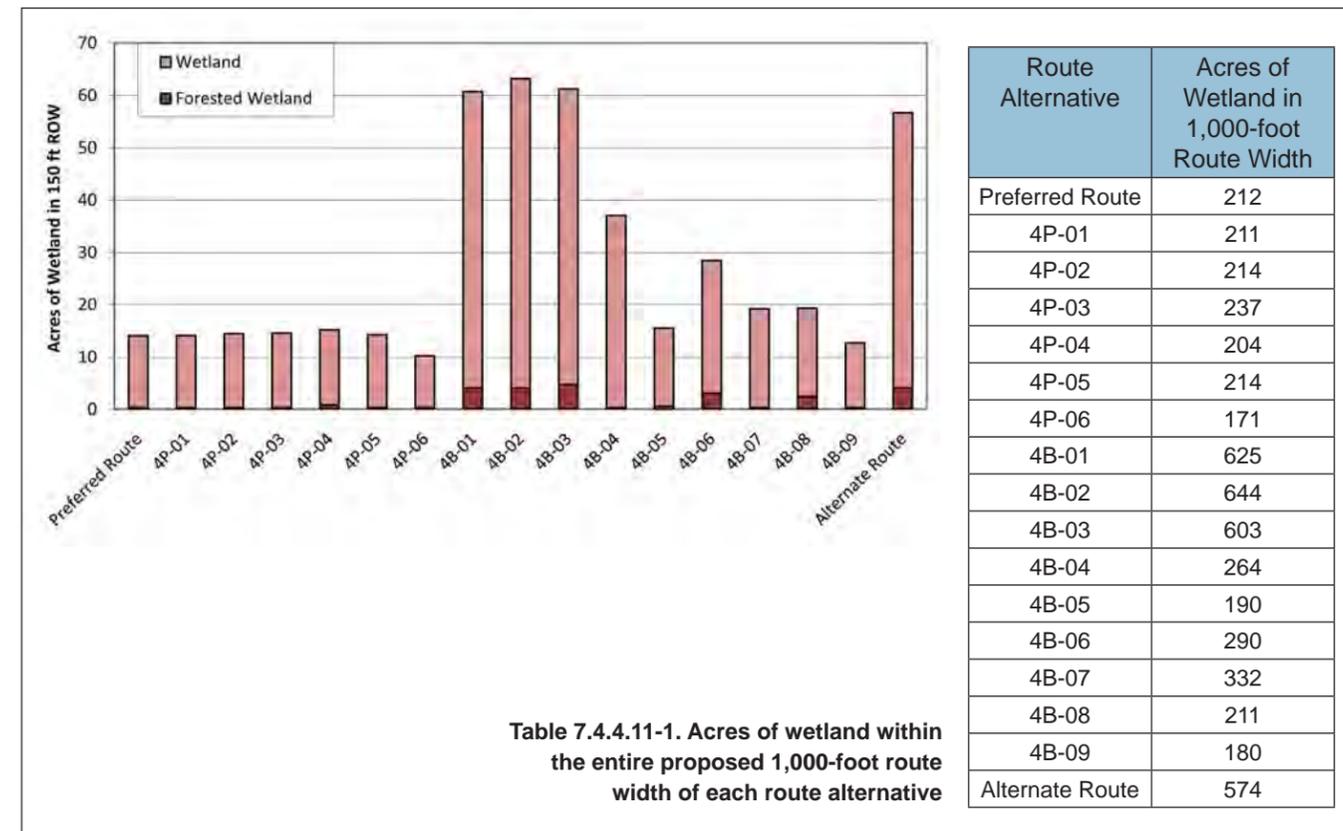


Table 7.4.4.11-1. Acres of wetland within the entire proposed 1,000-foot route width of each route alternative

Source: U.S. Fish and Wildlife Service, Division of Habitat and Resource Conservation

Environmental Impacts

alternatives 4B-05 and 4B-09 and the Preferred Route and associated route alternatives have the fewest acres of wetlands within their 150-foot ROW and 1,000-foot route width (Figure 7.4.4.11-2, Table 7.4.4.11-1). In addition, these route alternatives, as well as 4B-07, have the fewest acres of forested wetlands within their 150-foot ROW (Figure 7.4.4.11-2). A significant portion of the forested wetland acreage in the 150-foot ROW of the segment 4 Alternate Route and route alternatives 4B-02 and 4B-01 is located where these routes cross the Minnesota River (Map 7.4-23E).

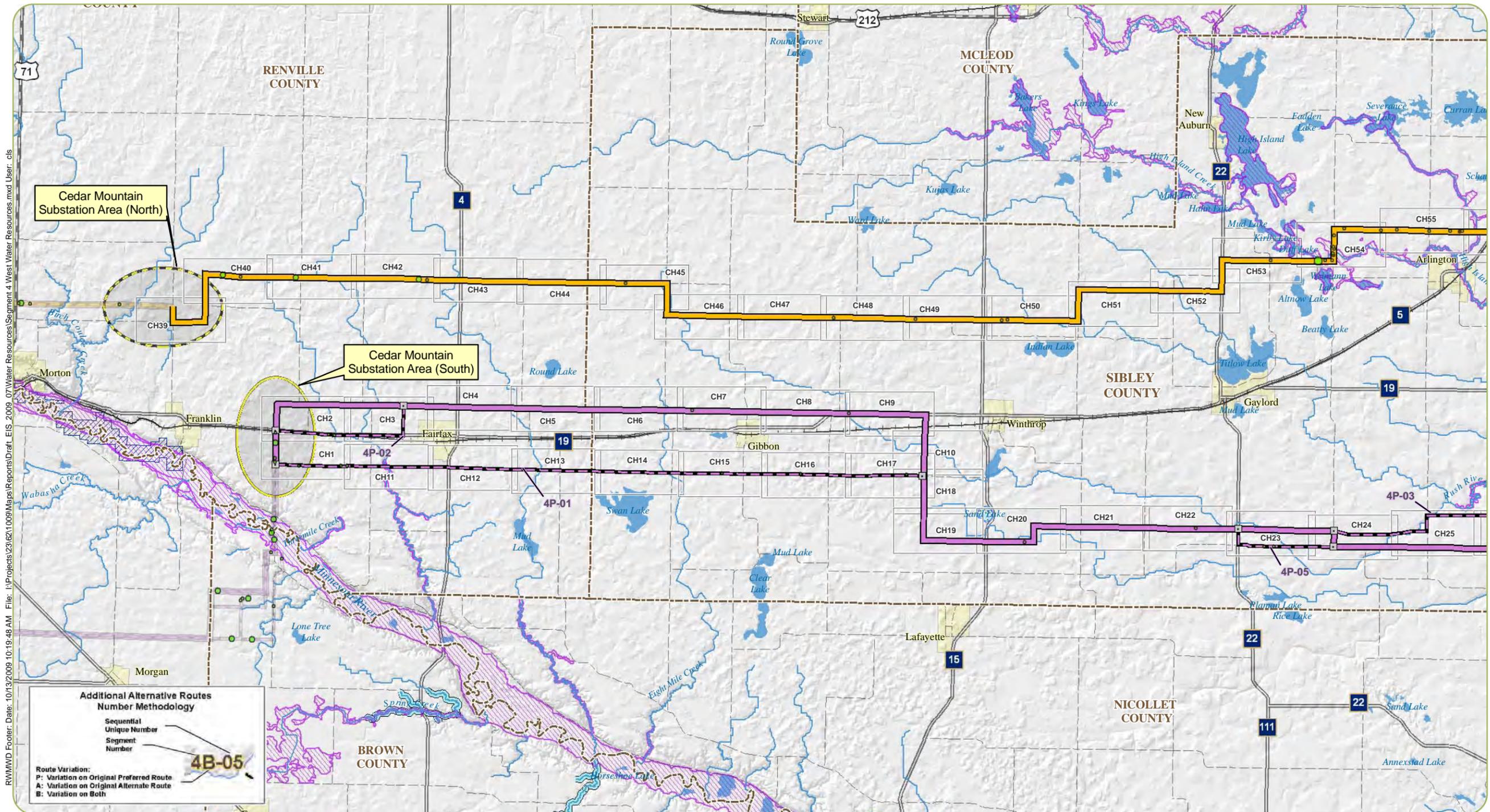
Although wetlands would be spanned to the extent possible, there are wetlands in the segment 4 Alternate Route (4 wetlands) and route alternatives 4B-03 (4 wetlands), 4B-01 (3 wetlands), 4B-02 (3 wetlands), 4B-04 (1 wetland), and 4B-05 (1 wetland) that are wider than 1,000 and may require placement of one or more poles within them. However, following detailed route planning, it is possible that some of these wetlands could be spanned or avoided.

