4.0 Development and Screening of Alternatives

4.1 Route Development Process Summary

Minnesota Power (Applicant) identified the proposed Route Alternatives through an iterative process that used carefully selected routing factors to narrow the initial Study Area first into Study Corridors, then into Preliminary Route Alternatives, and finally into Refined Route Alternatives. Throughout this process, the Applicant received feedback from both the stakeholders and the public. Taking into account all of this information, as well as the applicable regulatory framework and the purpose and need for the Project, the Applicant has now identified the proposed Route Alternatives and Segment Options for consideration in this Route Permit Application (Application). The entire route development process leading to the identification of the Route Alternatives and Segment Options is discussed in detail below.

4.2 Development and Application of Routing Factors

The Applicant developed routing factors for the Project based on transmission line siting experience, knowledge of applicable federal and state regulations (including Minnesota Rule 7850.4100 and 4300), and stakeholder feedback. The routing factors guided the route development process.

The routing factors included the following components:

- → Constraints – Constraints are resources or conditions that could limit or prevent transmission line development. Avoiding those resources or conditions is a goal, but not necessarily a requirement, of the route development process. Constraints might include areas restricted by regulations, or areas where impacts on resources will be difficult to mitigate. Constraints include, for example: existing land uses such as homes, agriculture, religious facilities, and schools; federal, state, and locally designated environmental protection areas; sensitive habitats or areas identified by private conservation organizations; areas with special legal status such as Indian lands; cultural resources such as national landmarks and archaeological sites; and public infrastructure such as airports and aeronautical and commercial telecom structures. It is important for the route development process to account for the fact that Project development affects the various Constraints differently.
- → Opportunities – Opportunities are resources or conditions that will facilitate Project development. They include pre-existing linear infrastructure or other features (for example, roads, transmission lines, and public land survey divisions of land) along which Project development will be particularly compatible. Opportunities will also facilitate Project development by reducing impacts on Constraints. Furthermore, Minnesota Rule 7850.4100 indicates that the Minnesota Public Utilities Commission (PUC) will consider the use or paralleling of existing rights-of-way (ROWs) (for example, transportation corridors, pipelines, and electrical transmission lines), survey lines, natural division lines, and agricultural field boundaries.

→ Technical Guidelines – Technical Guidelines are the specific engineering requirements and objectives associated with the construction of the Project. For example, one engineering requirement included as part of the Technical Guidelines is the maintenance of at least 200 feet of separation between centerlines when paralleling other electric transmission lines of 230 kilovolts (kV) or above. Another engineering objective, included as part of the Technical Guidelines, is to minimize the overall length of the line. These Technical Guidelines are specific to the Project and provide the technical limitations related to the design, ROW requirements, and reliability concerns. Some Technical Guidelines apply to the entire Project, and others are specific to a particular segment of the Project.

The Applicant developed a list of potential Constraints, Opportunities, and Technical Guidelines that together comprise the routing factors for the Project. That list appears in Tables 4-1 and 4-2. It is important to note that not all of the items in Tables 4-1 and 4-2 are present in the Study Area, and that the list of routing factors did not remain static during the route development process. As additional Constraints and Opportunities were identified by stakeholders, the Applicant added them to the list of routing factors.

Opportunities were reviewed for the Project and considered in conjunction with potential Constraints. In some areas, existing linear infrastructure offered ROW corridors along which a transmission line might be located with less disruption to the natural and human environment. In other areas, there were no Opportunities to parallel existing ROW in the direction desired; exiting ROWs were too narrow or irregular in width and direction; or they were surrounded by relatively high concentrations of other Constraints, such as are typically found in more urban areas.

The Project Technical Guidelines listed in Tables 4-1 and 4-2 were identified through:

1. Regulatory requirements and guidelines
2. Technical expertise of engineers and other industry professionals responsible for the reliable and economic construction, operation, and maintenance of the Project, and other electric system facilities
3. Applicable codes and standards including the National Electrical Safety Code
4. North American Electric Reliability Corporation (NERC) reliability standards
5. Industry best practices

Table 4-1. Opportunities

Opportunities
Existing transmission lines[1]
Roadways and trails
Railroads[1]
Public land survey system (for example, section lines and half section lines)

Opportunities
Property lines (that is, legal divisions of land)
Natural division lines and agricultural field boundaries
Pipelines[1]
Formerly mined areas (non-active)[1]

Note:
[1]While some features may offer a routing opportunity; the nature of the feature may also constitute a constraint.

Table 4-2. Constraints and Prohibited Areas

Constraints	
Federal, State, and County Resources/Jurisdictions	
National wildlife (and fisheries) refuges	State wildlife management areas
State natural resource areas	State wildlife refuges and birding areas
Nature preserves	State scientific natural areas
Prairie restoration areas	Military lands and operations
National and state forests	Resource easement lands
Wild and scenic rivers	Indian reservations/Indian-owned lands
Non-Government Organization (NGO) Lands	
Conservation areas (for example, The Nature Conservancy and Sierra Club)	NGO resource easement lands
Important bird areas (for example, The Audubon Society)	
Special Status Species and Habitat	
Bald eagle and migratory bird regulations (for example, Bald and Golden Eagle Protection Act [BGEPA] and Migratory Bird Treaty Act [MBTA])	Bald eagle wintering and breeding habitat
Designated critical habitat	Threatened, endangered and protected species (known occurrence areas and habitat)
Cultural Resources	
Historic and cultural resources	Burial areas (prehistoric or historic)
National Register of Historic Places (that is, listed or eligible sites)	Cemeteries
Historic landscapes, trails, and markers	Cultural values (traditional communities)
National natural landmarks	Century and sesquicentennial farms

Constraints	
Visual Resources	
Scenic highways or corridors	Geological markers
Scenic overlooks	
Public Infrastructure	
Airports	Telecom (for example, communication towers and antenna structures)
Very high frequency omnidirectional range (VOR) (that is, aeronautic navigation equipment– clear zone)	Housing and homes (consider Environmental Justice)
Doppler radar systems	
Land Use	
Taconite mining operations (for example, tailings, pits, and mining structures)	Agriculture land
Planned development (that is, city and county plans)	Orchards
Commercial and industrial development	Forest land
Daycares, schools, and hospitals	Aggregate mine and quarries
Other structures (for example, billboards, barns, and sheds)	Trails (for example, local, snowmobile, bicycle, and horse)
Religious facilities	Recreation areas (for example, parks, golf courses, and off-highway vehicle [OHV] trails)
Safety regulations (for example, fireworks manufacturers, gas stations, and electrically sensitive areas)	Contaminated areas (for example, superfund and brownfield sites)
Center pivot and lateral move irrigation	
Natural Resources and Geomorphology	
Old growth forest areas – special management zones	Wetlands, peatlands, and calcareous fens
Flood control areas (that is, floodplain)	Native prairie
Lakes, ponds, reservoirs	Significant geomorphology or geologically unstable areas
Engineering Considerations	
Terrain and soil conditions	Size and type of foundation

Constraints	
Roadway access to for construction and maintenance	Inductive currents and interference
Number of special structures needed to avoid or minimize impacts on environmental features	Tree-trimming and vegetation management
Number of angle structures	Reliability and restorability
Prohibited Areas	
State or national wilderness areas	State scientific and natural areas
State and national parks	

