

Appendices

Appendix A

Scoping Decision



In the Matter of the Certificate of Need and
Route Permit Applications of Xcel Energy
and ITC Midwest LLC for the Huntley to
Wilmarth 345 kV Transmission Line Project
in South Central Minnesota

**ENVIRONMENTAL IMPACT STATEMENT
SCOPING DECISION**

**DOCKET NO. E002, ET6675/CN-17-184
DOCKET NO. E002, ET6675/TL-17-185**

The above matter has come before the deputy commissioner of the Department of Commerce (Department) for a decision on the scope of the environmental impact statement (EIS) to be prepared for the Huntley to Wilmarth 345 kV transmission line project proposed by Xcel Energy and ITC Midwest LLC (applicants) in south central Minnesota.

Project Description

The applicants propose to construct approximately 50 miles of new 345 kV transmission line from the Wilmarth substation in Mankato, Minnesota to the Huntley substation near Winnebago, Minnesota. The project includes equipment additions and reconfigurations within the Wilmarth and Huntley substations to connect the new 345 kV line. Transmission line structures will range from 75 to 170 feet in height, with a span between structures of approximately 1,000 feet.

The applicants are requesting a 1,000 foot route width for project; they indicate that the new 345 kV line will require a right-of-way (easement) of 150 feet. The applicants have proposed four possible routes for the project and six route segment alternatives. The routes are designated by color – purple, green, red, and blue; the route segment alternatives are designated by letters – segments A through F. The applicants anticipate that project construction will begin in 2020 and that the new line will be in service by the end of 2021.

Project Purpose

The applicants indicate that the proposed project is needed to relieve transmission congestion in southern Minnesota and northern Iowa. Applicants suggest that relieving this congestion will increase market access to lower cost energy generation, provide economic benefits, strengthen the regional grid, and reduce curtailments of wind generators. The project was studied by the Midcontinent Independent Transmission System Operator (MISO) and approved by MISO as a market efficiency project in December 2016.

Regulatory Background

The applicants' proposed project requires two separate approvals from the Minnesota Public Utilities Commission (Commission) – a certificate of need (CN) and route permit. A certificate of need application for the project was submitted to the Commission on January 17, 2018, and accepted as complete by the Commission on March 28, 2018. A route permit application was submitted to the Commission on January 22, 2018. The applicants subsequently revised the

alignment and route width for a section of a route in their application, the blue route.¹ The route permit application was accepted as complete on March 28, 2018.

Department of Commerce, Energy Environmental Review and Analysis (EERA) staff is responsible for conducting environmental review for CN and route permit applications submitted to the Commission.² As two concurrent environmental reviews are required – one for the CN application and one for the route permit application – the Commission has authorized EERA staff to combine the environmental review for the two applications.³ An environmental impact statement (EIS) will be prepared to meet the requirements of both review processes.

Scoping Process

Scoping is the first step in the development of the EIS for the project. The scoping process has two primary purposes: (1) to gather public input as to the impacts, mitigation measures, and alternatives to study in the EIS, and (2) to focus the EIS on those impacts, mitigation measures, and alternatives that will aid in the Commission's decisions on the CN and route permit applications.

EERA staff gathered input on the scope of the EIS through four public meetings and an associated comment period. EERA staff also facilitated input on the scope of the EIS through an advisory task force. This scoping decision identifies the impacts and mitigation measures that will be analyzed in the EIS, including routing alternatives for the project. Additionally, this scoping decision identifies alternatives to the project itself that will be analyzed in the EIS.

Public Scoping Meetings

Commission and EERA staff held joint public information and environmental impact statement scoping meetings on April 17, 2018, in the city of Mankato and on May 9, 2018, in the cities of Winnebago and Mapleton. Total attendance at these meetings was approximately 440 persons. Comments were received from 85 persons at these meetings.⁴ Commenters expressed concern about a variety of potential impacts associated with the project, including impacts to agriculture, property values, and communities.

Public Comments

A comment period, ending on May 18, 2018, provided the public an opportunity to submit comments to EERA staff on potential impacts and mitigation measures for consideration in the scope of the EIS. Comments were received from two agencies,⁵ four local units of government,⁶ the

¹ Applicants' Letter to the Commission Regarding Alignment of the Blue Route, March 16, 2018, eDockets Number [20183-141145-01](#).

² Minnesota Rule 7849.1200; Minnesota Rule 7850.2500.

³ Commission Order Finding Applications Complete and Notice of and Order for Hearing, March 28, 2018, eDockets Number [20183-141450-01](#).

⁴ Oral Comments from Public Information and EIS Scoping Meetings, eDockets Number [20185-143325-07](#) [hereinafter Oral Comments].

⁵ Written Agency Comments on Scope of EIS, eDockets Number [20185-143325-01](#) [hereinafter Agency Comments].

⁶ Written Local Government Comments on Scope of EIS, eDockets Number [20185-143325-05](#) [hereinafter LGU Comments].

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applicants,⁷ and from 80 citizens.⁸ Several of these comments included specific route or alignment alternatives for consideration in the EIS. Approximately one-half of citizen commenters expressed a preference for, or displeasure with, a routing option proposed in the route permit application.

Agency Comments

The Minnesota Department of Transportation (MnDOT) noted its accommodation policy for the placement of utilities along highway rights-of-way.⁹ MnDOT also indicated that the EIS for the project should consider future improvements to the highway system in the project area.

The MnDOT Division of Aeronautics noted that the applicants' proposed blue route for the project is within an airport safety zone – zone C – for the Mankato Regional airport.¹⁰ Within this safety zone there are certain land use restrictions. The MnDOT Division of Aeronautics indicated the types of approval that would be needed in order for the blue route to be constructed within zone C.

The Minnesota Department of Natural Resources (DNR) noted a number of potential natural resource impacts that should be analyzed in the EIS.¹¹ The DNR provided comments on specific routes and route segments proposed in the applicants' route permit application. They indicated that route segment C was inconsistent with Minnesota Rule 7850.4300 and should not be carried forward for study in the EIS.¹² The DNR also proposed two route segments near the Watonwan River for consideration in the EIS (route segments J and K).¹³

Comments from Local Units of Government

The city of Mankato noted a number of potential human and environmental impacts associated with the proposed blue route.¹⁴ The city described potential impacts to infrastructure investments and planned community development that should be analyzed in the EIS.¹⁵ The city also noted potential impacts to the Mankato Regional airport.

The city of North Mankato noted potential impacts to the city's comprehensive plan and future growth – particularly with respect to the proposed red and green routes and route segments A, B, and C.¹⁶ The city also noted potential impacts to residences, property values, and the city's tax base.¹⁷

⁷ Applicants' Comments on Scope of EIS, eDockets Number [20185-143325-03](#) [hereinafter Applicants' Comments].

⁸ Written Public Comments on Scope of EIS, eDockets Numbers [20185-143325-09](#), [20185-143325-11](#) [hereinafter Written Public Comments].

⁹ Comment Letter of Minnesota Department of Transportation, Agency Comments.

¹⁰ Comment Letter of Minnesota Department of Transportation, Division of Aeronautics, Agency Comments.

¹¹ Comment Letter of Minnesota Department of Natural Resources, Agency Comments.

¹² Id.

¹³ Id.

¹⁴ Comment Letter of the City of Mankato, LGU Comments.

¹⁵ Id.

¹⁶ Comment Letter of the City of North Mankato, LGU Comments.

¹⁷ Id.

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Nicollet County indicated potential impacts associated with the proposed red and green routes and route segments A, B, and C – including impacts to the city of North Mankato, impacts to scenic resources such as Minnemishinona Falls Park, and impacts to farmland.¹⁸

Blue Earth County noted that proposed route segment C has the potential to impact the Williams Nature Center Park.¹⁹

Applicants' Comments

The applicants proposed four route segments for study in the EIS.²⁰ The applicants proposed a route segment, along the purple route, to avoid a land parcel (Pheasants Forever parcel) that is in the process of being transferred to federal ownership as a waterfowl production area (route segment L).²¹ The applicants proposed two route segments along existing transmission lines that facilitate reaching the Huntley substation from the green, red, and blue routes (route segments Q and R).²² The applicants also proposed a variation on route segment E that could minimize impacts to residences (route segment E2).²³

Advisory Task Force

The Commission authorized an advisory task force to aid development of the scope of the EIS.²⁴ The task force identified several potential impacts and mitigation measures for consideration in the EIS.²⁵ The task force proposed one route segment (route segment G) and one combination of existing routing options (purple-E-red route) for study in the EIS.²⁶

Alternatives to the Project

Two citizens suggested that the applicants' proposed project is undersized and that the EIS should consider the possibility of using a 500 kV line instead of a 345 kV line.²⁷ One citizen suggested the existing 161 kV line in the area be updated to meet the need for the project.²⁸ One citizen suggested that the need for the project could be met by reconductoring and double-circuiting the existing Lakefield to Wilmarth 345 kV line.²⁹ This citizen also suggested that the need for the project could be met by closing existing coal-fired power plants in neighboring states.³⁰

¹⁸ Comment Letter of Nicollet County, LGU Comments.

¹⁹ Comment Letter of Blue Earth County, Public Works Department, LGU Comments.

²⁰ Applicants' Comments.

²¹ Id.

²² Id.

²³ Id.

²⁴ Commission Order Finding Applications Complete and Notice of and Order for Hearing, March 28, 2018, eDockets Number [20183-141450-01](#).

²⁵ Huntley to Wilmarth 345 kilovolt (kV) Transmission Line Advisory Task Force Report, May 2018, eDockets Number [20186-143530-01](#).

²⁶ Id.

²⁷ Comment Letter of Mr. Jason McMonagle, Written Public Comments; Oral Comments of Mr. Dennis Mikkelsen, Mankato Public Meeting 6 p.m., Oral Comments.

²⁸ Comment Letter of Ms. Sharon Schaller, Written Public Comments.

²⁹ Comment Letter of Ms. Carol Overland, Written Public Comments.

³⁰ Id.