Mitigation

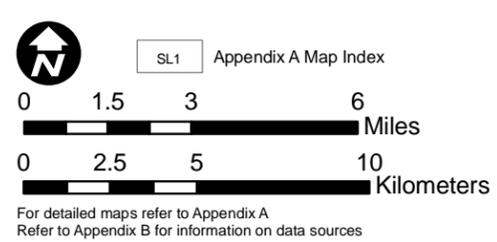
General mitigation measures that would be employed to minimize impacts to water resources are discussed in Section 6.11. Within this route segment, impacts to water resources can be managed by choosing a route alternative that minimizes the proximity of the line to watercourses, lakes, and wetlands. Because all watercourses and lakes would be spanned, no structures would be placed within these features and no direct impacts to watercourses and lakes are anticipated. However, one or more poles may have to be placed within designated 100 year floodplain at the Minnesota River crossings. Potential indirect impacts to watercourses and lakes, such as increases in turbidity, may be minimized through use of BMPs and by choosing route alternative 4P-04 which has a similar number of watercourse and PWI watercourse crossing to several other route alternatives but would not require crossing a PWI basin (Bucks Lake) or wetland.

Temporary impacts to wetlands may occur if they need to be crossed during construction. Utilizing BMPs and choosing the Preferred

Route, one of the associated route alternatives to the Preferred Route, or route alternatives 4B-09 or 4B-05, which have the least acres of wetland within the 150-foot ROW would minimize temporary impacts to wetlands. Permanent impacts to wetlands may occur if structures need to be placed within wetland boundaries; choosing the Preferred Route or one of the route alternatives to the Preferred Route, none of which have wetlands wider than 1,000 feet within the 150-foot ROW, would minimize these impacts. Permanent impacts to wetlands may also occur if the wetlands within the 150-foot ROW are currently forested. Forested wetlands may undergo a conversion to non-forested wetlands because vegetation maintenance procedures under transmission lines may prohibit trees from establishing. Choosing the Preferred Route, one of the associated route alternatives to the Preferred Route, or route alternatives 4B-09, 4B-07, or 4B-05, all of which have the fewest acres of forested wetland within the 150-foot ROW, would minimize impacts to forested wetlands.

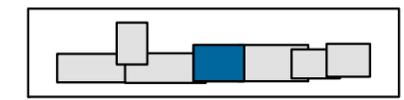


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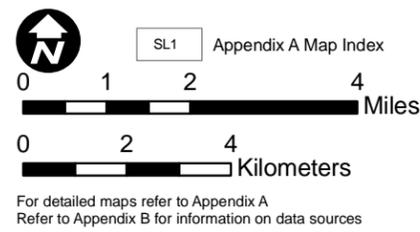
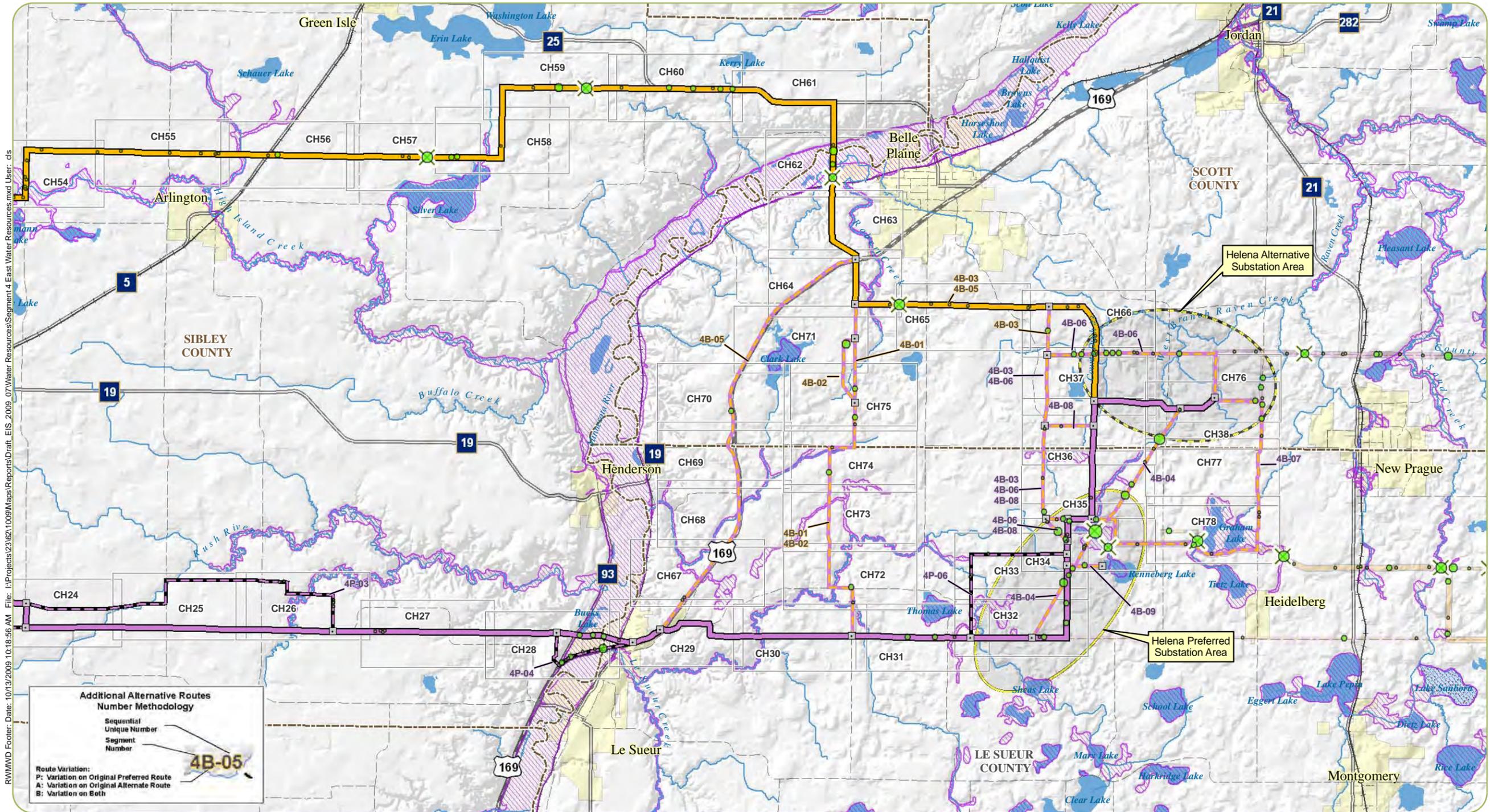