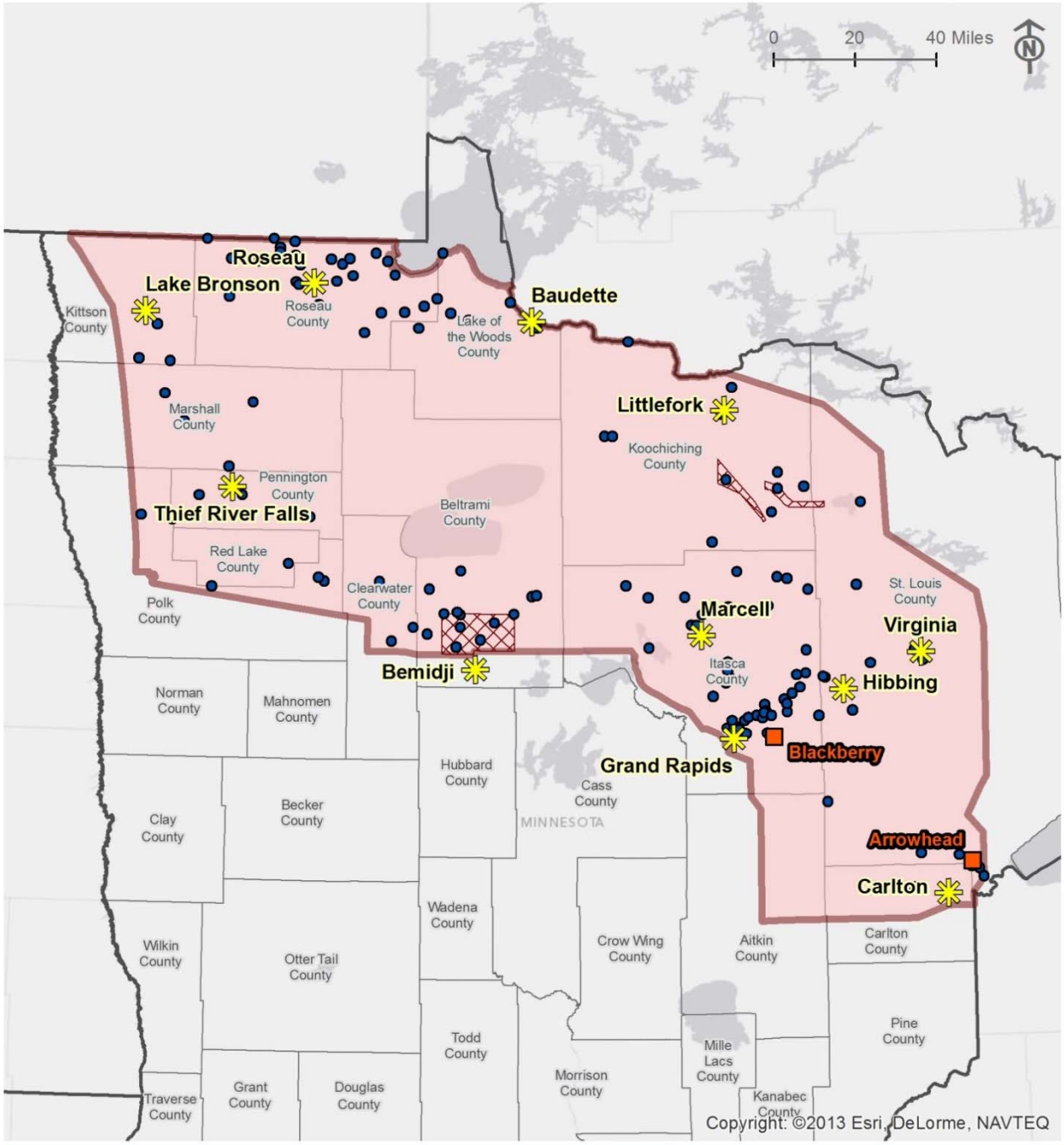
4.3 Data Collection

To identify Constraints and Opportunities within the Study Area, the Applicant started collecting data in April 2012, an effort that continued throughout the route development process. Sources included online data repositories; federal, state, and local agencies; aerial photo interpretation; field reconnaissance; and stakeholder comments. Field reconnaissance was conducted during the route development process from public roads and helicopter. Section 10.0, References includes a list of data sources/references for the Project.

4.4 Study Area Identification

The Study Area generally was delineated to include the Project endpoints (Minnesota-Manitoba Border Crossing Area and the delivery location at the proposed Blackberry 500 kV Substation) and major Opportunity features found between the endpoints (see Figure 4-1). The following sections describe the routing factors that influenced the boundaries of the Study Area. Feedback from agencies was solicited during the identification of the Study Area. See Appendix C for agency correspondence and public open house summaries.

Study Area Figure 4-1



Legend

- Stakeholder Workshop
- Study Area
- Substation
- State Boundary
- County Boundary
- Comment Point
- Comment Area

Sources: ESRI

\\mspe-gis-file\gisprojlarge\MinnPower\182035\map_docs\CLIENT\Route_Permit\04-01_StudyArea.mxd

4.4.1 Northern Boundary

The northern boundary includes a majority of the Minnesota-Manitoba Border Crossing Area. In the extreme northwestern corner of the Study Area, the northern boundary was developed to include an existing pipeline as a border crossing and route-paralleling Opportunity. In the northeastern edge of the Study Area, the northern boundary diverts from the Minnesota-Manitoba border near International Falls and continues southeast. Voyageurs National Park, Boundary Waters Canoe and Wilderness Area, Canada lynx Federal critical habitat, and the large lakes located near the Minnesota-Manitoba Border Crossing Area were avoided due to regulatory restrictions and engineering Constraints.

4.4.2 Eastern Boundary

The eastern boundary of the Study Area was selected to include State Highway 73 as an Opportunity and avoid Voyageurs National Park, Boundary Waters Canoe and Wilderness Area, and Canada lynx critical habitat. Development of the eastern boundary considered the Bois Forte Indian Reservation, State Highway 73, and large lakes in the area that cannot be spanned. Further southeast, the Study Area boundary included Opportunities through the Iron Range (for example, County Highway 135 near Biwabik, as the eastern-most Opportunity) while avoiding the large Lake Vermillion complex. The Iron Range presents a challenging routing situation in that it is a productive mining area with mining expansion occurring frequently. The Study Area was adjusted in this location to allow for additional Opportunities to the east while minimizing impacts on the adjacent Superior National Forest.

4.4.3 Southern Boundary

The southern boundary was developed to avoid numerous large lakes between Bemidji and Grand Rapids, while incorporating a number of east to west Opportunities. The southwestern portion of the Study Area boundary avoided the City of Crookston, but included a number of east to west oriented county highways (that is, County Highway 92, 222, and 223). Further east, the boundary included an existing 115 kV transmission line. Continuing eastward the boundary avoided the heavily populated area near Bemidji as well as large, un-spanable lakes (including Leech Lake). The boundary curved southeast to include County Highway 46. The heavily populated area of Grand Rapids initially was included in the Study Area because there are existing transmission lines that provide paralleling Opportunities across the actively mined Iron Range. Southeast of Grand Rapids, the boundary turned south to provide routing flexibility around the west side of the cluster of lakes in Aitkin County.

The Study Area did not include U.S. Highway 169, as there were other potential Opportunities to the east that were accessible from the proposed Blackberry 500 kV Substation. Locating the transmission line along U.S. Highway 169 could have greater impact on landowners, businesses, and industries than other eastern Opportunities.

Extending the Study Area further south, to include the U.S. Highway 2 corridor or more southern locations, was not considered feasible. The U.S. Highway 2 corridor already is crowded with numerous pipelines and an existing transmission line. The general public has expressed weariness at the potential of adding more utilities to this existing corridor.

Additionally, the known Constraints made the U.S. Highway 2 corridor undesirable. Areas to the south of U.S. Highway 2 include more lakes and residential properties. Potential conflicts with landowners will increase as compared to the northern areas (that is, areas south of Red Lake) that are available for siting the transmission line.

4.4.4 Western Boundary

The western boundary primarily followed a line where the soil types transition from fine textured, lacustrine silt and clay soil associations of the Red River Valley to the west (that is, outside of the Study Area) to medium textured, lacustrine loam and sandy soils associations of beach ridges to the east (that is, inside the Study Area). Previous Project experience and engineering information indicates that foundation construction and design costs are likely to increase where transmission structures are located in the shrink-swell soils of the Red River Valley. The Applicant used Natural Resources Conservation Service (NRCS) State Soil Geographic Database (STATSGO) and Ecological Classification Series profiles to determine the transition between the soil associations. The extreme northwestern portion of the Study Area boundary deviates from the soil type justification and extends into fine textured soils to include an existing pipeline Opportunity. Minnesota Highway 75 was excluded from the Study Area, because a large portion of that road traverses fine textured soils.

4.5 Study Corridor Identification

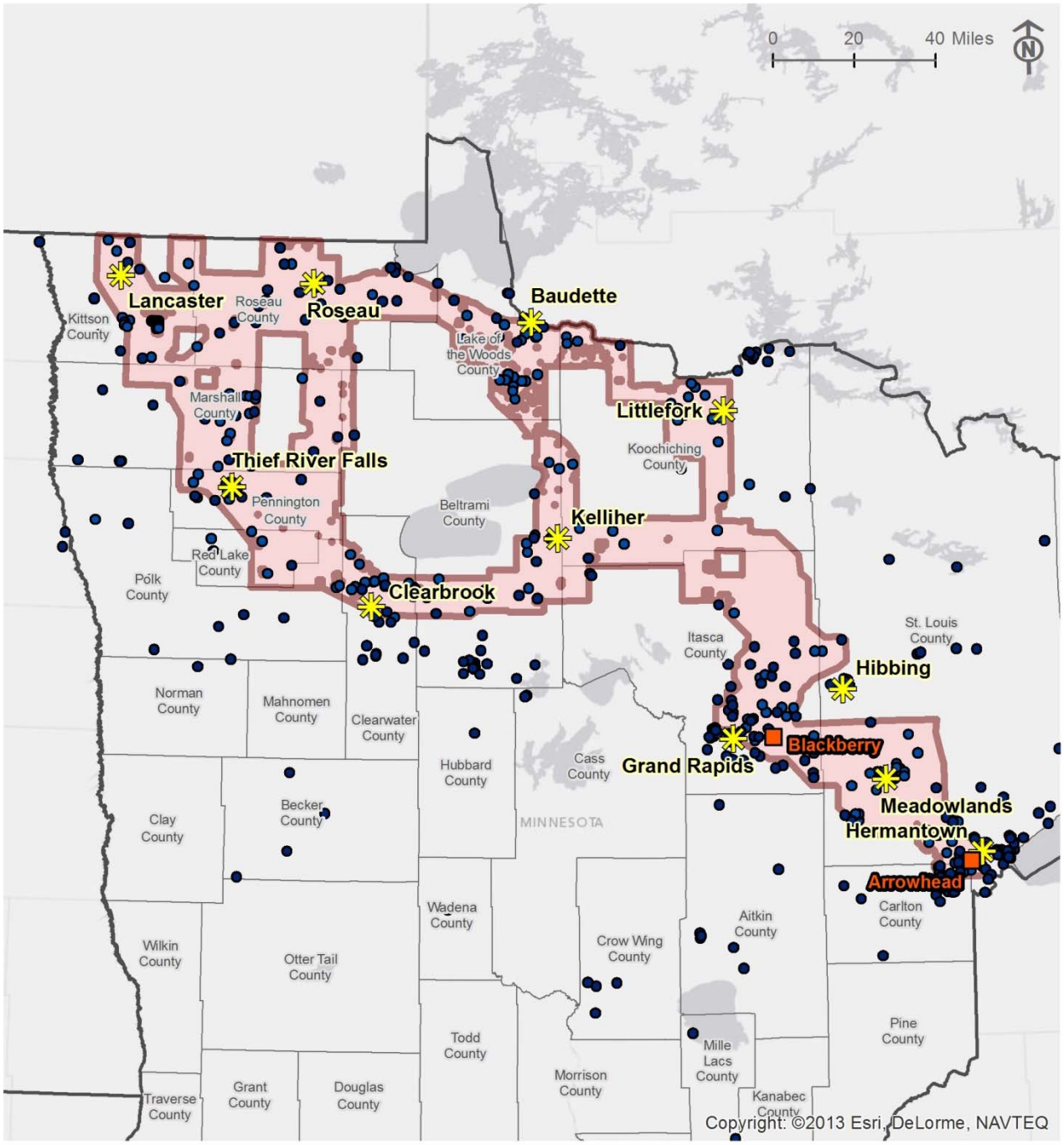
The Applicant developed the Study Corridors by reviewing collected data, meeting with stakeholders, and performing broad environmental and engineering analyses on the Study Area. The Study Corridors were generally 5 to 20 miles wide to allow for flexibility in determining Opportunities while avoiding concentrations of Constraints.