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Commission Review

After close of the public comment period, EERA staff conferred with DNR staff and the applicants on the alternatives proposed for study in the EIS. On June 19, 2018, EERA staff provided the Commission with a summary of the EIS scoping process.³¹ The summary discussed the routing alternatives that were proposed during the scoping process and those alternatives that the Department intended to recommend for inclusion in the scope of the EIS. On July 12, 2018, the Commission considered what action it should take with respect to the routing alternatives to be considered in the EIS. The Commission adopted EERA staff's recommendations and proposed an additional route segment for study in the EIS (route segment Y).³²

HAVING REVIEWED THE MATTER, consulted with Department staff, and in accordance with Minnesota Rule 7850.2500, I hereby make the following scoping decision:

MATTERS TO BE ADDRESSED

The issues outlined below will be analyzed in the EIS for the proposed Huntley to Wilmarth 345 kV transmission line project. The EIS will describe the project and the human and environmental resources of the project area. It will provide information on the potential impacts of the project as they relate to the topics outlined in this scoping decision and possible mitigation measures. It will identify impacts that cannot be avoided and irretrievable commitments of resources, as well as permits from other government entities that may be required for the project. The EIS will discuss the relative merits of the route alternatives studied in the EIS using the routing factors found in Minnesota Rule 7850.4100.

The EIS will include a description and analysis of the human and environmental impacts of the proposed project and alternatives to the project that would have otherwise been required by Minnesota Rule 7849.1500 in an environmental report.

I. GENERAL DESCRIPTION OF THE PROJECT

- A. Project Description
- B. Project Purpose
- C. Route Description
 - 1. Route Width
 - 2. Right-of-Way
- D. Project Costs

³¹ Department of Commerce, Comments and Recommendations on Scoping Process and Routing Alternatives, July 19, 2018, eDockets Number [20186-143985-01](#) [hereinafter Department Comments and Recommendations].

³² Commission Order, July 17, 2018, eDockets Numbers [20187-144956-01](#) and [20187-144956-02](#).

II. REGULATORY FRAMEWORK

- A. Certificate of Need
- B. High Voltage Transmission Line Route Permit
- C. Environmental Review Process
- D. Other Permits and Approvals

III. ENGINEERING AND DESIGN

- A. Transmission Line Structures
 - 1. Paralleling and Double-Circuiting
- B. Transmission Line Conductors

IV. CONSTRUCTION

- A. Right-of-Way Acquisition
- B. Construction
- C. Restoration
- D. Damage Compensation
- E. Operation and Maintenance

V. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS, AND MITIGATIVE MEASURES

The EIS will include a discussion of the human and environmental resources potentially impacted by the proposed project and the routing alternatives described herein (Section VI). Potential impacts, both positive and negative, of the project and each alternative will be described. Based on the impacts identified, the EIS will describe mitigation measures that could reasonably be implemented to reduce or eliminate the identified impacts. The EIS will describe any unavoidable impacts resulting from implementation of the proposed project.

Data and analyses in the EIS will be commensurate with the importance of potential impacts and the relevance of the information to consideration of the need for mitigation measures.³³ EERA staff will consider the relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the EIS. Less important material may be summarized, consolidated, or simply referenced.

If relevant information cannot be obtained within timelines prescribed by statute and rule, or if the costs of obtaining such information is excessive, or the means to obtain it is not known, EERA staff will include in the EIS a statement that such information is incomplete or unavailable and the relevance of the information in evaluating potential impacts.³⁴

- A. Environmental Setting
- B. Socioeconomics
- C. Human Settlements
 - 1. Noise
 - 2. Aesthetics

³³ Minnesota Rule 4410.2300.

³⁴ Minnesota Rule 4410.2500.

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- 3. Displacement
- 4. Property Values
- 5. Zoning and Land Use Compatibility
- 6. Public Services
 - a) Roads and Highways
 - b) Utilities
 - c) Emergency Services
- 7. Electronic Interference
 - a) Radio
 - b) Television
 - c) Wireless Phone / Internet Services
- D. Public Health and Safety
 - 1. Electric and Magnetic Fields
 - 2. Implantable Medical Devices
 - 3. Stray Voltage
 - 4. Induced Voltage
 - 5. Air Quality
- E. Land Based Economies
 - 1. Agriculture
 - a) Compaction
 - b) Tile Damage
 - c) Aerial Spraying
 - d) GPS Systems
 - 2. Forestry
 - 3. Mining
 - 4. Recreation and Tourism
- F. Archaeological and Historic Resources
- G. Natural Environment
 - 1. Water Resources
 - a) Surface Waters
 - b) Groundwater
 - c) Wetlands
 - 2. Soils
 - 3. Flora
 - 4. Fauna
- H. Threatened / Endangered / Rare and Unique Natural Resources
- I. Electric System Reliability
- J. Operation and Maintenance Costs that are Design Dependent
- K. Adverse Impacts that Cannot be Avoided
- L. Irreversible and Irretrievable Commitments of Resources

VI. ROUTES AND ROUTE ALTERNATIVES TO BE EVALUATED IN THE ENVIRONMENTAL IMPACT STATEMENT

The EIS will evaluate the routes and route segments proposed in the applicants' route permit application except for route segment C (see attached maps, Map 1). The DNR has indicated that route segment C is inconsistent with Minnesota Rule 7850.4300 and is not permittable. Accordingly, the EIS will evaluate the purple, green, red, and blue routes, and the route segments A, B, D, E, and F.

In addition, the following routes, route segments, and alignment alternatives will be evaluated in the EIS:

Purple-E-Red Route

The purple-E-red route is a combination of the applicants' purple and red routes, as connected by the applicants' route segment E (Map 2). The purple-E-red route utilizes those portions of the purple and red routes that follow existing transmission lines, and minimizes the extent of the route that does not (route segment E).

Route Segment E2

This route segment is an alternative version of route segment E that connects with the red and green routes at a more northern location, relative to route segment E (Map 3).

Route Segment G

Route segment G proceeds along County Road 86 on the eastern edge of the city of Mankato (Map 4). The segment provides an alternative to the blue route near the Eastwood solar farm.

Route Segment H

Route segment H proceeds around the western edge of the Pheasants Forever parcel, following an existing 345 kV line, and then proceeds east and south, crossing the Watonwan River along County Road 32, and then rejoins the purple route (Map 5). This segment provides an alternative to the purple route near the Watonwan River.

Route Segment I

Route segment I is a short corner segment that avoids a diagonal crossing of the Pheasants Forever parcel by the purple route (Map 5).

Route Segment J

Route segment J proceeds south from the purple route, parallels and then crosses the Watonwan River, and then rejoins the purple route. This segment provides an alternative to the purple route near the Watonwan River (Map 5).

Route Segment K

Route segment K proceeds south from the purple route, crosses the Watonwan River along County Road 32, and then rejoins the purple route (Map 5). This segment provides an alternative to the purple route near the Watonwan River.

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Route Segment L

Route segment L proceeds eastward from the purple route, around existing waterfowl production areas, and then southward across the Watonwan River to rejoin the purple route (Map 5). This segment provides an alternative to the purple route near the Watonwan River.

Route Segment M

This route segment is similar to route segment L; however, it proceeds further eastward before turning south across the Watonwan River (Map 5).

Route Segment N

Route segment N provides an alternative to a southern section of the purple route by following existing roads and a drainage ditch and buffer strip (Map 6).

Route Segment O

Route segment O provides an alternative to a section of the green route by following Faribault County Road 107 (Map 7).

Route Segment P

Route segment P provides an alternative to a southern section of the blue route (Map 8). Route segment P turns west from the blue route and then south along field lines before rejoining the blue route.

Route Segment Q

Route segment Q follows an existing 161 kV transmission line and provides an alternative to the red and blue routes east of the Huntley substation (Map 9).

Route Segment R

Route segment R follows an existing 161 kV transmission line and provides an alternative to the red route east of the Huntley substation (Map 9).

Route Segment Y

Route segment Y provides an alternative to a section of the red route by following an existing 161 kV transmission line (Map 10).

Alignment Alternative 1 (AA-1)

This alignment alternative proceeds along the south side of U.S. Highway 169, rather than the north side, for a portion of route segment E (Map 11).

Alignment Alternative 2 (AA-2)

This alignment proceeds along a property boundary, rather than through a property, for a portion of the blue route (Map 12).

Alignment Alternative 3 (AA-3)

This alignment consists of two options: (1) triple-circuiting a portion of the purple route west of the Huntley substation, and (2) proceeding along the south side of 160th St., rather than the north, for a portion of purple route west of the Huntley substation (Map 13).

VII. ALTERNATIVES TO THE PROPOSED TRANSMISSION LINE PROJECT

The EIS, in accordance with Minnesota Rule 7849.1500, will describe and analyze the feasibility of the following system alternatives, and the human and environmental impacts and potential mitigation measures associated with each:

- A. No-build Alternative
- B. Demand Side Management
- C. Purchased Power
- D. Transmission Line of a Different Size
 - 1. Higher and Lower Voltage Lines
- E. Upgrading of Existing Facilities
 - 1. Reconductoring of Existing Lines
 - 2. Double-Circuiting of Existing Lines
- F. Generation Rather Than Transmission
- G. Use of Renewable Energy Sources

VIII. IDENTIFICATION OF PERMITS

The EIS will include a list and description of permits from other government entities that may be required for the proposed project.

ISSUES OUTSIDE THE SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

The EIS will not consider the following:

- A. Any route, route segment, or alignment alternative not specifically identified for study in this scoping decision.
- B. Any system alternative (an alternative to the proposed transmission line project) not specifically identified for study in this scoping decision.
- C. Policy issues concerning whether utilities or local governments should be liable for the cost to relocate utility poles when roadways are widened.
- D. The manner in which land owners are paid for transmission line right-of-way easements.
- E. Of the alternatives proposed during the scoping process to mitigate potential impacts of the project, the following will not be included for further study in the EIS:

System Alternative – Closing of Existing Coal-Fired Power Plants

The closing of existing coal-fired power plants in neighboring states was proposed as an alternative to the project. This alternative is beyond the authority of the State of Minnesota. Further, implementation of the proposed project will, over time, accomplish the result sought by the proposer – i.e., greater access to relatively low-cost wind energy

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will curtail the use of relatively higher cost coal generation in the Upper Midwest generally. This alternative would not aid in the Commission's decision on the CN application.