- | | | | |
|-------------------------------|---------------------------|--------------------------------|------------------------------------|
| Original Alignments | Project Substations | Wetland Crossings > 1,000 Feet | Designated Wildlife Lakes |
| Preferred Route | Proposed Substation Areas | Wetland Area (acres) | Public Waters Inventory Basins |
| Alternate Route | Preferred | within 150-foot ROW | Public Water Inventory Watercourse |
| Additional Alternative Routes | Alternate | 0.0 - 0.5 | |
| Variation on Preferred Route | County Boundaries | 0.6 - 2.5 | |
| Variation on Alternate Route | Q3 FEMA Floodplain | 2.6 - 5.0 | |
| Variation on Both | Trout Streams | 5.1 - 10.0 | |
| | Wild and Scenic Rivers | 10.1 - 20.4 | |

Map 7.4-23W
Water Resources Map
Segment 4 West, Cedar Mountain
Substation Area to Helena Substation Area

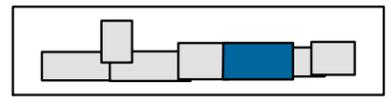


Source: Refer to Appendix B for information on data sources



- Original Alignments
 - Preferred Route
 - Alternate Route
- Additional Alternative Routes
 - Variation on Preferred Route
 - Variation on Alternate Route
 - Variation on Both
- Proposed Substation Areas
 - Preferred
 - Alternate
- County Boundaries
- Q3 FEMA Floodplain
- Trout Streams
- Wild and Scenic Rivers
- Wetland Crossings > 1,000 Feet
- Wetland Area (acres) within 150-foot ROW
 - 0.0 - 0.5
 - 0.6 - 2.5
 - 2.6 - 5.0
 - 5.1 - 10.0
 - 10.1 - 20.4
- Designated Wildlife Lakes
- Public Waters Inventory Basins
- Public Water Inventory Watercourse

Map 7.4-23E
 Water Resources Map
 Segment 4 East, Cedar Mountain
 Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

7.4.4.12 Flora and Fauna—Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Flora

Vegetation communities on this segment were evaluated using GAP Level 3 data and DNR NHIS data (Maps 7.4-20E, 7.4-20W, 7.4-25E, and 7.4-25W and Appendix A). The GAP database provides information on general vegetative cover; details on GAP data are provided in Section 6.12. The NHIS database identifies unique and/or native plant community types. Native plant community types are discussed in detail in Section 6.13.

Figure 7.4.4.12-1 and Maps 7.4-20E and 7.4-20W summarize the GAP vegetation data within the 150-foot ROW of each route alternative within this segment. There is little variation in vegetation cover between the route alternatives. Cropland is the dominant vegetation type across all of the route alternatives within this segment, with grasslands representing most of the remaining vegetation cover within each route alternative (Figure 7.4.4.12-1). Grasslands comprise most of the remaining vegetation cover within each route alternative. Other types present include upland shrublands, oak and cottonwood woods, marshes, and wet forested areas.

Several DNR-designated unique native plant community types are located within the route alternatives within this segment; these include southern dry hill prairies, southern mesic prairies, and southwestern calcareous fens. The Alternate Route and 1A-01 route alternatives have a southern dry hill prairie community and two calcareous fens within one mile of their centerline. All route alternatives within this segment except 1P-02 have at least one southern mesic prairie

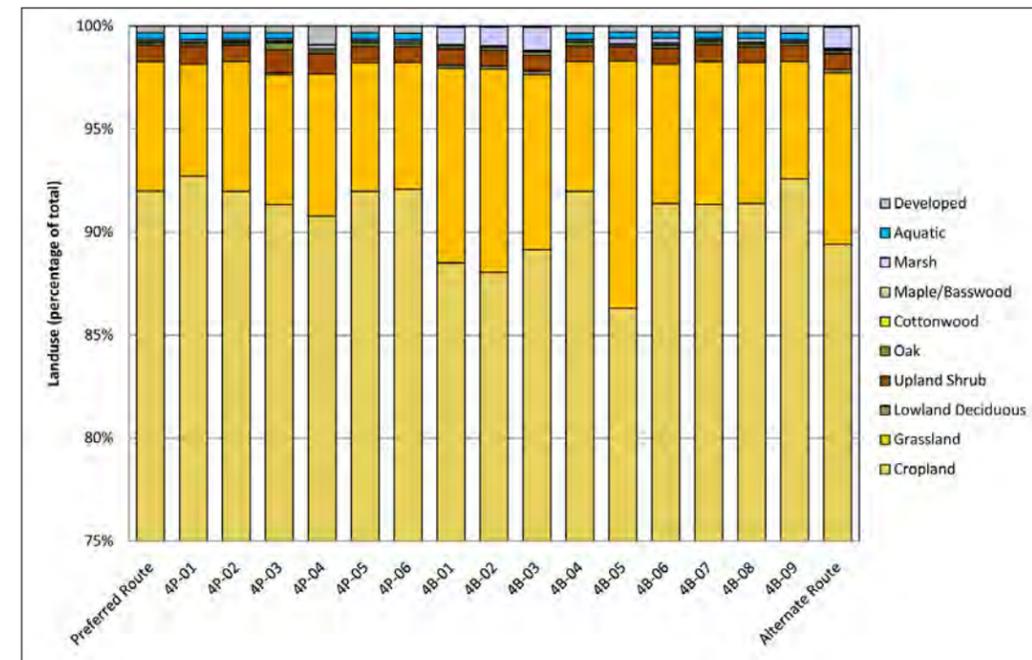
within one mile of their centerline. See Appendix D for details on the number of occurrences of these communities within one mile of the centerline and within the 150-foot ROW of each route alternative.