Applying this strategy, the Applicant selected Study Corridors that avoided Constraints such as densely populated areas, U.S. Fish and Wildlife National Wildlife Refuges, Tribal Lands and Reservations, Minnesota Scientific and Natural Areas, large lakes and areas with a high-density of lakes and large wetland complexes, and contiguous areas of relatively undisturbed natural resources.

The Study Corridors were presented to the public at the first round of open house meetings and to individual agencies during the fall 2012. These meetings provided information about the Project to the public and agencies, and allowed comments from them to be recorded for use during the next step of the route development process.

See Figures 4-2 and 4-3, and Appendix C for a summary of public and agency comments.

Study Corridor Figure 4-2



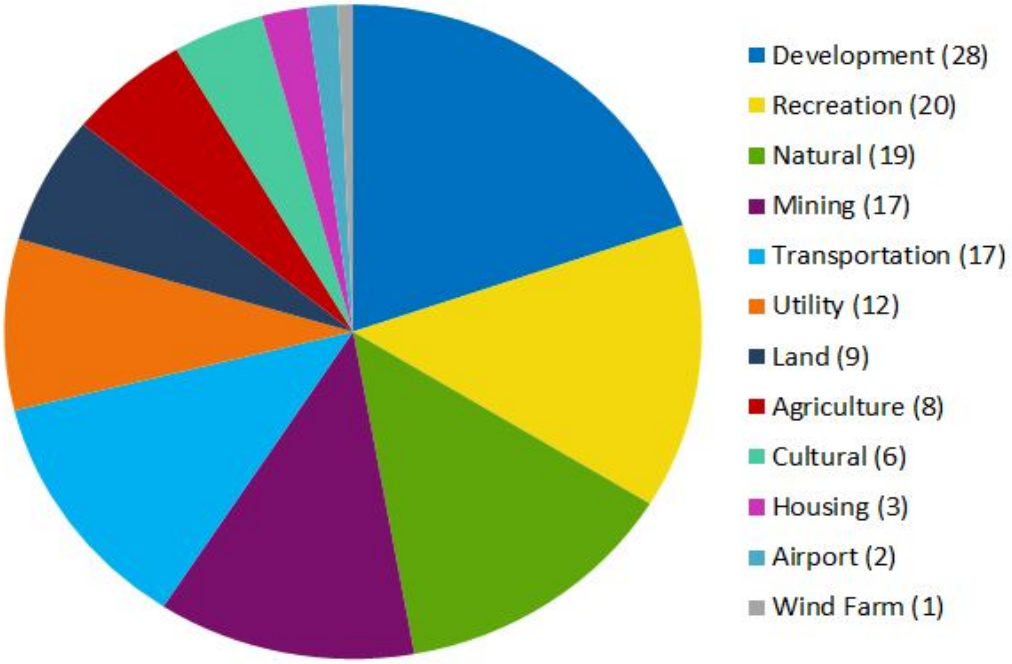
Legend

- Open House Location
- Comment Point
- Substation
- Study Corridor
- State Boundary
- County Boundary

Sources: ESRI

\\mspe-gis-file\GISProjLarge\MinnPower\182035\map_docs\CLIENT\Route_Permit\04-02_StudyCorridor.mxd

Figure 4-3. Fall 2012 Open House Meetings Comment Type and Number



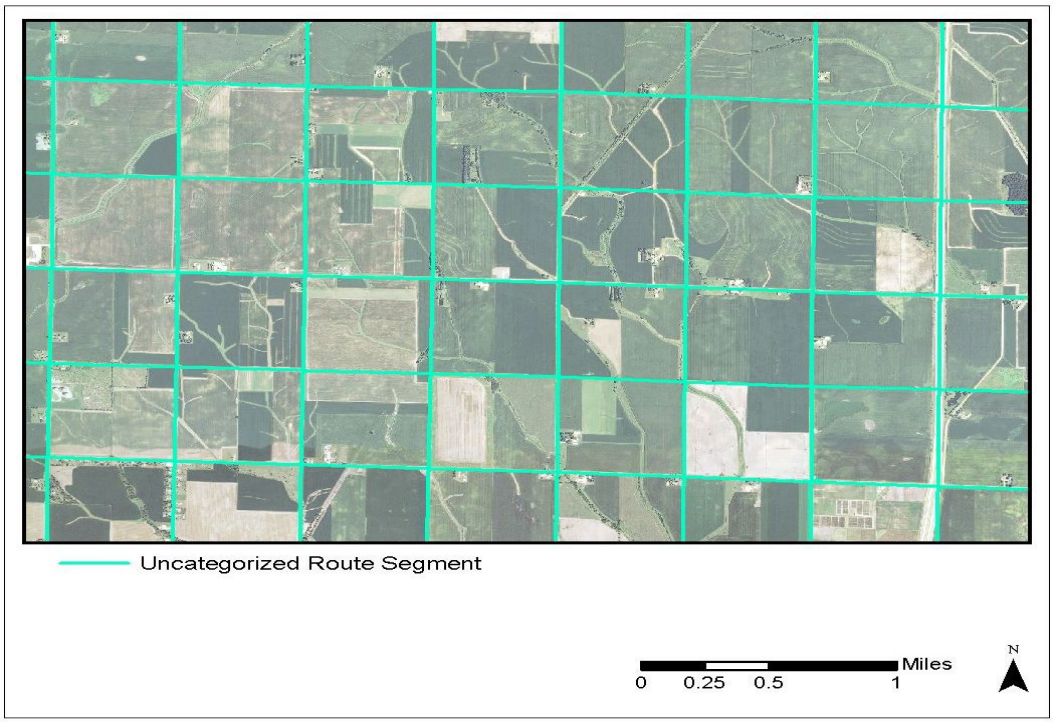
4.6 Route Segment Development

4.6.1 Network Development

The Applicant began Preliminary Route Alternative development by creating an extensive network by which potential route segments could be compared and evaluated. This process involved careful consideration of PUC's routing factors through the identification of roads, transmission lines, railroads, section lines, quarter-section lines, and general property boundaries within the Study Corridors. Opportunities that were oriented in a direction (that is, southwest to northeast) that conflicted with the Project direction, or that were located in a municipality, generally were excluded from the network. To the extent they were not excluded during the Study Corridor development, areas with a high concentration of Constraints, such as municipalities, were avoided during the network development. Where route segments intersected, a node was established.

Figure 4-4 illustrates route segment development in an agricultural setting, similar to what might be found in the western portion of the Study Corridors.

Figure 4-4. Route Segment Network Illustration



Because the Applicant identified minimization of impacts on people and their residences as a priority, the next step in the route segment development process was to identify all homes and structures (for example, barns, garages, sheds, and grain bins) within the Study Corridors. These two Constraints are widely distributed and common throughout most of the Study Area, and thus were difficult to avoid on a corridor scale.

Homes and structures initially were identified through field reviews, aerial image interpretation, and public comments. After the identification process was completed, the Applicant calculated the distance to the closest home and structure for each route segment and categorized the route segments by that distance. Figure 4-5 illustrates a route network with the segments categorized by home and structure distance intervals.

Using these measurements, the Applicant identified contiguous route segments that will maximize the distance from homes and other structures, while seeking to minimize the length and number of turns requiring angle structures.