Brown Route

The brown route was proposed to follow U.S. Highway 169 and existing 69 and 115 kV transmission lines that parallel the highway.³⁵ This route has relatively more impacts to residences and communities than other routes proposed for the project.³⁶ Accordingly, the brown route would not aid in the Commission's decision on the route permit application.

Route Segment S

Route segment S was proposed to minimize impacts to the city of North Mankato.³⁷ This segment crosses Minneopa State Park and is not permittable.³⁸ Accordingly, route segment S would not aid in the Commission's decision on the route permit application.

Route Segments T through X

Route segments T through X were proposed by citizens along the purple route near the Watonwan River.³⁹ These segments have relatively greater impacts than other routing alternatives that mitigate impacts at the Watonwan River (segments H through M, discussed above).⁴⁰ Accordingly, route segments T through X would not aid in the Commission's decision on the route permit application.

SCHEDULE

The draft EIS is anticipated to be completed and available in December 2018. Public meetings and a comment period on the draft EIS will follow. Timely and substantive comments on the draft EIS will be responded to in a final EIS. Public hearings will be held in the project area after issuance of the draft EIS and are anticipated to occur in early 2019.

Signed this 17th day of July, 2018

STATE OF MINNESOTA
DEPARTMENT OF COMMERCE



William Grant, Deputy Commissioner

³⁵ Department Comments and Recommendations.

³⁶ Id.

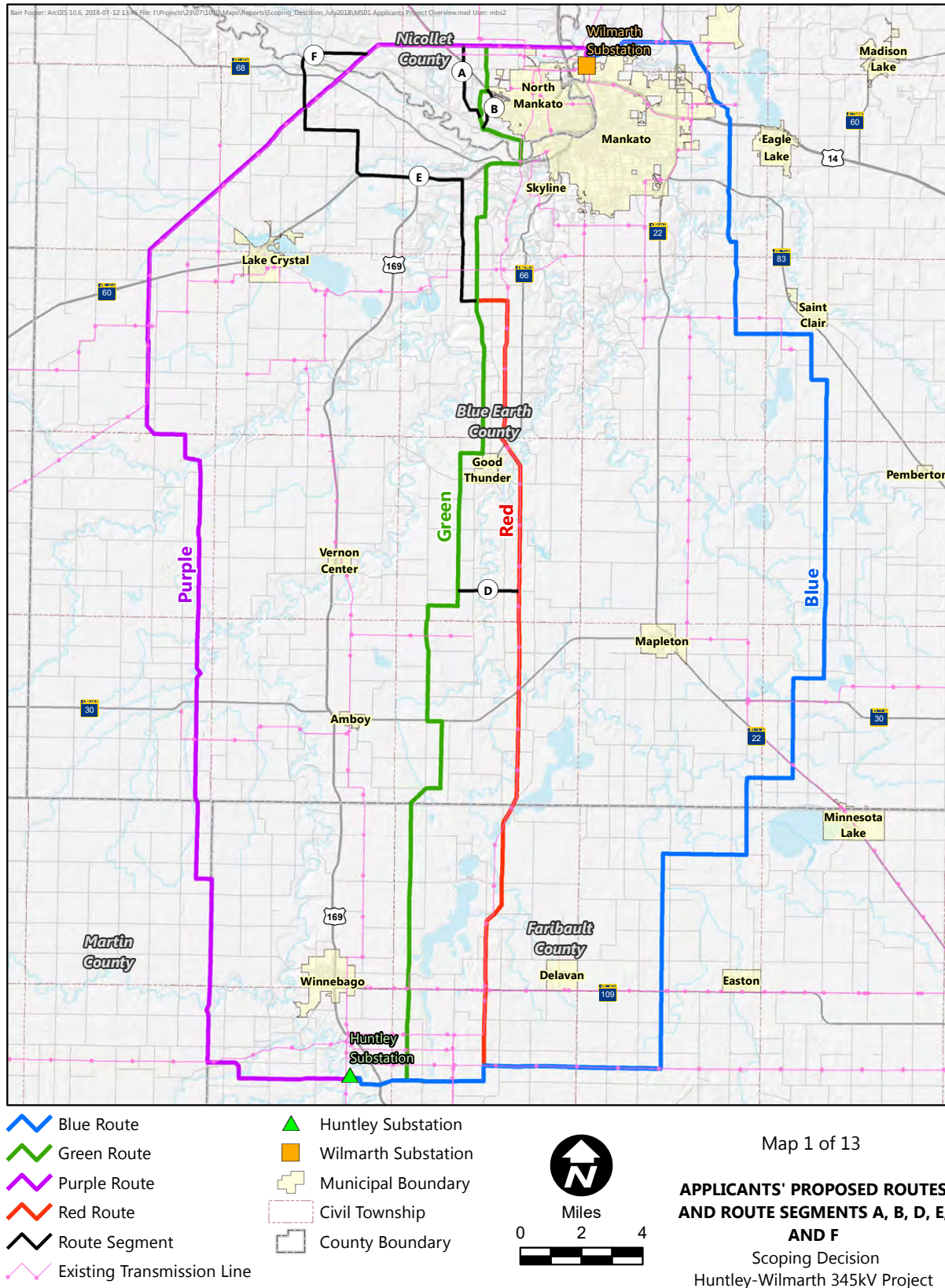
³⁷ Id.

³⁸ Id.

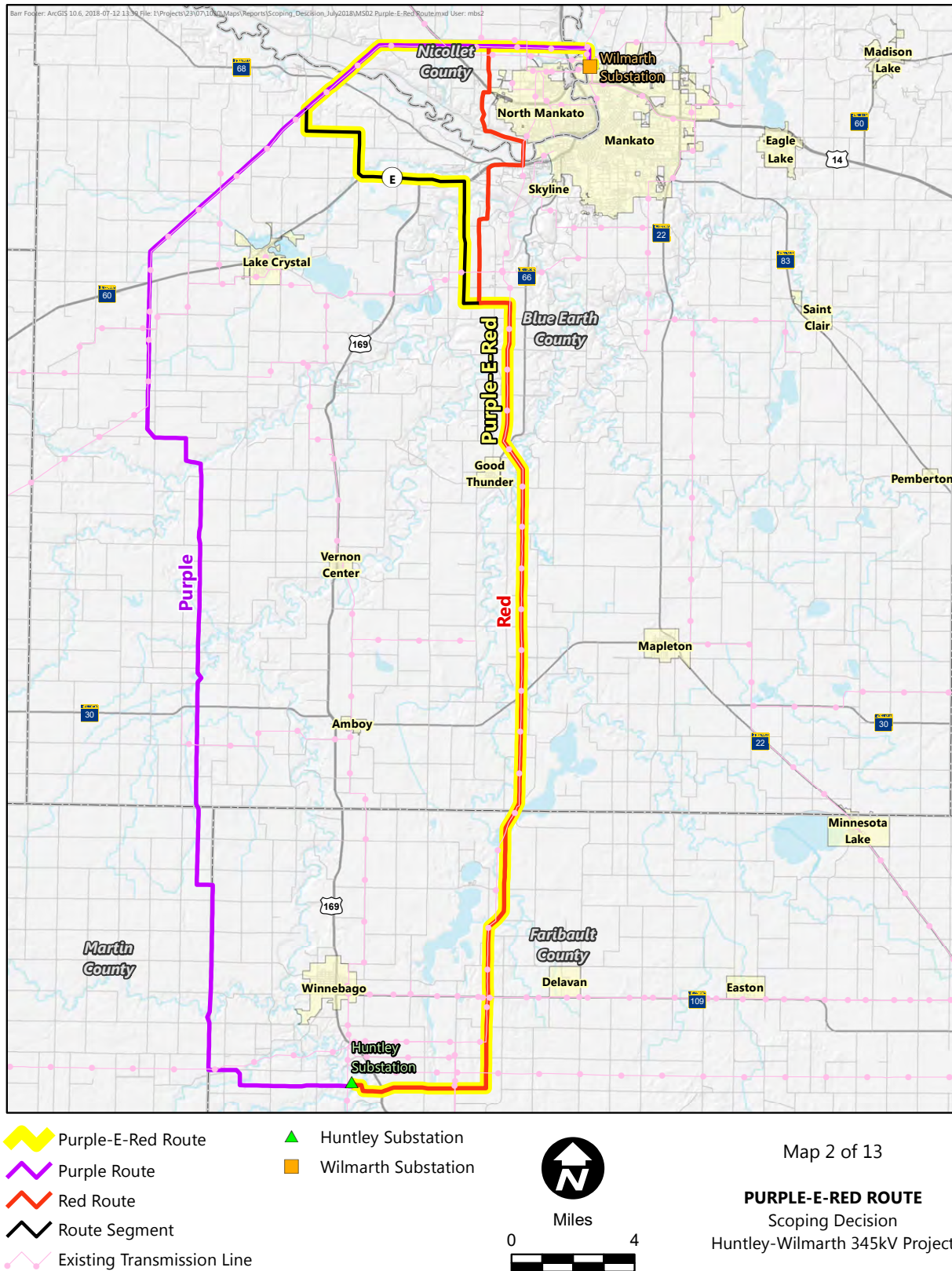
³⁹ Id.

⁴⁰ Id.