Fauna

The presence of wildlife species and wildlife habitat on this segment was evaluated using GAP Level 3 data and information on WMAs, WPAs, and USFWS National Wildlife Refuges (Maps 7.4-24E and 7.4-24W). GAP information provides an overview of the vegetation communities present, and hence the availability of forage, cover and reproductive habitats for various wildlife species (see Section 6.12 for further details on GAP data). WMA and WPA data pinpoint locations where wildlife species may be more prevalent and/or diverse. WMAs and WPAs within the 150-foot ROW, the 1,000-foot route width, and within one mile of the routes in this segment were included in the evaluation. WMAs within or adjacent to the ROW are discussed in Section 7.4.4.10.

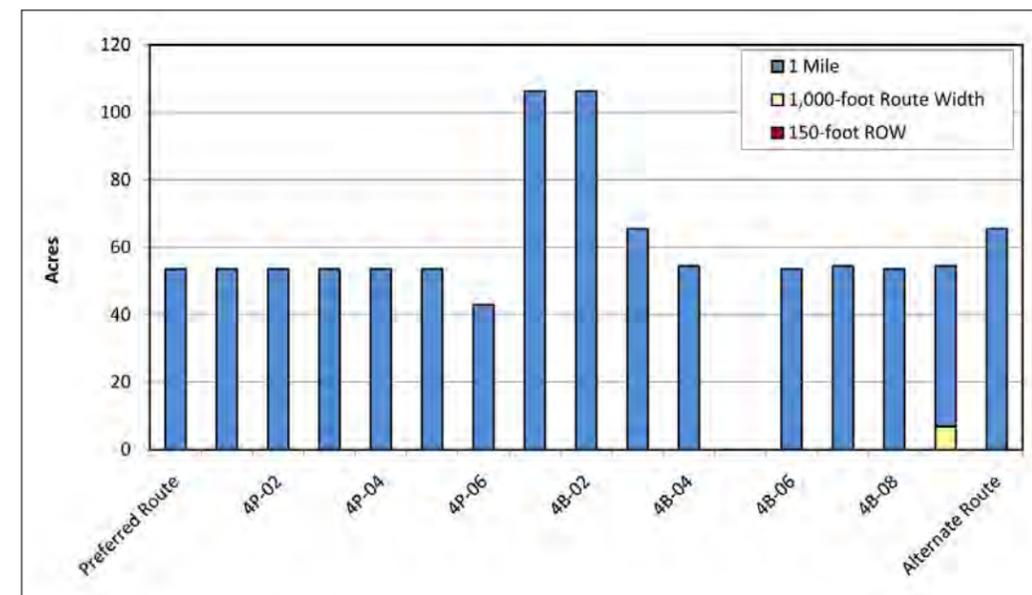
The relative cover of non-cropland vegetation is higher in this segment than in other segments. With the exception of route alternatives 4B-01 and 4B-02, the overall acreage of WPAs and WMAs is similar across route alternatives. The Minnesota Valley National Wildlife Refuge is located within the 150-foot ROW and 1,000-foot route width of the Alternate Route and the 4B-01, 4B-02, and 4B-03 route alternatives (Maps 7.4-24E and 7.4-24W and Appendix A). This wildlife refuge is located within one mile of each route alternative within this segment (Maps 7.4-24E and 7.4-24W). The City of Henderson, which is in this segment, actively promotes bird-watching and other wildlife-related activities, due to its close proximity to the Minnesota River Valley.

Figure 7.4.4.12-1. Summary of GAP vegetation data within 150-foot ROW for each route alternative



Source: DNR, Department of Forestry 06/06/2002

Figure 7.4.4.12-2. Acres of WPAs within one mile, the 1000-foot route width and within 150-foot ROW of each route alternative