Figure 4-5. Categorized Route Segment Network Illustration

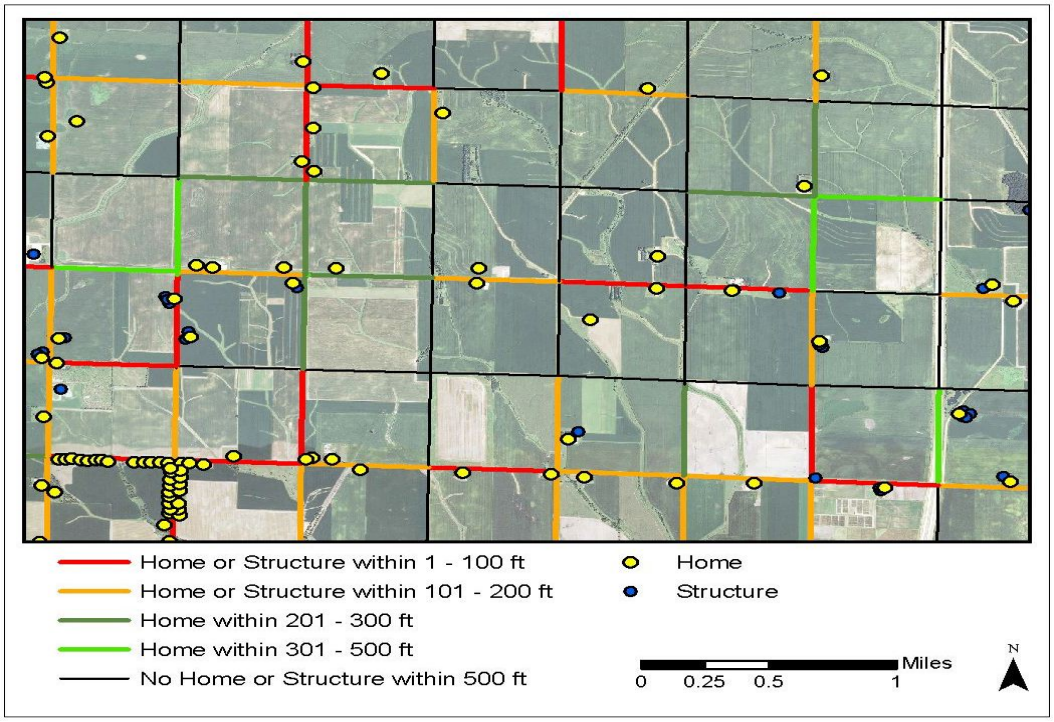
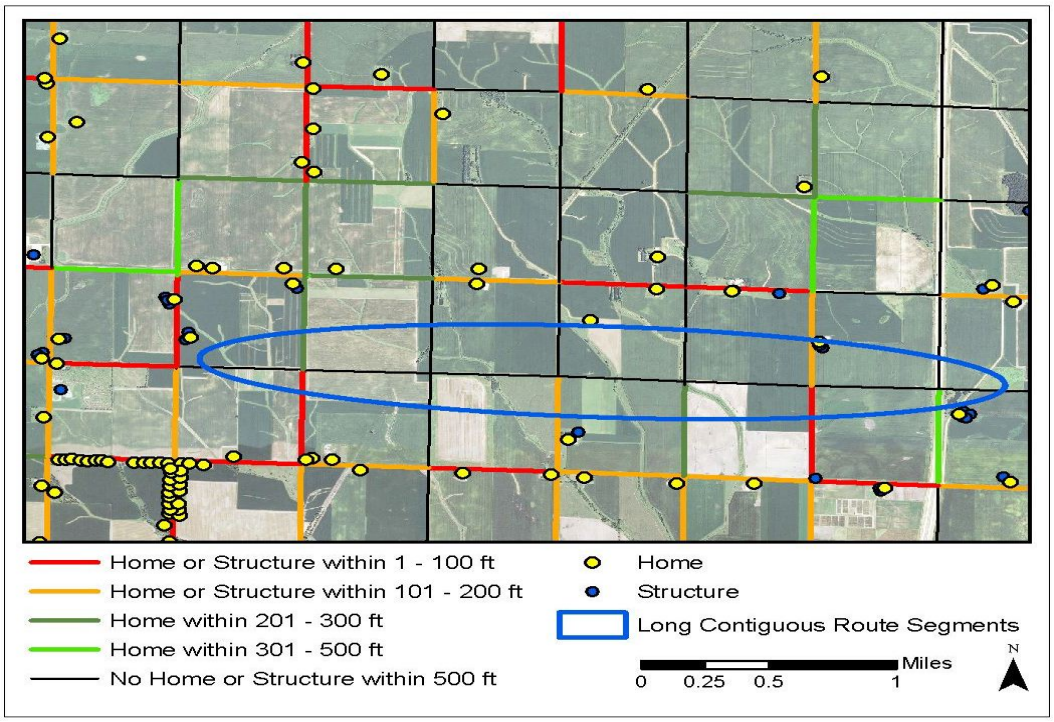


Figure 4-6 illustrates an example of contiguous route segments where a straight-line distance could be maximized.

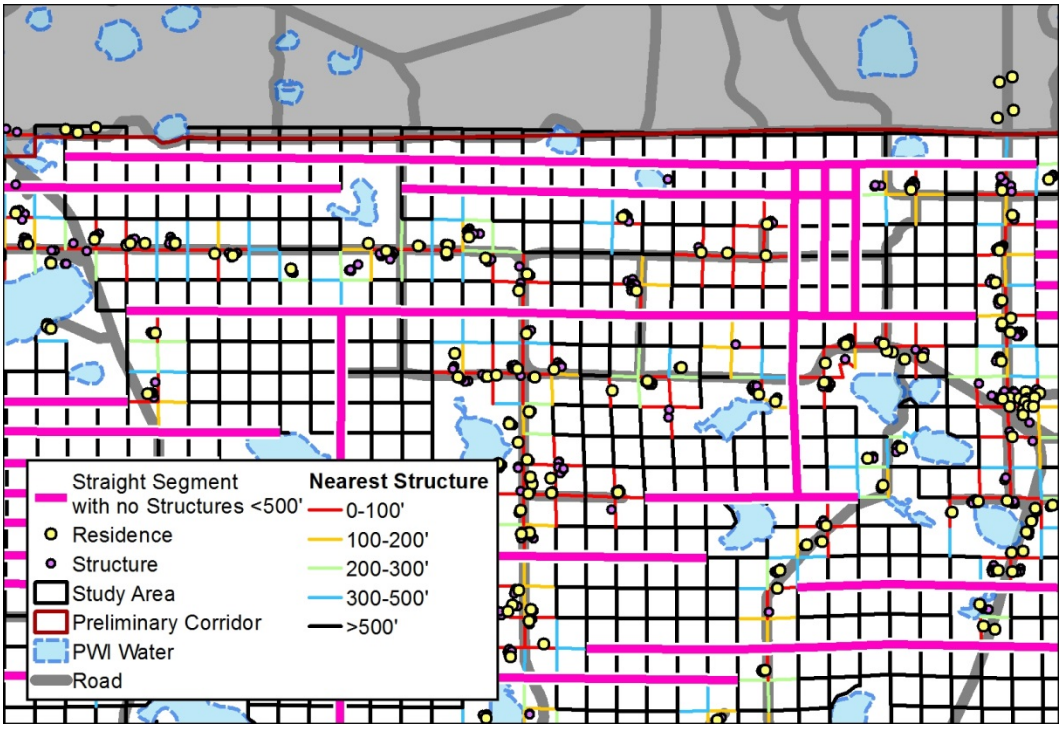
Figure 4-6. Long Contiguous Route Segment Illustration



The Applicant also prioritized quarter-section lines over quarter-quarter section lines because they more frequently coincide with property lines and field lines. Siting the Project along property lines or field lines helps minimize impacts on existing land uses.

The Applicant continued this process of identifying contiguous route segments until a network was identified that provided routing possibilities across the Study Corridors. Figure 4-7 illustrates an example of the network that was identified using the process described above. The network, which contained more than 600 route segments, was carried forward for further detailed analysis using all of the routing factors.

Figure 4-7. Network for Detailed Analysis Illustration

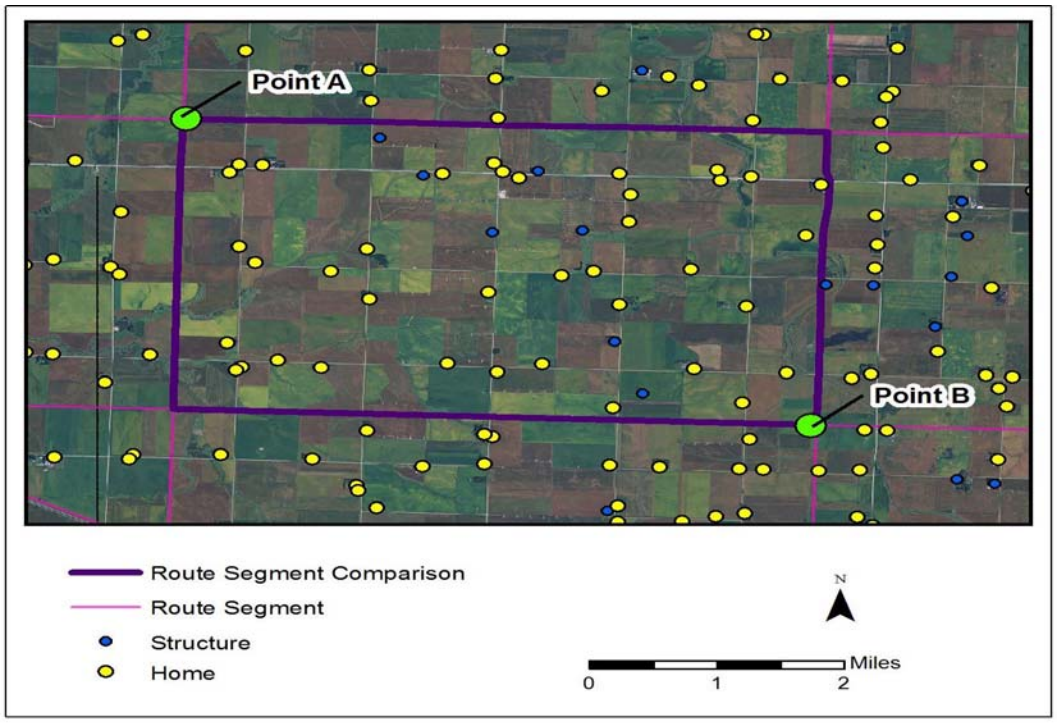


4.6.2 Route Segment Comparison

Once the network was developed, the Applicant analyzed the potential impacts associated with the route segments. The first step at this stage was to compare groups of smaller routes (contiguous route segments typically 3 to 10 miles long) that had common start and end points. Figure 4-8 provides an illustration of two route segments traversing from point A to point B that were comparatively analyzed with respect to potential impacts.