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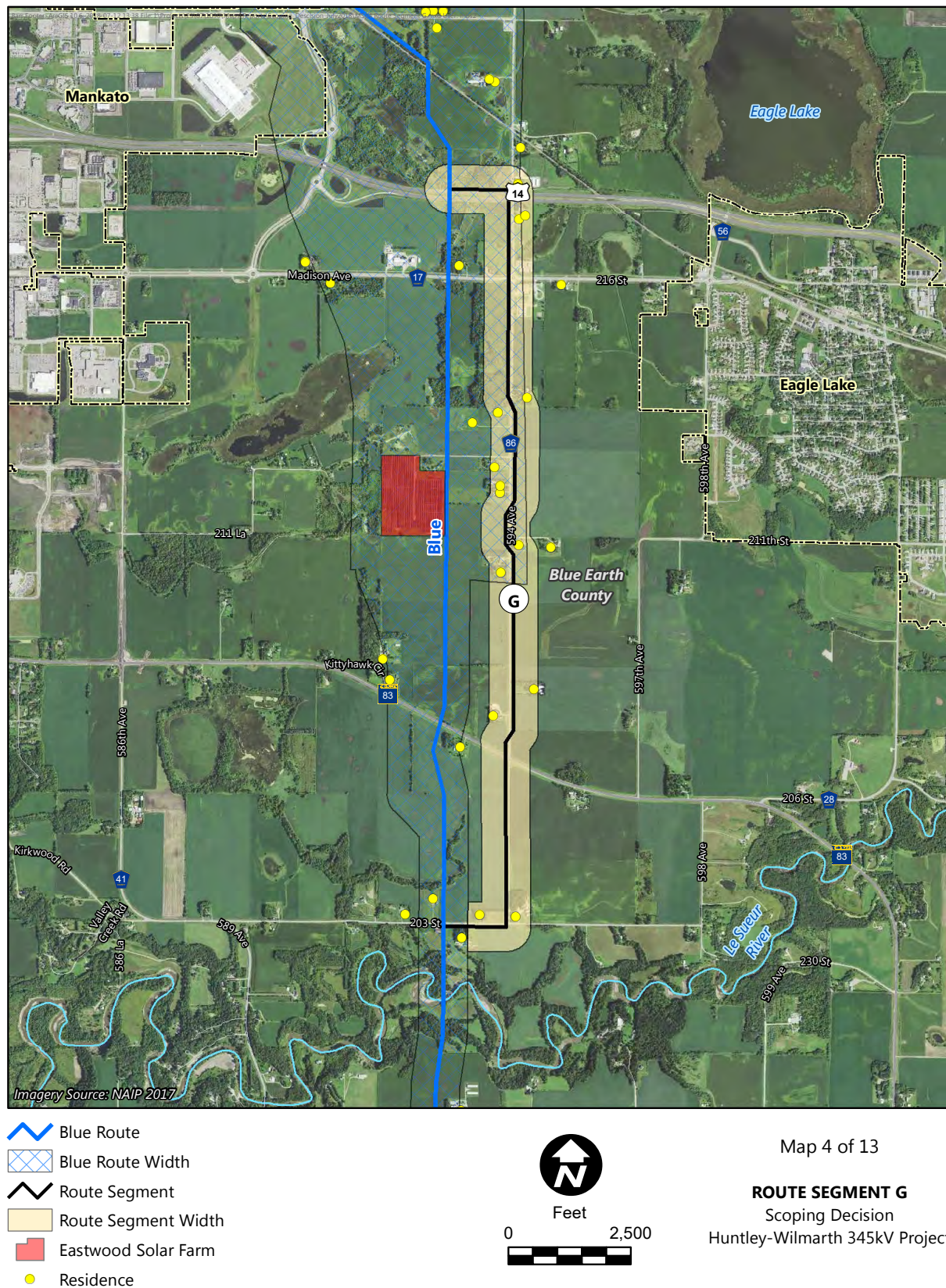
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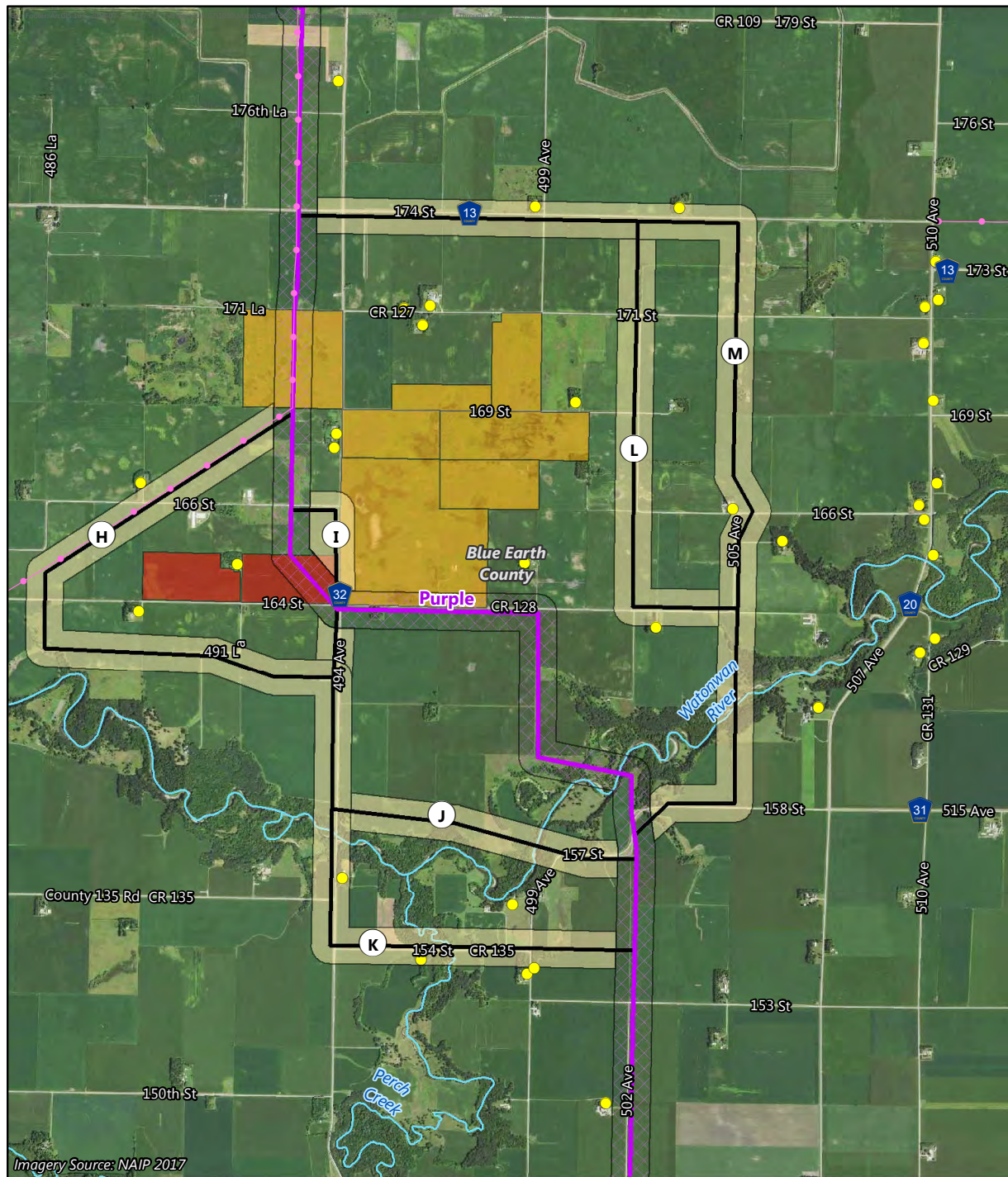
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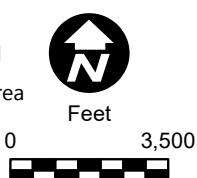


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- Purple Route
- Purple Route Width
- Route Segment
- Route Segment Width
- Existing Transmission Line

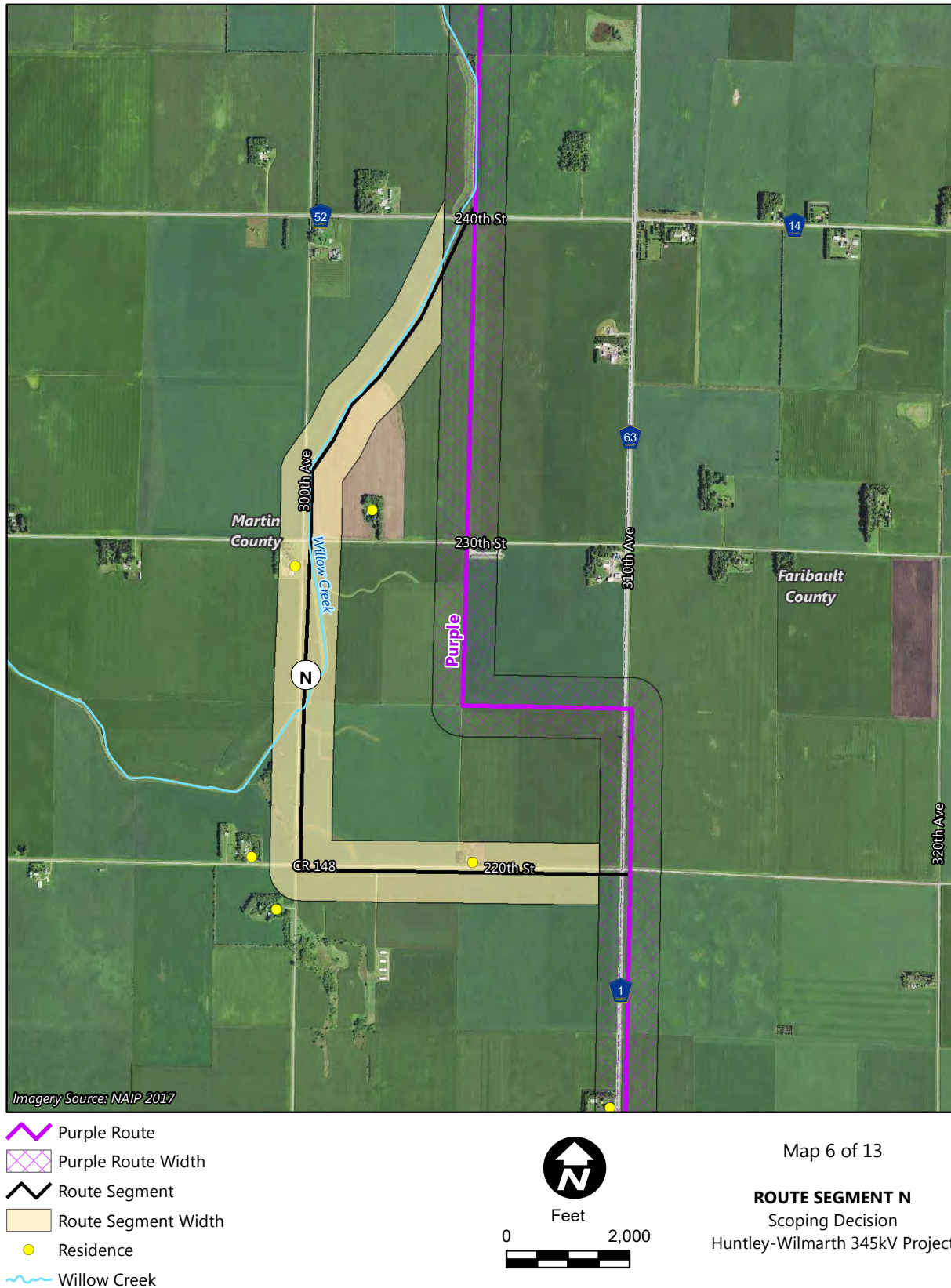
- Residence
- Pheasants Forever Parcel
- Waterfowl Production Area