Source: United States Fish and Wildlife Service 05/11/2009

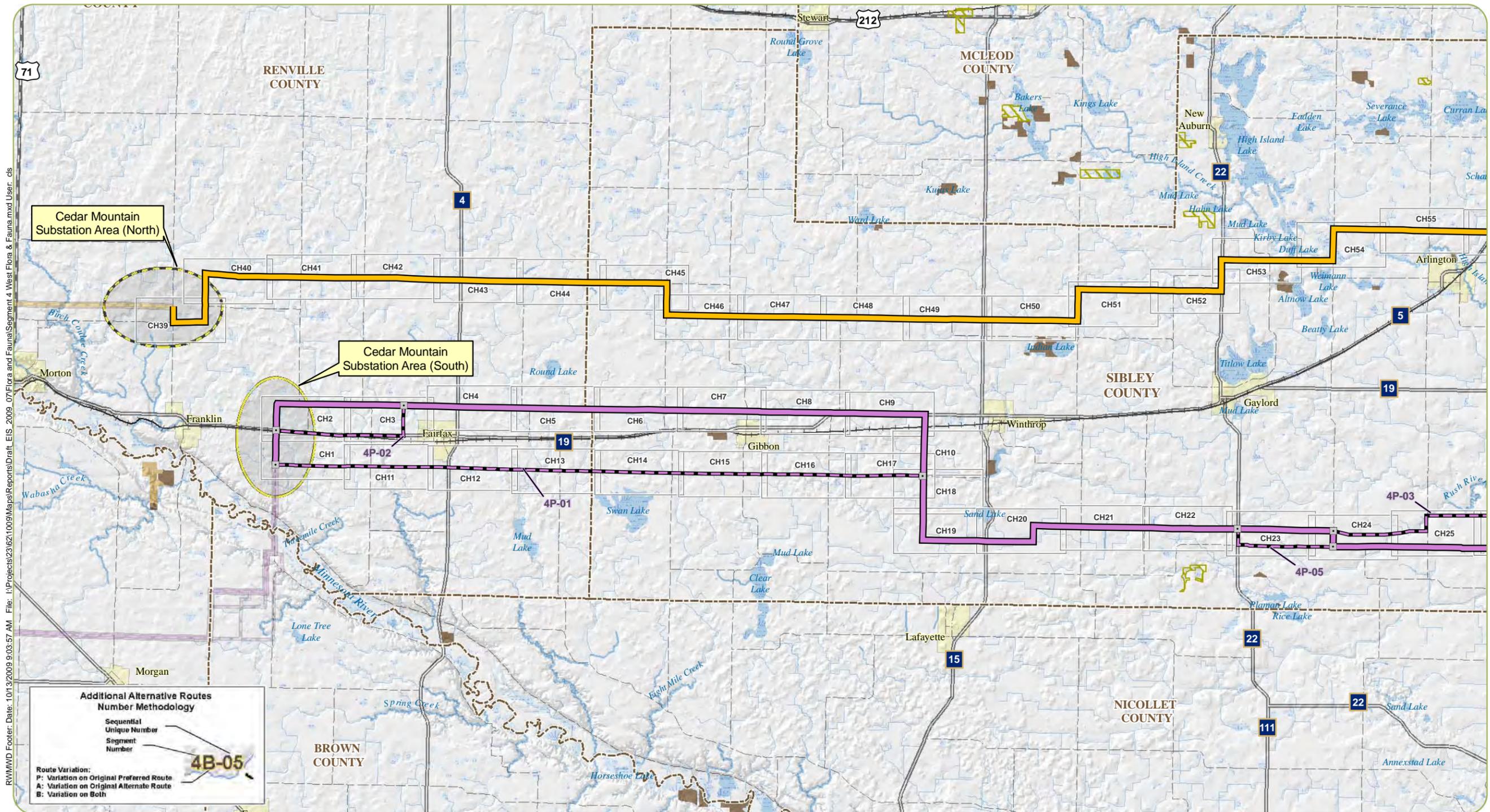
Environmental Impacts

Mitigation

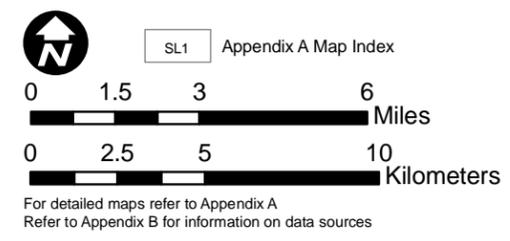
General temporary and permanent impacts to vegetation and wildlife resources for this segment are described in Section 6.12. Habitats where native prairie remnants, other unique plant communities, and rock outcrops have been recorded or are likely to occur would be spanned as feasible.

Construction impacts to most vegetation cover types would be mitigated with seeding of disturbed areas with native plant species, unless the area is to be returned to agricultural use. Removal of trees would be minimized; however, in order to safely operate the transmission line, trees removed from beneath or immediately adjacent to the line cannot be replaced.

Avian collisions with the transmission line may also occur in this segment. The applicant would work with DNR and USFWS to identify areas that may require marking transmission line shield wires, bird flight diverters, or using alternate structures to reduce the likelihood of collisions.



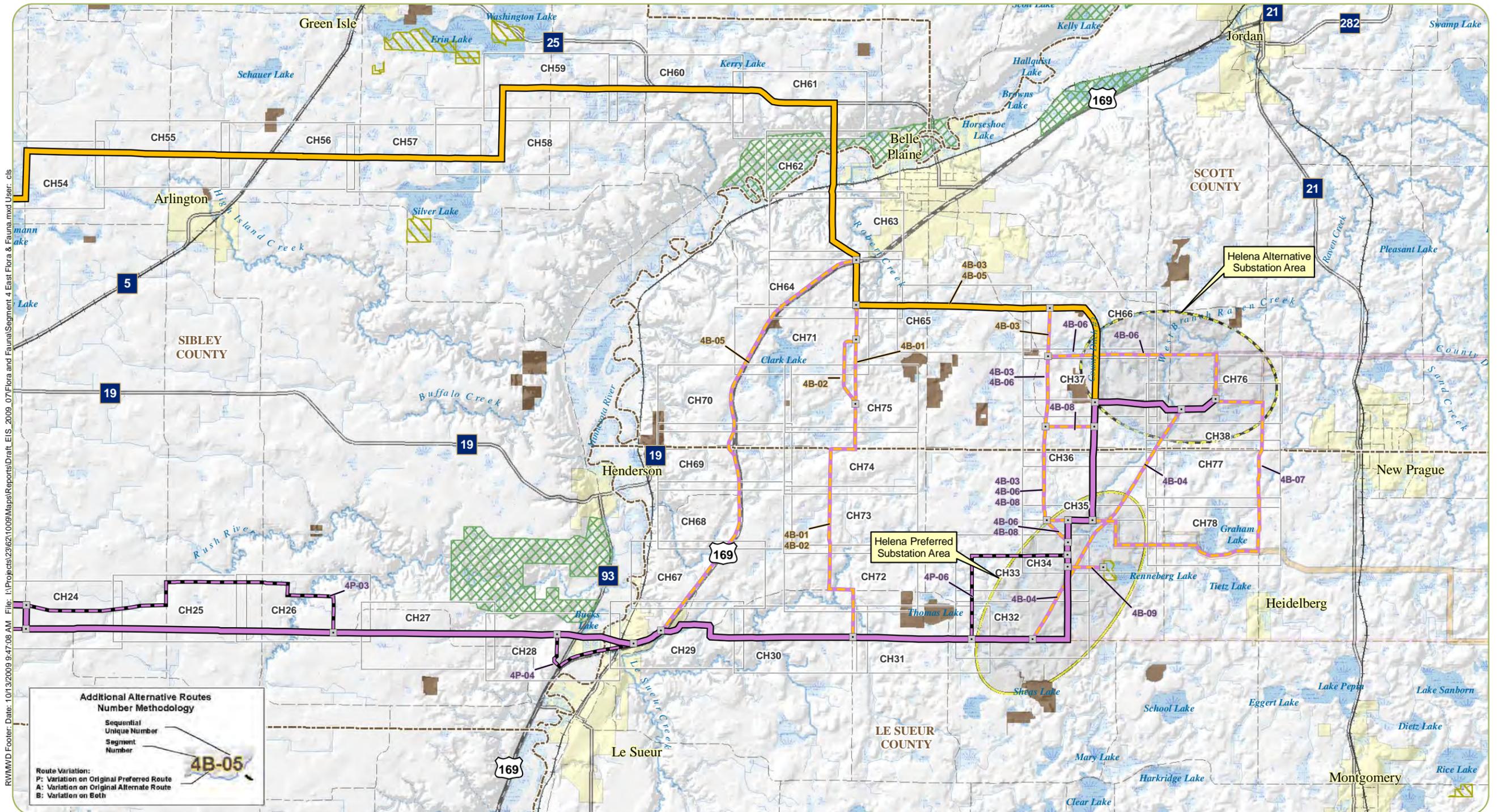
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Map 7.4-24W
Flora & Fauna Map
Segment 4 West, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
 P: Variation on Original Preferred Route
 A: Variation on Original Alternate Route
 B: Variation on Both