The route segments that best satisfied the routing factors in these comparisons were carried forward for further consideration. When all other factors were relatively equal, the Applicant generally gave preference to the route that had fewer homes in its proximity, lesser impact on wetlands, and was the shortest.

Figure 4-8. Route Segment Comparison Illustration



4.7 Preliminary Route Alternatives

The Applicant used the route segments it had developed to create Preliminary Route Alternatives from the Minnesota-Manitoba Border Crossing Area to the proposed Blackberry 500 kV Substation. These Preliminary Route Alternatives were approximately 1 to 3 miles wide and centered on identified route segments, as illustrated in Figure 4-9. Preliminary Route Alternatives wider than 1 mile were created to allow for additional flexibility when more than one route segment was feasible, or where the Applicant recognized potential conflict with planned development or land use Constraints.

Preliminary Route Alternatives were presented to the public at a second round of open house meetings and to individual agencies during the spring 2013. These meetings provided the public and agencies with updated information and facilitated the collection of comments for use in the next step of the route development process. See Figure 4-10 and Appendix C for a summary of public and agency comments.

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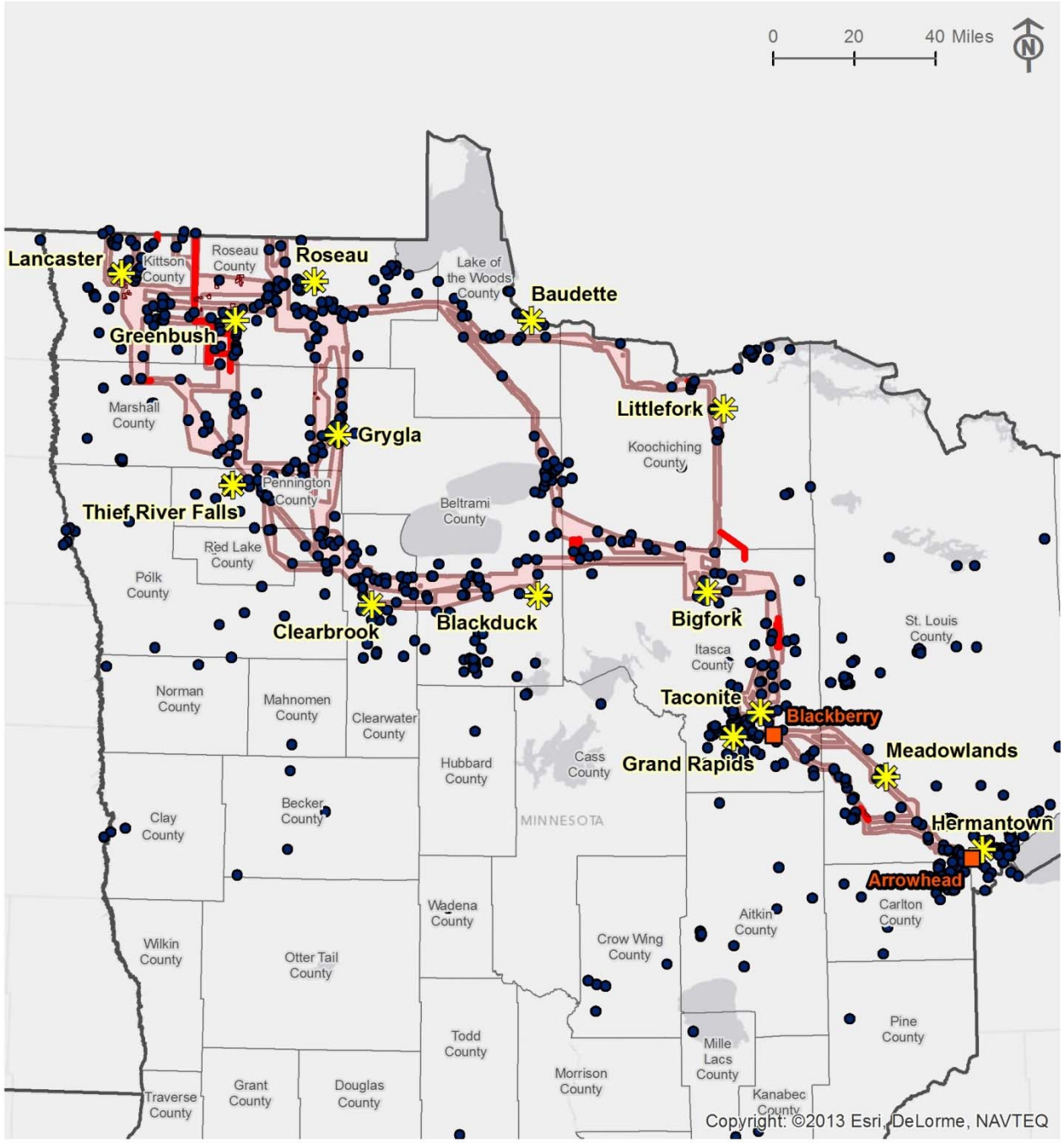
Preliminary Route Alternatives Figure 4-9



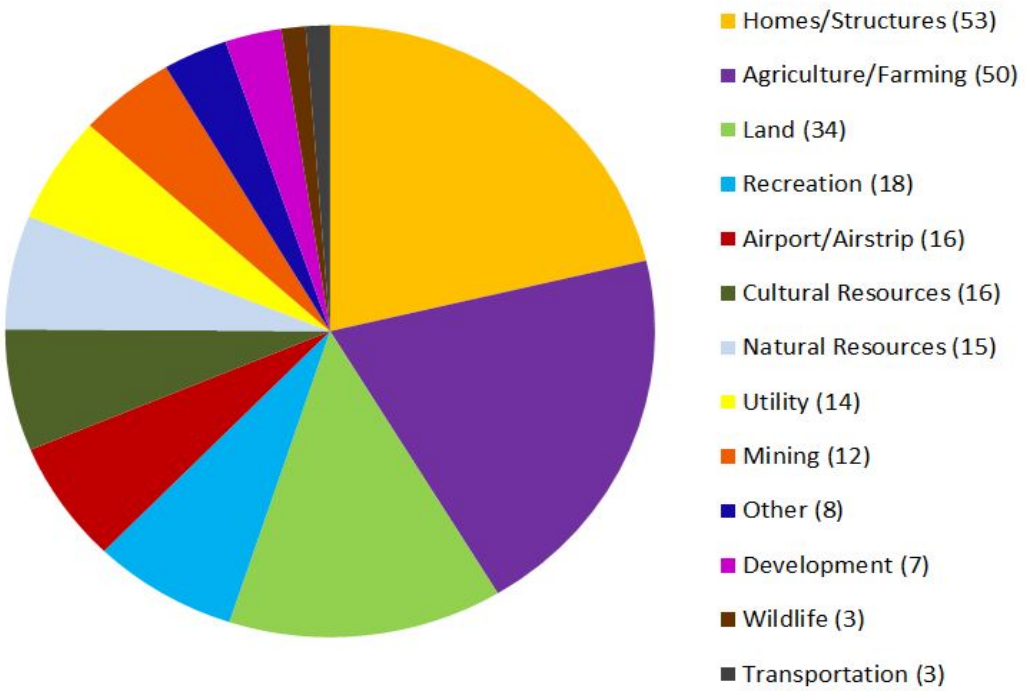
Legend

- Open House Location
- Substation
- Preliminary Route Alternatives
- State Boundary
- County Boundary
- Comment Point
- Area Comment
- Linear Comment

Sources: ESRI

\\mspe-gis-file\GISProjLarge\MinnPower\182035\map_docs\CLIENT\Route_Permit\04-09_PrelimRouteAlts.mxd

Figure 4-10. Spring 2013 Open House Meetings Comment Type and Number.