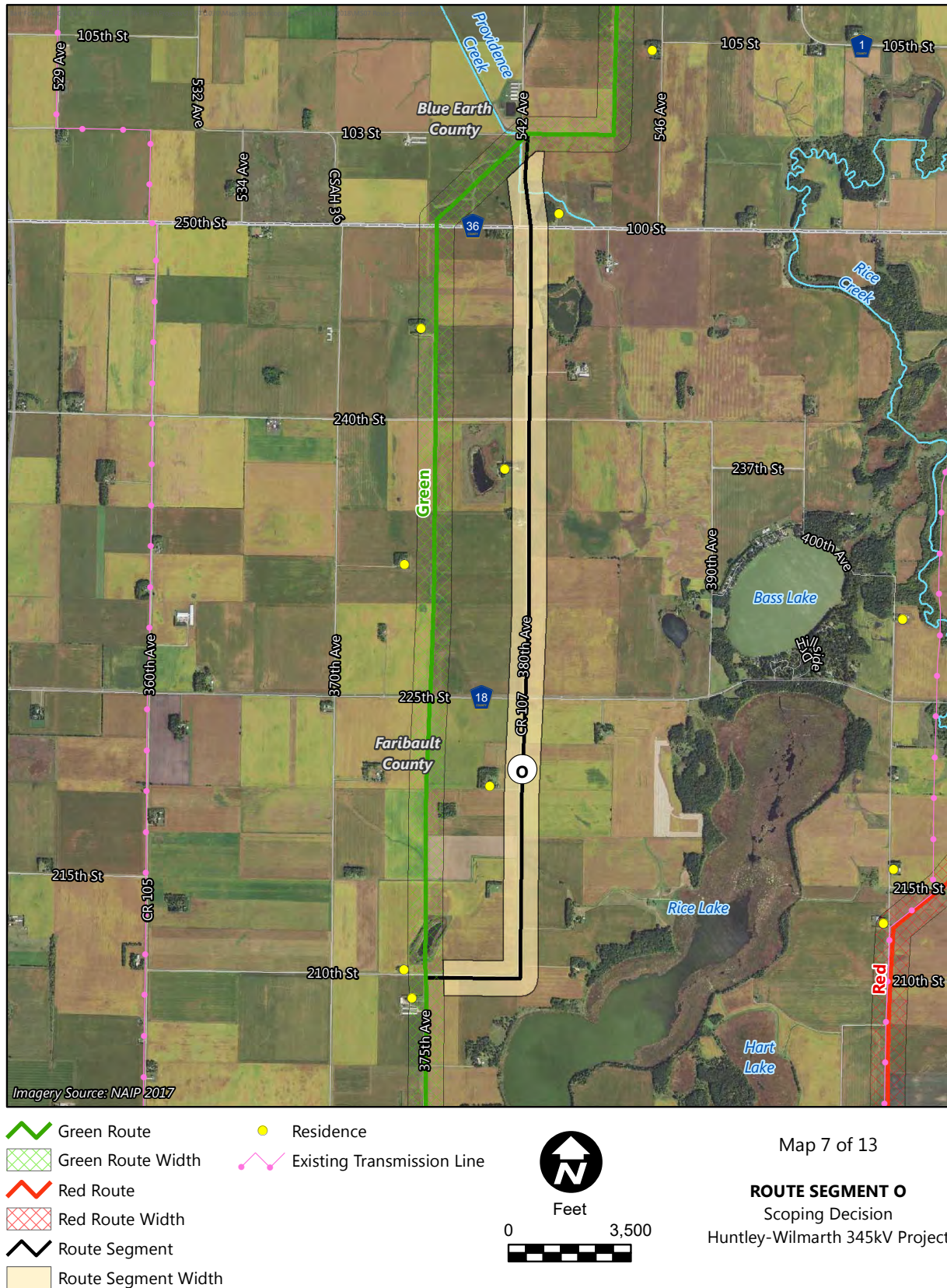
Map 5 of 13

ROUTE SEGMENTS H THROUGH M
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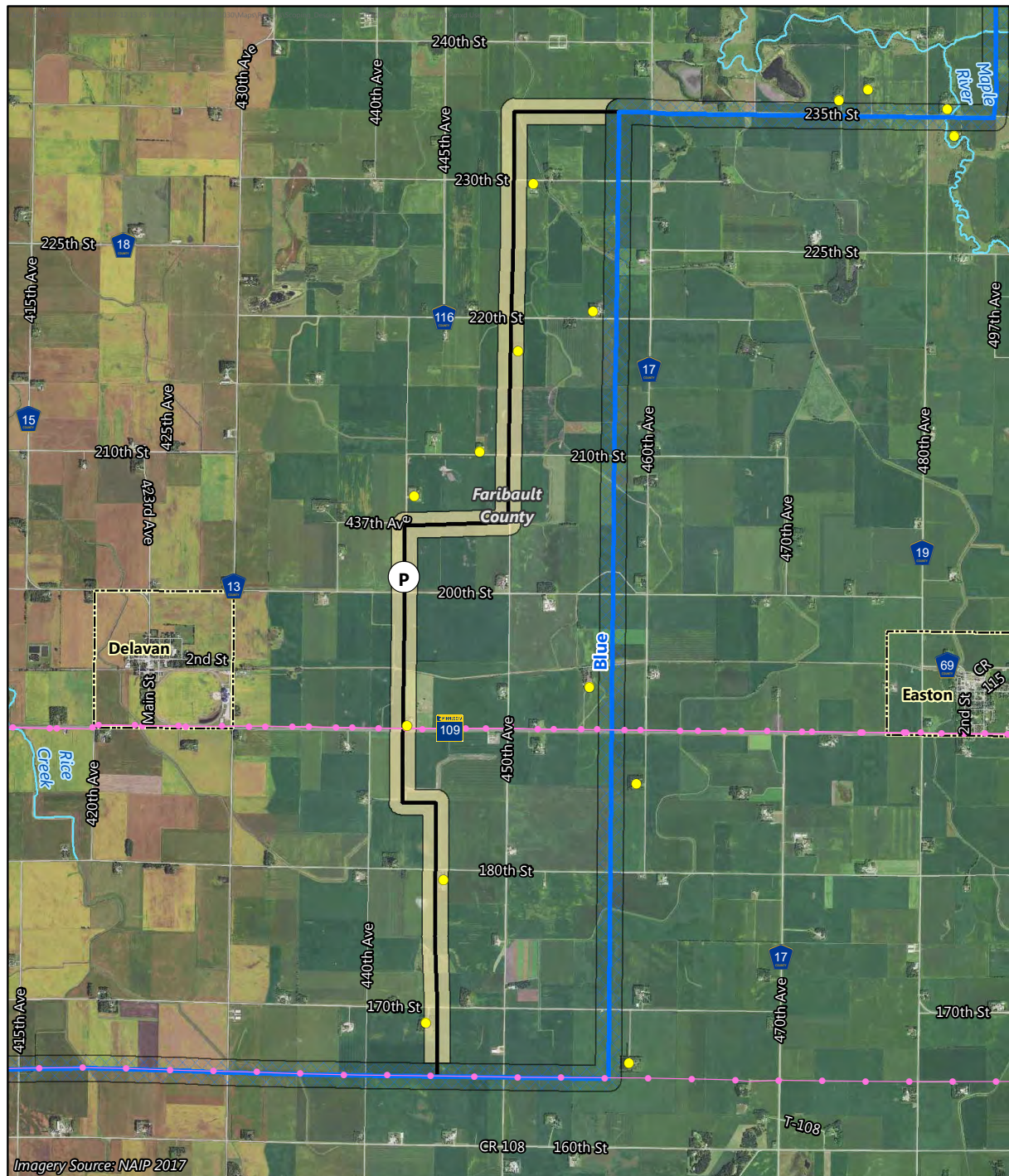
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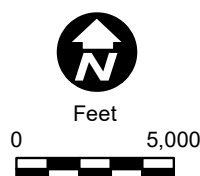
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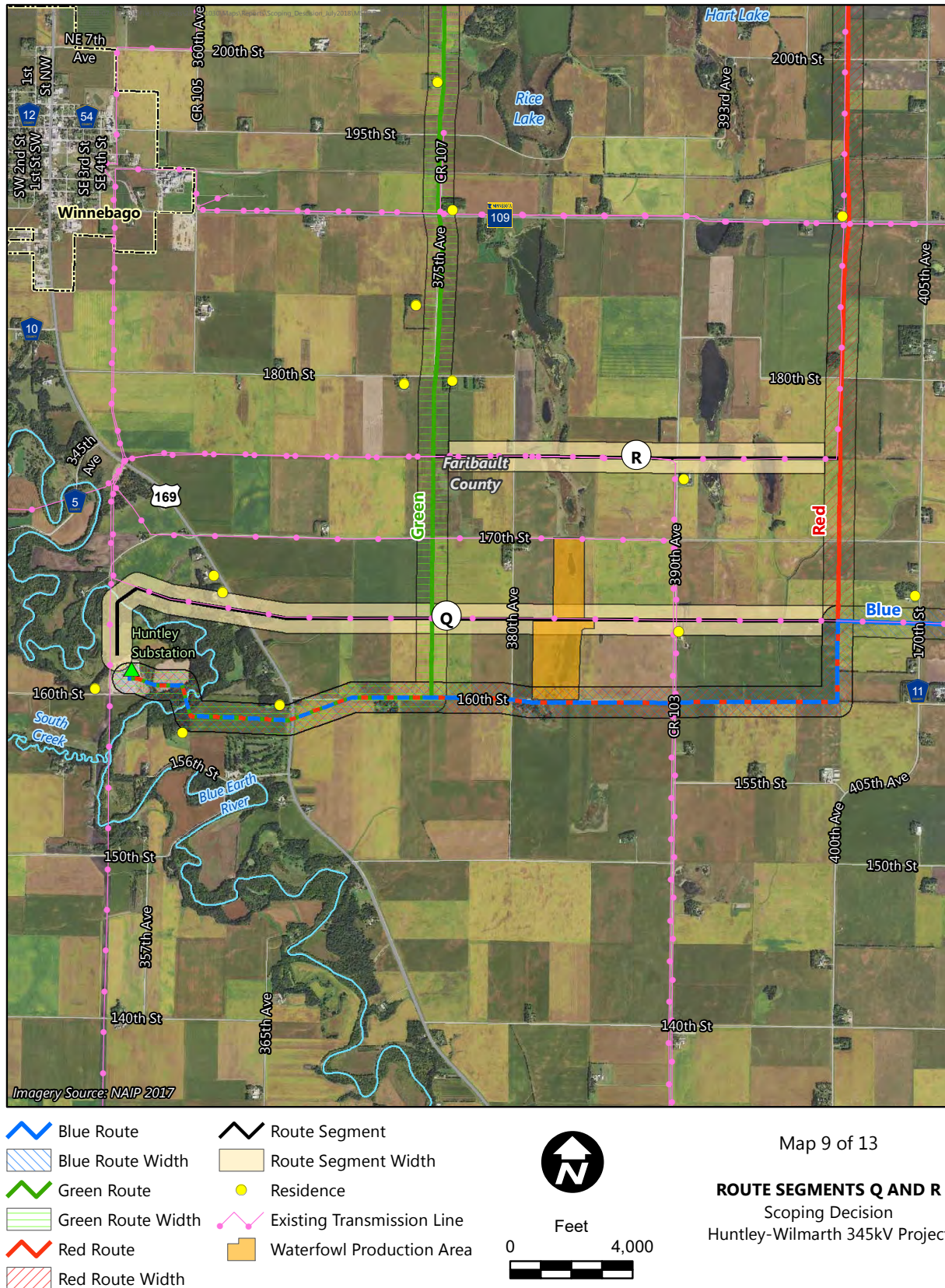
- Blue Route
- Blue Route Width
- Residence
- Existing Transmission Line
- Route Segment
- Route Segment Width