SL1 Appendix A Map Index

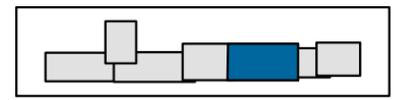
0 1 2 4 Miles

0 2 4 Kilometers

For detailed maps refer to Appendix A
 Refer to Appendix B for information on data sources

Original Alignments	Proposed Substation Areas	Fish Technology Center	Scientific and Natural Area
Preferred Route	Preferred	Fisheries Research Station	Wildlife Management Area
Alternate Route	Alternate	National Fish Hatchery	Wildlife Refuge
Additional Alternative Routes	County Boundaries	National Wildlife Refuge	Wetland (NWI)
Variation on Preferred Route		Waterfowl Production Area	
Variation on Alternate Route			
Variation on Both			

Map 7.4-24E
 Flora & Fauna Map
 Segment 4 East, Cedar Mountain
 Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources

7.4.4.13 Rare and Unique Resources— Analysis of Segment Alternatives for the Cedar Mountain Substation to Helena Substation

Rare and unique resources were identified within one mile of each route alternative within the Cedar Mountain Substation to Helena Substation segment using the DNR NHIS, DNR state-designated railroad prairies, and MCBS databases (see Appendix B). The following discussions focus on federal and state protected species and rare and unique communities located within one mile of each route alternative. Data on rare communities, animal assemblages, and MCBS sites are summarized in this section; however, complete data sets for each route alternative are available in Appendix D. There is no legal protection for state special concern and non-status species within the State of Minnesota. These data are outside the focus of this discussion and are available in Appendix D. In addition, waterbodies and watercourses would be spanned; therefore it is anticipated that impacts to threatened and endangered aquatic species would be avoided. Because of this, aquatic

species are mentioned but are not the focus of discussion.

Table 7.4.4.13-1 and Maps 7.4-25E and 7.4-25W summarize the rare and unique resources documented within one mile of the route alternatives within this segment (see Appendix A for more detailed maps). However, in order to protect rare resources from exploitation or destruction, Maps 7.4-25E and 7.4-25W and Appendix A do not indicate the names of species or communities identified within the NHIS database. There are several rare and unique resources present within the vicinity of this route segment, many of which are located within the area surrounding the Minnesota River (Maps 7.4-25E and 7.4-25W). In addition, there are significantly fewer rare and unique resources located within one mile of the segment 4 Alternate Route and the 4B-01, 4B-05, and 4B-03 route alternatives, relative to the segment 4 Preferred Route and the other 12 route alternatives (Table 7.4.4.13-1, Maps 7.4-25E and 7.4-25W).

Two state-endangered and three state-threatened species have been documented within one mile of various route alternatives within this segment, these include the following state-endangered species: the rock pocketbook mussel (*Arcidens confragosus*) and the yellow sandshell mussel (*Lampsilis teres*), and the following state-threatened species: kitten-tails (*Besseya bullii*), the trumpeter swan (*Cygnus buccinator*), and the paddlefish (*Polyodon spathula*). The non-aquatic listed species include kitten-tails and the trumpeter swan. Kitten-tails has been documented within one mile of the following four route alternatives: Alternate Route, 4B-01, 4B-02, and 4B-03 (Table 7.4.4.13-1). While the trumpeter swan has only been documented within one mile of the 4P-01 route alternative (Table 7.4.4.13-1), bald eagles are common along this portion of the Minnesota River and have been documented within one mile of each route alternative within this segment (Appendix D). While bald eagles are not listed at the federal level and are only listed as special concern at the state level, they are protected at the federal level by the Migratory Bird Treaty Act and the Bald

and Golden Eagle Protection Act (see Section 6.12 for more information).

Kitten-tails is a vascular plant that inhabits oak savannas and dry prairies along bluffs and terraces of the Minnesota River valley (DNR 2009). Trumpeter swans prefer wetlands, small ponds, and lakes with dominated by cattails, bulrushes, sedges, or horsetails (DNR 2009). Bald eagles typically reside in forested areas around lakes and streams.

Rare communities have been documented within one mile of each route alternative within this segment (Table 7.4.4.13-1, Maps 7.4-25E and 7.4-25W; see Appendix D for community types), with the following four route alternatives having at least one rare community within their 150-foot ROWs: segment 4 Alternate Route, 4P-03, 4B-01, 4B-02, and 4B-03 (Table 7.4.4.13-1). There is a colonial waterbird nesting site within one mile of several route alternatives within this segment (Table 7.4.4.13-1). There are state-designated railroad prairies within one mile of each route alternative within this segment, with route alternative 4P-01 having the fewest (only one). With the exception of route alternative 4P-01, there is at least one state-designated railroad prairie within the 150-foot ROW of each route alternative. However, there are significantly more state-designated railroad prairies within the 150-foot ROW of route alternative 4P-02 relative to the other route alternatives within this segment. There are MCBS sites within one mile of all route alternatives within this segment, with the segment 4 Alternate Route and 4B-03 route alternative having the fewest MCBS sites. However, all route alternatives except 4P-01 have at least one MCBS site within their 150-foot ROWs (Table 7.4.4.13-1).