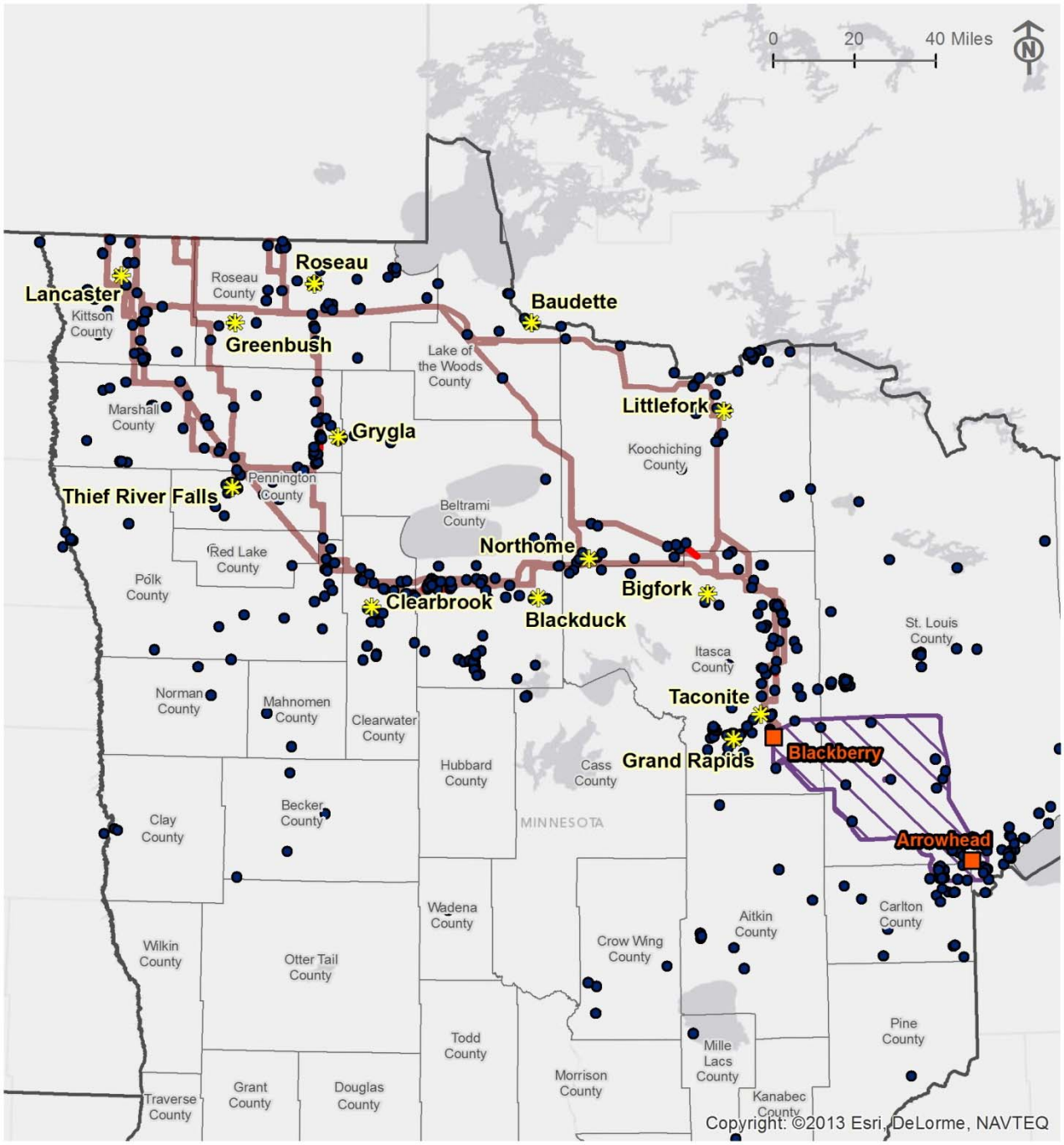
4.8 Refined Route Alternatives

Based on feedback from stakeholders and the public, as well as further analysis of the routing factors, the Applicant narrowed the Preliminary Route Alternatives to Refined Route Alternatives, each of which was 1,000 to 3,000 feet wide. Because these Refined Route Alternatives were closer in width to the actual ROW, the Applicant had to make additional decisions about minimizing impacts. At the same time, the Refined Route Alternatives maintained some flexibility with respect to the location of the centerline. The Refined Route Alternatives are shown in Figure 4-11.

The Refined Route Alternatives were presented to the public at a third round of open house meetings and to individual agencies in the fall 2013. Again, the Applicant used these meetings as an opportunity to both inform stakeholders about the Project and to gather information from the public and agencies for use in the route development process. See Figure 4-12 and Appendix C for a summary of public and agency comments.

At the beginning of project planning, Minnesota Power anticipated development of two transmission lines and associated facilities – the Project and a separate 345 kilovolt ("kV") transmission line between the terminus substation of the Project and the Arrowhead Substation near Hermantown, Minnesota. Subsequently, the Applicant determined that there are not sufficient transmission service requests to support this 345 kV transmission line. Therefore, the Applicant is not pursuing the 345 kV transmission line at this time.

Refined Route Alternatives Figure 4-11



Legend

- Open House Location
- Substation
- Refined Route Alternative
- Area Removed from Further Consideration
- Comment Point
- Linear Comment
- State Boundary
- County Boundary

Sources: ESRI

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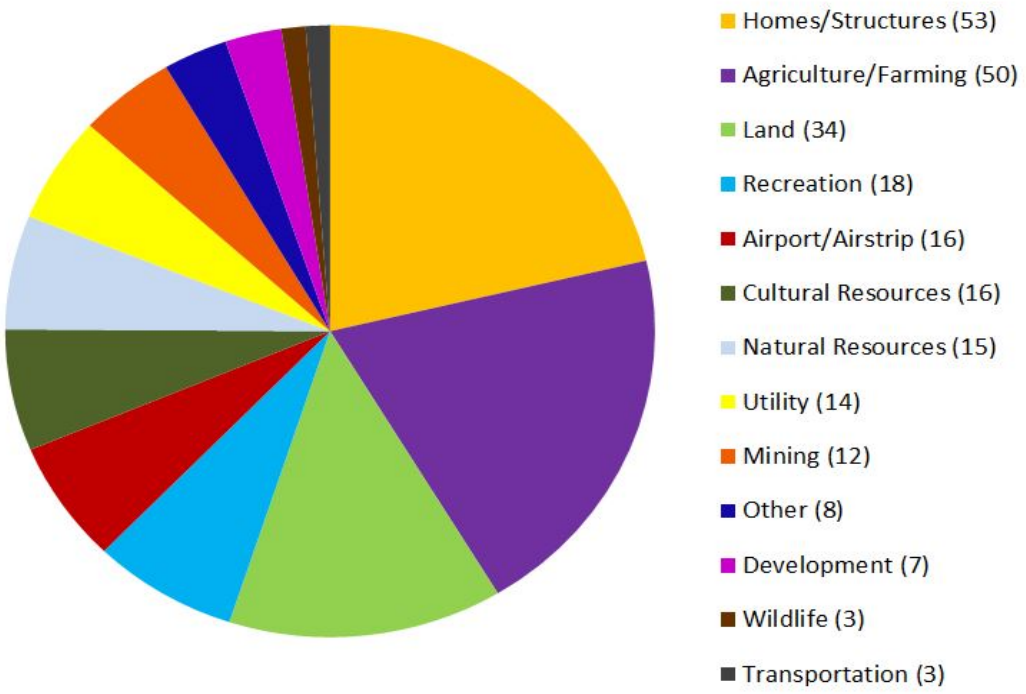
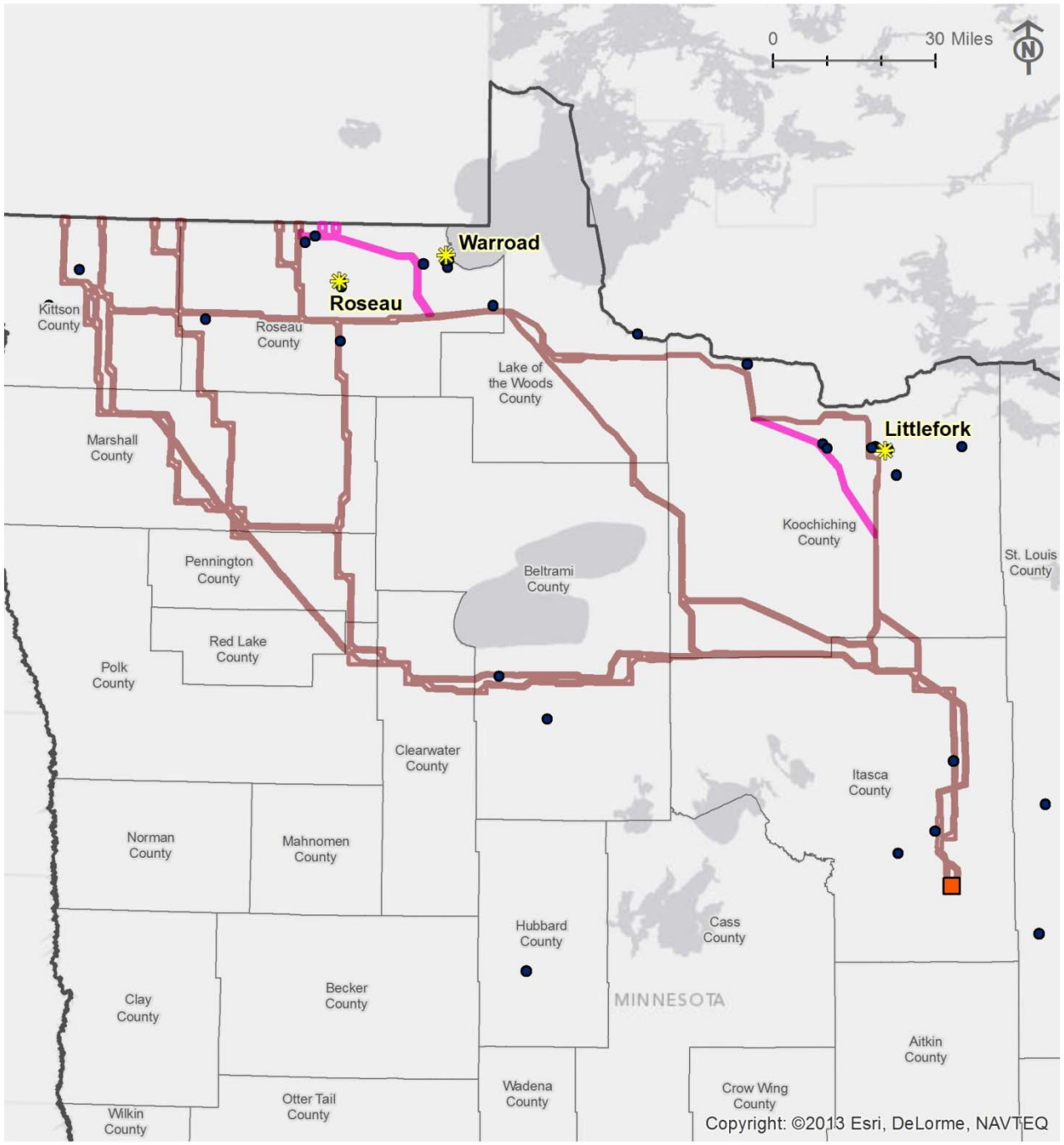
Figure 4-12. Fall 2013 Open House Meetings Comment Type and Number



4.9 Additional Route Segments

After further consideration of the comments received from the public and agencies during the third round of open house meetings, as well as further discussion about the application of the routing factors, the Applicant identified two additional route segments as potential routing options. The additional route segments, shown in Figure 4-13, were presented to the public during three open house meetings in November 2013. See Appendix C for a summary of public and agency comments.