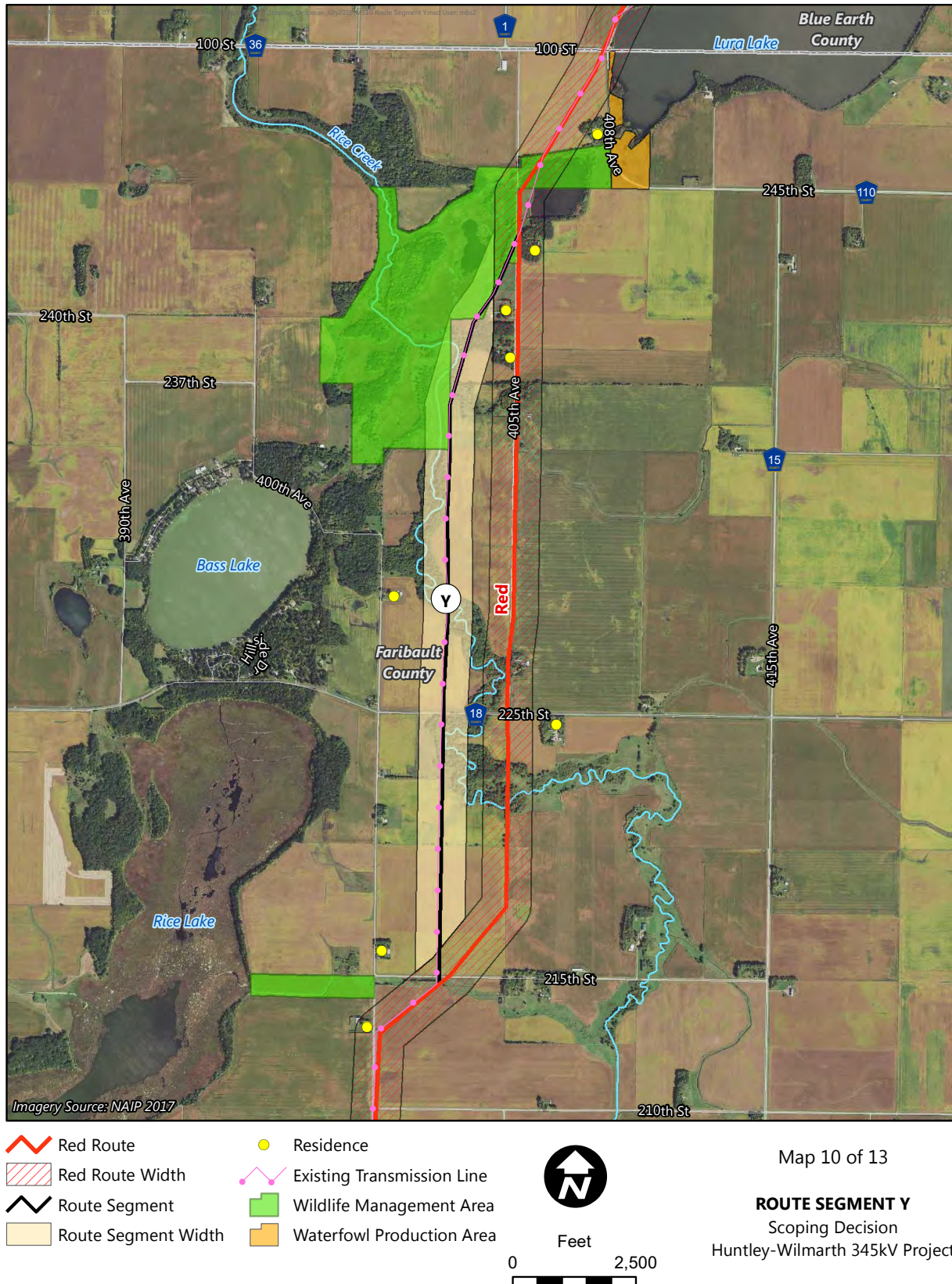
Map 8 of 13

ROUTE SEGMENT P
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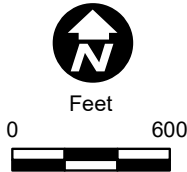
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- Route Segment
- Route Segment Width
- Alignment Alternative
- Residence







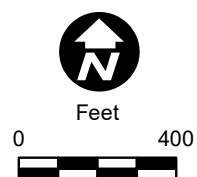
Map 11 of 13

ALIGNMENT ALTERNATIVE 1
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-  Blue Route
-  Blue Route Width
-  Alignment Alternative
-  Residence



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ALIGNMENT ALTERNATIVE 2
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Appendix B

Spatial Data Sources

City of North Mankato. Existing Land Use. Received on May 8, 2018

City of North Mankato. Future Land Use. Received on May 8, 2018

Faribault County. Planned Road Construction. http://www.faribaultcountypublicworks.com/files/_2017-2021%205yr%20plan%20Map%20Revised%202-20-18.pdf. Accessed on May 10, 2018

Faribault County. Comp Land Use Plan. http://www.faribaultcountyswcd.com/index.php?option=com_content&view=article&id=152%3Aland-use-plan&catid=10%3Ahome-news&Itemid=43. Accessed on May 10, 2018

City of North Mankato. Zoning Map. Received on May 10, 2018

City of North Mankato. Future Development Areas. Received on May 10, 2018

Faribault County. Airport Flight Lines. Received on May 10, 2018

Faribault County. Zoning Data. Received on May 10, 2018

Faribault County. Landfill Boundary. Received on May 10, 2018

Faribault County. Muni Boundaries. Received on May 10, 2018

Faribault County. Ditch alignments. Received on May 10, 2018

Faribault County. Forcemain Alignments. Received on May 10, 2018

City of North Mankato. City future utility expansions. Received on May 16, 2018

Nicollet County. Airport Flight Lines. Received on May 17, 2018

Nicollet County. Land Zoning. Received on May 17, 2018

Nicollet County. Land Use Data. Received on May 17, 2018

Nicollet County. Municipal Boundaries. Received on May 17, 2018

Nicollet County. Pipeline Alignments. Received on May 17, 2018

Blue Earth County. Zoning Data. Received on May 22, 2018

Blue Earth County. Legal and Parcel Boundaries. Received on May 23, 2018

City of Mankato. Future Development Areas (PDFs). Received on May 23, 2018

City of Mankato. Airport Flight Lines. Received on May 23, 2018

City of Mankato. City Limits. Received on May 23, 2018

City of Mankato. Closed Landfill. Received on May 23, 2018

City of Mankato. Land Use Data. Received on May 23, 2018

City of Mankato. Zoning Data. Received on May 23, 2018

City of Mankato. Pipeline Alignments. Received on May 23, 2018

City of Mankato. Planned Annexation Areas. Received on May 23, 2018

City of Mankato. Planned Streets. Received on May 23, 2018

City of Mankato. Utility Service Area Plans. Received on May 23, 2018

Blue Earth County. Landfill boundaries. Received on May 29, 2018

cel Energy and Barr Engineering (Digitized). Residence Locations. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Non-Residential Buildings. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Churches. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Schools. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Daycares and Child-care centers. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Hospitals. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Nursing Homes. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Cemeteries. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Airport/Heliport Locations. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Undocumented or Private Airstrips. Received on June 5, 2018

cel Energy and Barr Engineering (Digitized). Communication Towers. Received on June 5, 2018

cel Energy. Parcel Data. Received on June 5, 2018

cel Energy. Existing Transmission Line Alignments. Received on June 5, 2018

Minnesota Department of Transportation. Scenic Byways. <http://mndot.maps.arcgis.com/home/item.html?id=dd9db92a9999453dbf372b899b6b2b24>. Accessed on May 30, 2018