Table 7.4.4.13-1. Summary of rare and unique resources within one mile of each route alternative

Common Name	Scientific Name	Type	MN Status	U.S. Status	Route Alternatives																	
					Preferred	4P-01	4P-02	4P-03	4P-04	4P-05	4P-06	4B-01	4B-02	4B-03	4B-04	4B-05	4B-06	4B-07	4B-08	4B-09	Alternate	
Rock Pocketbook	<i>Arcidens confragosus</i>	Zoological	END	NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Yellow Sandshell	<i>Lampsilis teres</i>	Zoological	END	NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Kitten-tails	<i>Besseya bullii</i>	Botanical	THR	NONE									X	X	X							X
Trumpeter Swan	<i>Cygnus buccinator</i>	Zoological	THR	NONE		X																
Paddlefish	<i>Polyodon spathula</i>	Zoological	THR	NONE	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Rare Communities		Ecological	na	na	12	12	12	2/16	13	12	12	1/3	1/3	1/2	12	12	12	12	12	12	1/2	
Animal Assemblages		Zoological	na	na	1	1	1	1	1	1	1				1	1	1	1	1	1		
State-Designated Railroad Prairies			na	na	1/6	1	5/6	1/6	1/6	1/6	1/6	1/5	1/5	1/5	1/6	1/6	1/6	1/6	1/6	1/6	1/5	
MCBS Sites			na	na	1/11	11	1/11	2/14	1/12	1/11	1/10	1/5	1/5	1/4	1/10	1/18	1/11	1/11	1/11	1/11	1/4	

Source: Natural Heritage Information System Rare Features Data Copyright 2009 State of Minnesota, Department of Natural Resources

An "X" indicates the presence of that particular species within 1 mile of centerline, while a blank cell indicates that a particular species, community, or site is not within 1 mile of the centerline.

Rows in tan indicate non-aquatic state and/or federally-threatened or endangered species and rows in blue indicate aquatic state and/or federally-threatened or endangered species.

Cells in red indicate if and how many of the sites are located within the 150-foot ROW (e.g. 1/2 means that one of two total sites is located in the ROW).

"MCBS" = Minnesota County Biological Survey - data includes sites classified as outstanding, high, and moderate biodiversity significance.

Animal Assemblages includes colonial waterbird nesting sites and/or mussel sampling sites.

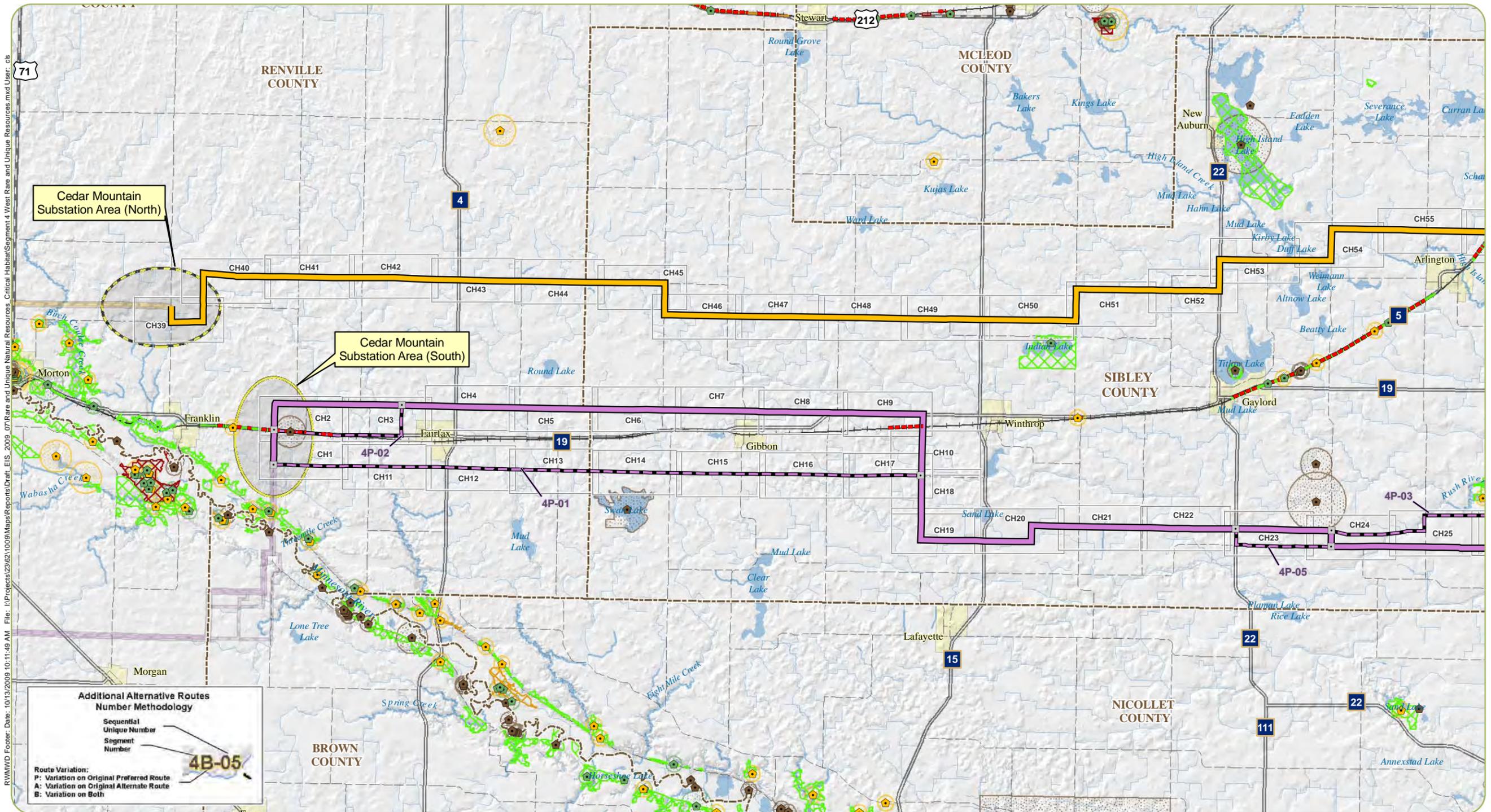
"END" = Endangered, "THR" = threatened, "None" = no federal status, "na" = not applicable.

Mitigation

General mitigation measures that would be employed to minimize impacts to rare and unique resources are discussed in Section 6.13. See Section 6.12 for a discussion of the measures that would be utilized to minimize the impacts of avian collisions with transmission lines. Within this route segment, threatened and endangered species are found within one mile of each route alternative. However, as previously stated, waterbodies and watercourses would be spanned and BMPs would be employed to minimize erosion and sedimentation. Because of this, impacts to the two mussel species and the paddlefish that were documented within one mile of each route alternative within this segment are not anticipated. Impacts to kitten-tails would be minimized by spanning or avoiding oak savannas and dry prairies or by choosing a route alternative other than the Alternate Route or route alternatives 4B-01, 4B-02, or 4B-03. Impacts to trumpeter swans would be minimized by spanning or avoiding wetlands and small ponds, in addition to larger waterbodies and watercourses or choosing a route alternative other than 4P-01. Impacts to bald eagles would be minimized by avoiding lakes and streams and the forested areas around them. If the rare species is unavoidable, a Takings Permit from the DNR may be required along with other conditions.