Additional Route Segments Figure 4-13



Legend

- Open House Location
- Blackberry 500 kV Substation
- Additional Route Segments
- Refined Route Alternative
- Comment Point
- State Boundary
- County Boundary

Sources: ESRI

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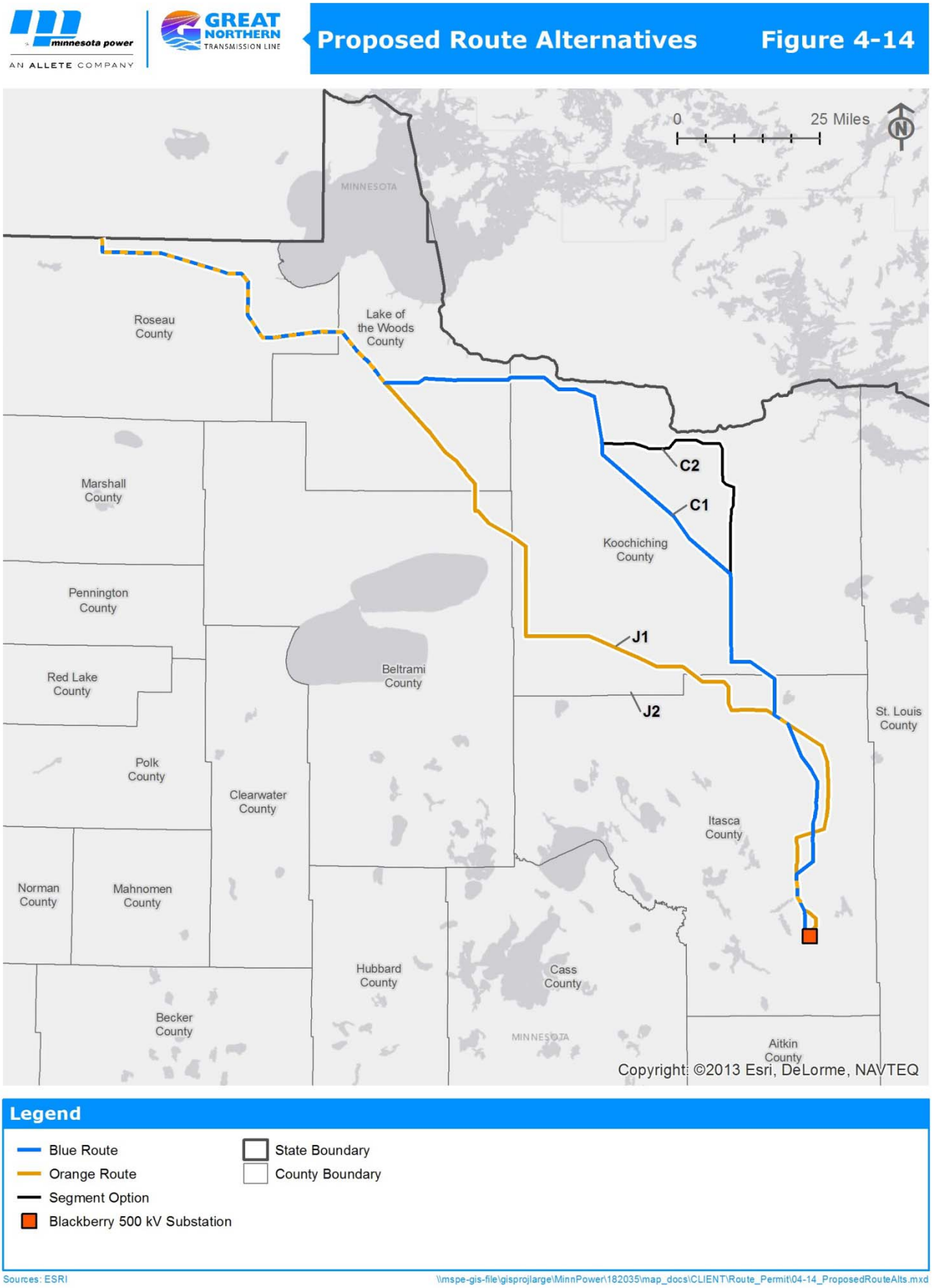
4.10 Proposed Route Alternatives and Segment Options

Under Minnesota Rules 7850.1900, the Applicant is required to propose at least two Route Alternatives for inclusion in its Application. These proposed Route Alternatives are shown in Figure 4-14. One Route Alternative, shown in orange in Figure 4-14, largely parallels an existing 500 kV transmission line. Another route alternative, shown in blue in Figure 4-14, largely parallels an existing 230 kV transmission line.

In addition to the Route Alternatives, the Project includes certain Segment Options that the Applicant proposes to carry forward into the permitting process. These Segment Options, which were identified as part of the route development process, would have different Project benefits and environmental effects.

- → Segment Option C1 is shorter, and goes through undeveloped forest, whereas Segment Option C2 is longer, and is closer to residences.
- → Segment Option J1 goes through undeveloped forest, whereas J2 is closer to residences. Segment Option J1 was suggested by the public during the open house meetings.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AN ALLETE COMPANY
GREAT NORTHERN TRANSMISSION LINE
Proposed Route Alternatives
Figure 4-14
0
25 Miles
N
MINNESOTA
Roseau County
Lake of the Woods County
Marshall County
Pennington County
Red Lake County
Polk County
Norman County
Mahnomen County
Clearwater County
Beltrami County
Koochiching County
Itasca County
St. Louis County
Hubbard County
Cass County
Aitkin County
Becker County
C2
C1
J1
J2
Copyright: ©2013 Esri, DeLorme, NAVTEQ
Legend
Blue Route
Orange Route
Segment Option
Blackberry 500 kV Substation
State Boundary
County Boundary
Sources: ESRI
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4.11 Alternatives Considered but Rejected

No Route Alternatives in the western portion of the Study Area (the Alternatives Considered but Rejected, shown in Figure 4-15) were included in the proposed Route Alternatives. As discussed in detail below, the Applicant considered numerous factors when selecting the two proposed Route Alternatives and eliminating the remaining Western Route Alternatives from further analysis.

4.11.1 Border Crossing Options

The Applicant included a number of potential locations for the Minnesota-Manitoba Border Crossing options in its Refined Route Alternatives. The Applicant recognizes that the location chosen must match the border crossing selected by Manitoba Hydro, which is conducting its own route development process (Minnesota Statutes Section 216E.02, subdivision 3). As Manitoba Hydro's process moved forward, the Applicant and Manitoba Hydro jointly agreed to eliminate the westernmost Border Crossing Area because it was less desirable in a number of respects, including effects on human settlement and the environment, than other Border Crossing Options. Because the westernmost Border Crossing option was eliminated by agreement with Manitoba Hydro, the Applicant also eliminated the most westerly route alternative that was exclusively associated with that Border Crossing Area from further consideration.

4.11.2 Existing Transmission Lines

When PUC issues route permits for high-voltage transmission lines like the Project, it favors routes that parallel existing transmission line ROWs. The Western Route Alternatives did not offer an opportunity to parallel existing high-voltage transmission lines. This factor favored selection of the Orange Route and Blue Route, which do parallel existing transmission lines, over the other Refined Route Alternatives.