- University of Minnesota. 2013 Landcover. <https://conservancy.umn.edu/handle/11299/181555>. Accessed on August 1, 2018
- Federal Emergency Management Agency. Floodplain / Flood Hazard Areas. https://files.dnr.state.mn.us/waters/watermgmt_section/floodplain/flood-map-updates-timeline.pdf. Accessed on July 5, 2018
- Minnesota Board of Soil and Water Resources. Conservation Easements. <https://gisdata.mn.gov/dataset/bdry-bwsr-rim-cons-easements>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. State Parks. <https://gisdata.mn.gov/dataset/bdry-dnr-lrs-prk>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. State Administered Lands. <https://gisdata.mn.gov/dataset/bdry-dnr-managed-areas>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Walk In Access Points. <https://gisdata.mn.gov/dataset/bdry-dnr-walk-in-access-sites>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Wildlife Management Areas. <https://gisdata.mn.gov/dataset/bdry-dnr-wildlife-mgmt-areas-pub>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Scientific and Natural Areas. <https://gisdata.mn.gov/dataset/bdry-scientific-and-nat-areas>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Wild and Scenic River District. <https://gisdata.mn.gov/dataset/bdry-wild-and-scenic-river-admin>. Accessed on May 31, 2018
- Minnesota Biological Survey. Native Plant Communities by Type. <https://gisdata.mn.gov/dataset/biota-dnr-native-plant-comm>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Native Prairies. <https://gisdata.mn.gov/dataset/biota-dnr-native-prairies>. Accessed on May 31, 2018
- Minnesota Biological Survey. Railroad Right-of-Way Prairies. <https://gisdata.mn.gov/dataset/biota-mcbs-railroad-prairies>. Accessed on May 31, 2018
- Minnesota Biological Survey. Sites of Biodiversity Significance. <https://gisdata.mn.gov/dataset/biota-mcbs-sites-of-biodiversity>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Calcareous Fens. <https://gisdata.mn.gov/dataset/biota-nhis-calcareous-fens>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Wildlife Lakes. <https://gisdata.mn.gov/dataset/env-designated-wildlife-lakes>. Accessed on May 31, 2018
- Minnesota Pollution Control Agency. Impaired Streams (2018 Proposed). <https://gisdata.mn.gov/dataset/env-impaired-proposed-water-2018>. Accessed on May 30, 2018

- Minnesota Pollution Control Agency. Impaired Lakes (2018 Proposed). <https://gisdata.mn.gov/dataset/env-impaired-proposed-water-2018>. Accessed on May 30, 2018
- Minnesota Department of Natural Resources. Lakes of Biological Significance. <https://gisdata.mn.gov/dataset/env-lakes-of-biological-signific>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Migratory Fowl Feeding and Resting Areas. <https://gisdata.mn.gov/dataset/env-migratory-waterfowl-areas>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Trout Lakes. <https://gisdata.mn.gov/dataset/env-trout-lake-designation>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Trout Streams. <https://gisdata.mn.gov/dataset/env-trout-stream-designations>. Accessed on May 31, 2018
- Minnesota Department of Transportation. Aggregate Sources. <https://gisdata.mn.gov/dataset/geos-aggregate-mapping>. Accessed on May 30, 2018
- Minnesota Department of Natural Resources. Water Access Points. <https://gisdata.mn.gov/dataset/loc-water-access-sites>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Aquatic Management Areas. <https://gisdata.mn.gov/dataset/plan-mndnr-fisheries-acquisition>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. State Fee Lands. <https://gisdata.mn.gov/dataset/plan-stateland-dnrcounty>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. County Lands. <https://gisdata.mn.gov/dataset/plan-stateland-dnrcounty>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Mineral Leases. <https://gisdata.mn.gov/dataset/plan-state-minleases>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Campsites. <https://gisdata.mn.gov/dataset/struc-parks-and-trails-campsites>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Hunter Walking Trails. <https://gisdata.mn.gov/dataset/trans-hunter-walking-trails>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Snowmobile Trails. <https://gisdata.mn.gov/dataset/trans-snowmobile-trails-mn>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. State Park Trails. <https://gisdata.mn.gov/dataset/trans-state-park-trails-roads>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. State Trails. <https://gisdata.mn.gov/dataset/trans-state-trails-minnesota>. Accessed on May 31, 2018

- Minnesota Department of Natural Resources. State Water Trails. <https://gisdata.mn.gov/dataset/trans-water-trails-minnesota>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Public Water Inventory Streams. <https://gisdata.mn.gov/dataset/water-mn-public-waters>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Public Water Inventory Basins. <https://gisdata.mn.gov/dataset/water-mn-public-waters>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Public Water Inventory Wetlands. <https://gisdata.mn.gov/dataset/water-mn-public-waters>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. National Wetland Inventory (MN Update). <https://gisdata.mn.gov/dataset/water-nat-wetlands-inv-2009-2014>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Shallow Lakes. <https://gisdata.mn.gov/dataset/water-shallow-lakes-id-by-wldlif>. Accessed on May 31, 2018
- United States Geological Survey. National Hydrography Dataset Flowlines. <https://nhd.usgs.gov/data.html>. Accessed on May 31, 2018
- United States Geological Survey. National Hydrography Dataset Waterbodies. <https://nhd.usgs.gov/data.html>. Accessed on May 31, 2018
- Minnesota Department of Natural Resources. Natural Heritage Information System. <https://www.dnr.state.mn.us/nhnrp/nhis.html>. Accessed on May 31, 2018
- Minnesota State Historic Preservation Office. Historic Sites. Received on June 18, 2018
- Minnesota State Historic Preservation Office. Archaeological Sites. Received on June 18, 2018
- United States Fish and Wildlife Service. Waterfowl Production Area. Received on May 31, 2018
- Minnesota Department of Natural Resources. Game Refuges. Received on May 31, 2018
- Audubon Society. Important Bird Areas. <https://www.audubon.org/important-bird-areas>. Accessed on December 5, 2014
- United States Fish and Wildlife Service. Grassland Bird Conservation Areas. Received on October 14, 2014
- United States Department of Agriculture. Soil Prime Farmland Ratings. <https://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm>. Accessed on July 17, 2018
- Minnesota Department of Commerce. Existing Transmission Line Alignments. Received on August 1, 2016

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Appendix C1

Generic Route Permit Template

GENERIC ROUTE PERMIT TEMPLATE

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

ROUTE PERMIT FOR CONSTRUCTION OF A HIGH-VOLTAGE TRANSMISSION LINE AND ASSOCIATED FACILITIES

IN
[COUNTY]

ISSUED TO
[PERMITTEE]

PUC DOCKET NO. [Docket Number]

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850, this route permit is hereby issued to:

[PERMITTEE]

[Permittee] is authorized by this route permit to construct [Provide a description of the project authorized by the Minnesota Public Utilities Commission].

The transmission line and associated facilities shall be built within the route identified in this permit and as portrayed on the official route maps, and in compliance with the conditions specified in this permit.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

Burl W. Haar,
Executive Secretary

This document can be made available in alternative formats (i.e., large print or audio) by calling 651-296-0406 (voice). Persons with hearing or speech disabilities may call us through their preferred Telecommunications Relay Service.

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FIGURES

ATTACHMENTS

1.0 ROUTE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this route permit to [Permittee Name] (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This permit authorizes the [Permittee Name] to construct [Provide a description of the project as authorized by the Minnesota Public Utilities Commission], and as identified in the attached route permit maps, hereby incorporated into this document.

2.0 PROJECT DESCRIPTION

[Provide a description of the project as authorized by the Minnesota Public Utilities Commission]

2.1 Project Location

[Describe the location of the project including details such as the county, state, city, and townships, as appropriate]

County	Township Name	Township	Range	Section

2.2 Associated Facilities and Substations

[Provide a detailed description of the associated facilities and substations as authorized by the Commission]

2.3 Structures and Conductors

[Provide a detailed description of the structures and conductors authorized by the Commission]

The table below details specifics on the various structure types as presented in the route permit application.

Line Type	Conductor	Structure		Foundation	Height	Span
		Type	Material			

The transmission line and associated facilities shall be designed to meet or exceed all relevant local and state codes, the National Electric Safety Code (NESC), and North American Electric Reliability Corporation (NERC) requirements. This includes standards relating to clearances to

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ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements.

3.0 DESIGNATED ROUTE

The route designated by the Commission in this permit is the route described below and shown on the route maps attached to this permit. The route is generally described as follows:

[Provide detailed description of the authorized route including the route widths and any other specifics relevant to each segment. Also include a reference to the relevant route map to be attached to the permit.]

The identified route widths will provide the Permittee with flexibility for minor adjustments of the specific alignment or right-of-way to accommodate landowner requests and unforeseen conditions. The final alignment (i.e., permanent and maintained rights-of-way) will be located within this designated route unless otherwise authorized below.

3.1 Right-of-Way

The approved right-of-way width for the project is up to *[number]* feet. This permit anticipates that the right-of-way will generally conform to the anticipated alignment as noted on the attached route permit maps unless changes are requested by individual landowners or unforeseen conditions are encountered or are otherwise provided for by this permit. Any alignment modifications within the designated route shall be located so as to have comparable overall impacts relative to the factors in Minn. Rules, part 7850.4100, as does the alignment identified in this permit, and shall be specifically identified and documented in and approved as part of the plan and profile submitted pursuant to section 4.1 of this permit.

Where the transmission line route parallels existing highway and other road rights-of-way, the transmission line right-of-way shall occupy and utilize the existing right-of-way to the maximum extent possible, consistent with the criteria in Minn. Rules, part 7850.4100, the other requirements of this permit, and for highways under the jurisdiction of the Minnesota Department of Transportation (Mn/DOT) rules, policies, and procedures for accommodating utilities in trunk highway rights-of-way.

4.0 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction of the transmission line and associated facilities over the life of this permit.