There are MCBS sites and DNR-listed rare natural communities within one mile of each route alternative within this segment. The placement of structures within MCBS and DNR-listed rare natural communities would be avoided or minimized by spanning them to the extent possible. Where structure placement cannot be avoided in these sensitive communities, rare

species associated with these habitats could be affected. Choosing route alternative 4P-01, which is the only route alternative that does not have any MCBS sites or rare communities within the 150-foot ROW, would minimize impacts to these rare resources.



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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

Route Variation:
P: Variation on Original Preferred Route
A: Variation on Original Alternate Route
B: Variation on Both

SL1 Appendix A Map Index

0 1.5 3 6 Miles

0 2.5 5 10 Kilometers

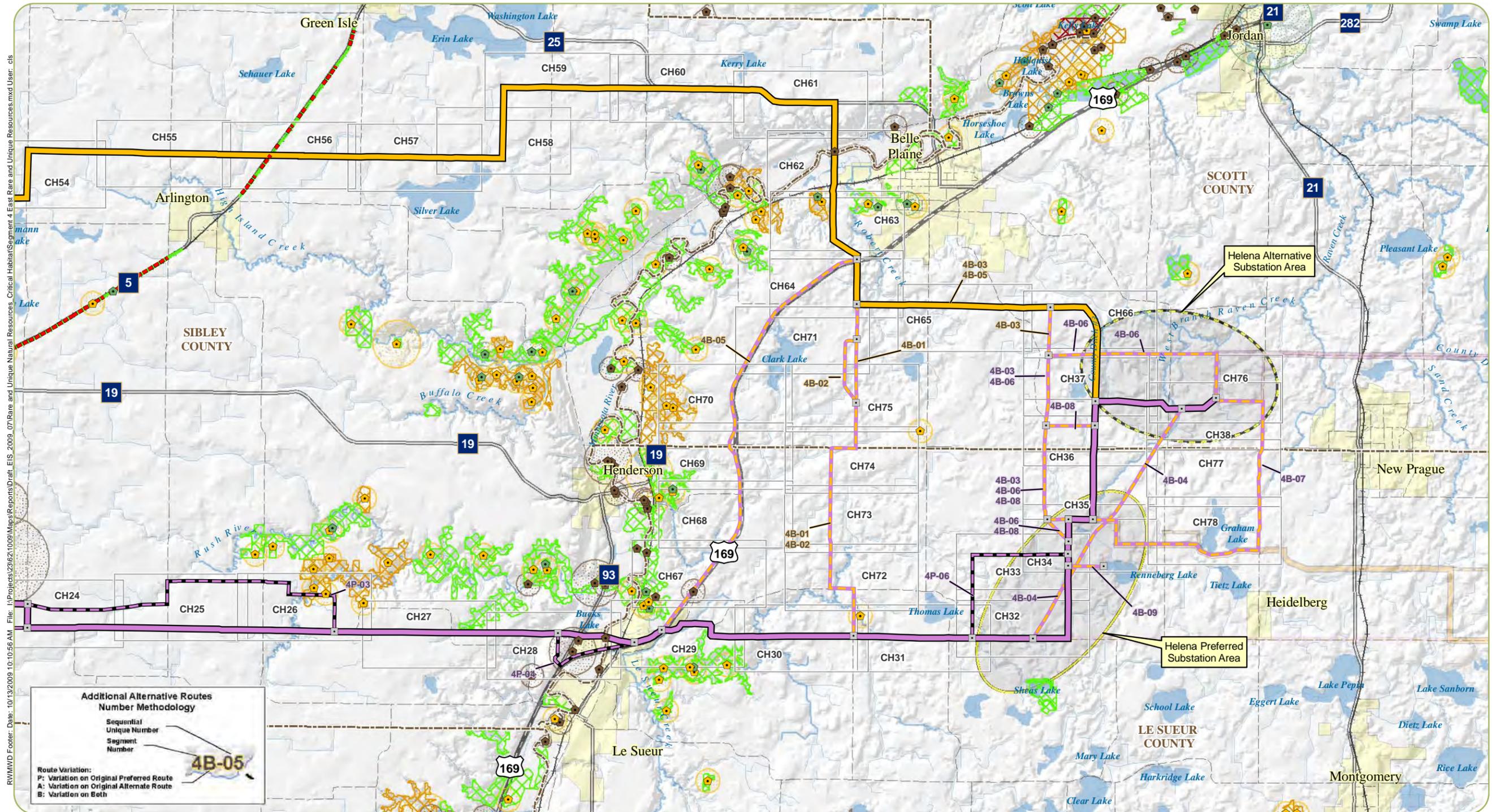
For detailed maps refer to Appendix A
Refer to Appendix B for information on data sources

- Original Alignments
- Preferred Route
- Alternate Route
- Additional Alternative Routes
- Variation on Preferred Route
- Variation on Alternate Route
- Variation on Both
- Project Substations
- Proposed Substation Areas
- Preferred
- Alternate
- County Boundaries
- MN DNR Natural Heritage
- Botanical
- Ecological
- Zoological
- Botanical
- Ecological
- Zoological
- State-Designated RR Prairie
- MCBS Biodiversity Significance
- Moderate Significance
- High Significance
- Outstanding Significance

Map 7.4-25W
Rare & Unique Resources/Critical Habitat Map
Segment 4 West, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources



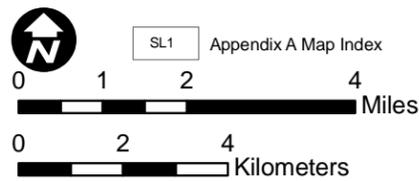
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Additional Alternative Routes Number Methodology

Sequential Unique Number
Segment Number

4B-05

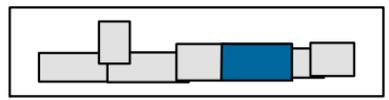
Route Variation:
P: Variation on Original Preferred Route
A: Variation on Original Alternate Route
B: Variation on Both



For detailed maps refer to Appendix A
Refer to Appendix B for information on data sources

- | | | | |
|-------------------------------|---------------------------|-------------------------|--------------------------------|
| Original Alignments | Proposed Substation Areas | MN DNR Natural Heritage | State-Designated RR Prairie |
| Preferred Route | Preferred | Botanical | MCBS Biodiversity Significance |
| Alternate Route | Alternate | Ecological | Moderate Significance |
| Additional Alternative Routes | County Boundaries | Zoological | High Significance |
| Variation on Preferred Route | | Botanical | Outstanding Significance |
| Variation on Alternate Route | | Ecological | |
| Variation on Both | | Zoological | |

Map 7.4-25E
Rare & Unique Resources/Critical Habitat Map
Segment 4 East, Cedar Mountain
Substation Area to Helena Substation Area



Source: Refer to Appendix B for information on data sources