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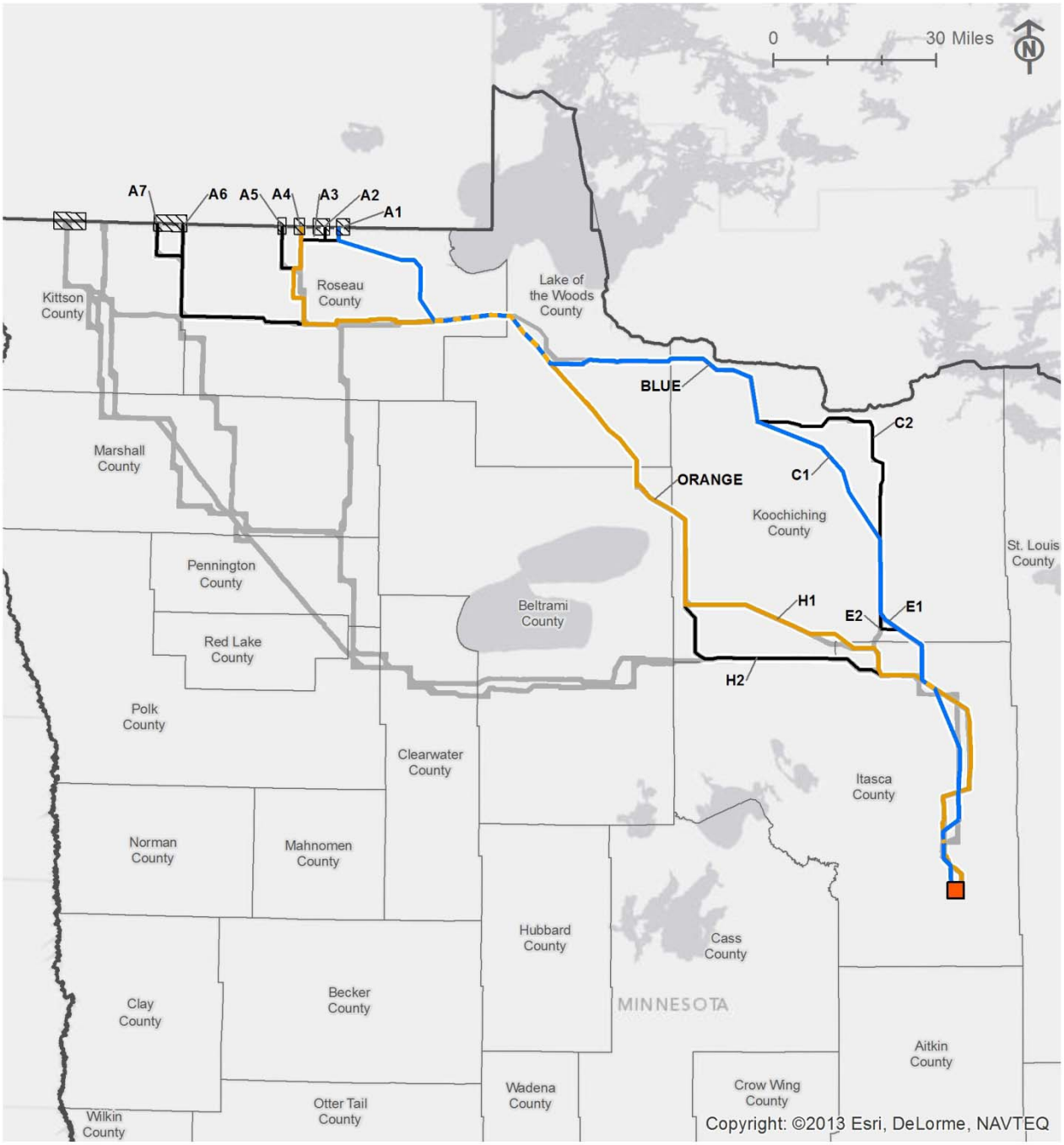
Alternatives Considered but Rejected

Figure 4-15



Legend

- Blue Route
- Orange Route
- Segment Option
- Blackberry 500 kV Substation
- Border Crossing Area
- Alternatives Considered but Rejected
- State Boundary
- County Boundary

Sources: ESRI

\\mspe-gis-file\gisprojlarge\MinnPower\182035\map_docs\CLIENT\Route_Permit\04-15_Rejected.mxd

4.11.3 Energy Demand and Power Purchase Agreements

The statement of purpose and need for the Project establishes that the regional demand for electricity is expected to grow significantly in the coming years. PUC has concluded that the Applicant faces an energy and capacity deficit from 2020–2035. To meet this need, the Applicant and Manitoba Hydro have signed a 250 megawatt (MW) Power Purchase Agreement (PPA) and a 133 MW Energy Sale Agreement. To fulfill these agreements, the Project must be in service by June 1, 2020.

The Applicant evaluated the likelihood of successfully achieving the June 1, 2020 in service date with each of the Refined Route Alternatives. This involved careful analysis of feedback received during public open house meetings; calculation of the estimated time it will take to acquire the necessary property rights and construct the transmission line; and consideration of the potential need for condemnation proceedings, including the unique aspects of Minnesota condemnation law. Because the Western Route Alternatives would involve a substantially larger number of privately owned parcels, many of which are used for agricultural purposes, and because public meeting attendees at the Western Route Alternative sites voiced more numerous and strenuous objections, the Applicant concluded that achieving the contractually determined June 1, 2020 in-service date will be highly unlikely for the Western Route Alternatives. For this reason, the Western Route Alternatives do not satisfy the purpose and need for the Project.

4.11.4 Community Impacts

The comments received at the public meetings for the Western Route Alternatives indicated to the Applicant that there is a substantial level of public opposition to siting the Project in the western portion of the Study Area. (See previous discussion in this chapter, Section 9.0, Public Participation and Agency Coordination, and Appendix C.) This opposition is attributable to the higher concentration of residences in the area and the concentration of agricultural land users, who object to the potential for diminished production capacity of their land. The fact that the Western Route Alternatives were much further removed from the Applicant's service area than the Orange Route and the Blue Route was also a source of objections. The Applicant's purpose and need for the Project includes the company's goal of having a positive impact on communities. The Applicant concluded, on the basis of comments it received during public open house meetings that adopting the Western Route Alternatives will threaten this goal. For this additional reason, the Western Route Alternatives do not satisfy the purpose and need for the Project.

4.12 Border Crossing Options

At the outset of the Project, the Applicant and Manitoba Hydro agreed to describe border crossing considerations related to length, impact on people, the environment and agency and community feedback, as well as schedule, and had exchanged information on their respective regulatory and routing processes. The Applicant and Manitoba Hydro then completed separate routing and public engagement processes to determine their unique preferences related to border crossing locations. On March 3, 2014 the Applicant met with Manitoba Hydro to discuss their respective border crossing preferences, with the objective of determining a mutually

acceptable border crossing location that would serve the needs of the overall project. Figure 4-15 illustrates the crossing locations considered (A1 – A7).

Applicant Considerations and Preference

Key border crossing considerations for the Applicant are consistent with those described elsewhere in this Application, including minimizing length; avoiding potential impacts on residences, and productive agricultural land; and accounting for environmental concerns. Based on these considerations, the Applicant identified Option A1 as its preferred option because it results in routes that are shorter, impact fewer homes and less agricultural land, and allows more collocation with existing transmission lines. The Applicant considered Options A7 and A6 infeasible because they would affect many more homes and productive farmland, while at the same time creating many miles of new corridor. The area that would be affected by Options A7 and A6 has also been recognized as having outstanding biological diversity, a concern echoed in communications received from the Nature Conservancy.

Manitoba Hydro Considerations and Preference

Key border crossing considerations for Manitoba Hydro included determining route options that balance natural, engineering and built considerations while taking into consideration feedback from the public, stakeholders and aboriginal communities. Manitoba Hydro identified Option A7 as the best option based on all criteria considered. Options A1 and A2 were not feasible as they traverse areas of high biological diversity in Manitoba that have been noted by agencies and environmental non-governmental organizations and are primarily located through Crown lands, which have been criticized as a routing approach by the Clean Environment Commission. Additionally, Options A1 and A2 could raise significant concerns from First Nation communities in terms of traditional uses of the area.

Decision Process

Discussion during the March 3 meeting recognized that both parties had similar concerns regarding avoiding and/or reducing potential impacts on people and natural areas. Both utilities also understood the importance of considering risk, schedule and potential delays.

Since Options A6 and A7 were infeasible in Minnesota Power's perspective and Options A1 and A2 were infeasible in Manitoba Hydro's perspective, these crossings were removed from further consideration. Additionally, Manitoba Hydro preferred the most western crossing (Option A5) over the east crossing (Option A3/A4), since access to the east crossing (Option A3/A4) would require the selection of a route that was more environmentally impactful. Therefore, Manitoba Hydro and Minnesota Power agreed that Option A5 was the best and only feasible Border Crossing Option taking into account acceptability to parties, environmental impacts, community impacts and overall Project schedule (Minnesota Statutes Section 216E.02, subdivision 3).

As a result of the border crossing decision, the Applicant revised the Orange Route and Blue Route so that they both ended at the selected crossing location (see Figure 1-1 in Section 1.0, Introduction).

4.13 Segment Options E1 and E2

Segment Options E1 and E2 were originally identified as potential segments based on opportunities to follow existing infrastructure. Segment Option E1 follows 230 kV and 500 kV transmission lines. Segment Option E2 follows a portion of Deer River Line Road. Upon further analysis, Segment Option E1 was rejected because it parallels two high voltage transmission lines and would result in multiple stream crossings. While paralleling an existing transmission line generally presents a routing opportunity, there is also some risk that a single incident could affect service on both lines. The Applicant took that reliability risk into account when identifying transmission line paralleling opportunities. Paralleling two different high-voltage transmission lines, however, increases the reliability risk to the point that it outweighs the potential routing opportunity. Segment Option E1 accordingly was eliminated from further consideration, and Segment Option E2 was carried forward as part of the Blue Route.

4.14 Applicant's Preferred Route

Per Minnesota Rule 7850.1900 Subpart 2 C, the Applicant is required to identify their preferred route. In identification of the preferred route, the Applicant considered all of the information collected to date, including public and agency comments and the environmental data analyzed in this Application. Based on this review, the Applicant prefers the Blue Route.