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4.1 Plan and Profile

At least 30 calendar days before right-of-way preparation for construction begins on any segment or portion of the project, the Permittee shall provide the Commission with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, structure specifications and locations, cleanup, and restoration for the transmission line. The documentation shall include maps depicting the plan and profile including the right-of-way, alignment, and structures in relation to the route and alignment approved per this permit.

The Permittee may not commence construction until the 30 days has expired or until the Commission has advised the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this permit. If the Permittee intends to make any significant changes in its plan and profile or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this permit.

4.2 Construction Practices

The Permittee shall follow those specific construction practices and material specifications described in [Permittee Name] Application to the Commission for a route permit for the [Project Name], dated [Date], unless this permit establishes a different requirement in which case this permit shall prevail.

4.2.1 Field Representative

At least 14 days prior to commencing construction, the Permittee shall advise the Commission in writing of the person or persons designated to be the field representative for the Permittee with the responsibility to oversee compliance with the conditions of this permit during construction.

The field representative's address, phone number, emergency phone number, and email shall be provided to the Commission and shall be made available to affected landowners, residents, public officials and other interested persons. The Permittee may change the field representative at any time upon written notice to the Commission.

4.2.2 Local Governments

During construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these

would be temporary and the Permittee will restore service promptly. Where any impacts to utilities have the potential to occur the Permittee will work with both landowners and local agencies to determine the most appropriate transmission structure placement.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction.

4.2.3 Cleanup

All waste and scrap that is the product of construction shall be removed from the area and properly disposed of upon completion of each task. Personal litter, including bottles, cans, and paper from construction activities shall be removed on a daily basis.

4.2.4 Noise

Construction and routine maintenance activities shall be limited to daytime working hours, as defined in Minn. Rules, part 7030.0200, to ensure nighttime noise level standards will not be exceeded.

4.2.5 Vegetation Removal

The Permittee shall minimize the number of trees to be removed in selecting the right-of-way specifically preserving to the maximum extent practicable windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

Tall tree species located within the transmission line right-of-way that endanger the safe and reliable operation of the transmission facility will be removed. Certain low growing species can be planted in the right-of-way to blend the difference between the right-of-way and adjacent wooded areas, to the extent that the low growing vegetation that will not pose a threat to the transmission facility or impede construction.

The Permittee shall avoid construction and maintenance practices, particularly the use of fertilizer, herbicides or other pesticides, that are inconsistent with the landowner's or tenant's use of the land.

4.2.6 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners or land management agencies prior to final location of structures, rights-of-way, and other areas with the potential for visual disturbance. Care shall be used to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the project during construction and maintenance. Structures shall be placed at a distance, consistent with sound engineering principles and system reliability criteria, from intersecting roads, highway, or trail crossings and could cross roads to minimize or avoid impacts.

4.2.7 Erosion Control

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the facilities shall be returned to pre-construction conditions.

When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select specific site characteristic seed certified to be free of noxious weeds.

Where larger areas of one acre or more are disturbed or other areas designated by the Minnesota Pollution Control Agency (MPCA), the Permittee shall obtain a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater permit from the MPCA.

4.2.8 Wetlands and Water Resources

Wetland impact avoidance measures that shall be implemented during design and construction of the transmission line will include spacing and placing the power poles at variable distances to span and avoid wetlands, watercourses, and floodplains.

Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, construction in wetland areas shall occur during frozen ground conditions. When construction during winter is not possible, wooden or composite mats shall be used to protect wetland vegetation. Soil excavated from the wetlands and riparian areas shall be contained and not placed back into the wetland or riparian area.

Wetlands and riparian areas shall be accessed using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts. No staging or stringing set up areas shall be placed within or adjacent to wetlands or water resources, as practicable. Power pole structures shall be assembled on upland areas before they are brought to the site for installation. Areas disturbed by construction activities shall be restored to pre-construction conditions.

All requirements of the U.S. Army Corps of Engineers (wetlands under federal jurisdiction), Minnesota Department of Natural Resources (Public Waters Wetlands), and County (wetlands under the jurisdiction of the Minnesota Wetland Conservation Act) shall be met.

4.2.9 Temporary Work Space

The Permittee shall limit temporary easements to special construction access needs and additional staging or lay-down areas required outside of the authorized right-of-way. Temporary space shall be selected to limit the removal and impacts to vegetation. Temporary easements outside of the authorized transmission line right-of-way will be obtained from affected landowners through rental agreements and are not provided for in this permit.

Temporary driveways may be constructed between the roadway and the structures to minimize impact using the shortest route possible. Construction mats should also be used to minimize impacts on access paths and construction areas.

4.2.10 Restoration

The Permittee shall restore the right-of-way, temporary work spaces, access roads, abandoned right-of-way, and other public or private lands affected by construction of the transmission line. Restoration within the right-of-way must be compatible with the safe operation, maintenance, and inspection of the transmission line. Within 60 days after completion of all restoration activities, the Permittee shall advise the Commission in writing of the completion of such activities.

The Permittee shall fairly compensate landowners for damage to crops, fences, landscaping, drain tile, or other damages sustained during construction.

4.2.11 Notice of Permit

The Permittee shall inform all employees, contractors, and other persons involved in the transmission line construction of the terms and conditions of this permit.

4.3 Periodic Status Reports

The Permittee shall report to the Commission on progress regarding finalization of the route, design of structures, and construction of the transmission line. The Permittee need not report more frequently than monthly.

4.4 Complaint Procedures

Prior to the start of construction, the Permittee shall submit to the Commission the procedures that will be used to receive and respond to complaints. The procedures shall be in accordance with the requirements set forth in the complaint procedures attached to this permit [Attachment].

4.5 Notification to Landowners

The Permittee shall provide all affected landowners with a copy of this permit and, as a separate information piece, the complaint procedures at the time of the first contact with the landowners after issuance of this permit. The Permittee shall contact landowners prior to entering the property or conducting maintenance along the route.

The Permittee shall work with landowners to locate the high-voltage transmission line to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads.

4.6 Completion of Construction

4.6.1 Notification to Commission

At least three days before the line is to be placed into service, the Permittee shall notify the Commission of the date on which the line will be placed into service and the date on which construction was complete.

4.6.2 As-Built

Within 60 days after completion of construction, the Permittee shall submit copies of all final as-built plans and specifications developed during the project.

4.6.3 GPS Data

Within 60 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (e.g., ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the transmission line and each substation connected.

4.7 Electrical Performance Standards

4.7.1 Grounding

The Permittee shall design, construct, and operate the transmission line in a manner so that the maximum induced steady-state short-circuit current shall be limited to five milliamperes root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the right-of-way, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short-circuit current between ground and the object so as not to exceed one milliamperes rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the NESC. The Permittee shall address and rectify any induced current problems that arise during transmission line operation.

4.7.2 Electric Field

The transmission line shall be designed, constructed, and operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

4.7.3 Interference with Communication Devices

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the transmission line, the Permittee shall take whatever action is feasible to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the line.

4.8 Other Requirements

4.8.1 Applicable Codes

The Permittee shall comply with applicable NERC planning standards and requirements of the NESC including clearances to ground, clearance to crossing utilities, clearance to buildings, right-of way widths, erecting power poles, and stringing of transmission line conductors.

4.8.2 Other Permits

The Permittee shall comply with all applicable state rules and statutes. The Permittee shall obtain all required permits for the project and comply with the conditions of these permits. A list of the required permits is included in the permit application. The Permittee shall submit a copy of such permits to the Commission upon request.

4.8.3 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this route permit shall be the sole approval required to be obtained by the Permittee for construction of the transmission facilities and this permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

4.8.4 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to identified archaeological and historic resources when installing the high-voltage transmission line on the approved route. In the event that a resource is encountered, the State Historic Preservation Office should be contacted and consulted; the nature of the resource should be identified; and a determination should be made on the eligibility for listing in the National Register of Historic Places. Where feasible, avoidance of the resource is required.

4.8.5 Avian Mitigation

The Permittee's standard transmission design shall incorporate adequate spacing of conductors and grounding devices in accordance with Avian Power Line Interaction Committee standards to eliminate the risk of electrocution to raptors with larger wingspans that may simultaneously come in contact with a conductor and grounding devices.

4.9 Delay in Construction

If the Permittee has not commenced construction or improvement of the route within four years after the date of issuance of this permit the Permittee shall file a report on the failure to construct

and the Commission shall consider suspension of the permit in accordance with Minn. Rules, part 7850.4700.

4.10 Special Conditions

The Permittee shall provide a report to the Commission as part of the plan and profile submission that describes the actions taken and mitigative measures developed regarding the project and the following special conditions.

[Describe any special conditions]

Examples of special conditions included in permits:

- *Avian Mitigation Plan*
- *Environmental Control Plan*
- *Agriculture Mitigation Plan*
- *Vegetation Management Plan*
- *Property Restrictions*
- *Minnesota Department of Natural Resources Requirements*
- *Minnesota Pollution Control Requirements*
- *Minnesota State Historical Preservation Office Requirements*
- *Minnesota Department of Transportation Requirements*

5.0 PERMIT AMENDMENT

This permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required.

6.0 TRANSFER OF PERMIT

The Permittee may request at any time that the Commission transfer this permit to another person or entity. The Permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer.

The person to whom the permit is to be transferred shall provide the Commission with such information as the Commission shall require to determine whether the new Permittee can comply

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with the conditions of the permit. The Commission may authorize transfer of the permit after affording the Permittee, the new Permittee, and interested persons such process as is required.

7.0 REVOCATION OR SUSPENSION OF THE PERMIT

The Commission may initiate action to revoke or suspend this permit at any time. The Commission shall act in accordance with the requirements of Minn. Rules, part 7850.5100, to revoke or suspend the permit.

GENERIC TEMPLATE

ATTACHMENT []

**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLAINT HANDLING PROCEDURES FOR
HIGH-VOLTAGE TRANSMISSION LINES**

A. Purpose

To establish a uniform and timely method of reporting complaints received by the permittee concerning permit conditions for site preparation, construction, cleanup and restoration, operation, and resolution of such complaints.

B. Scope

This document describes complaint reporting procedures and frequency.

C. Applicability

The procedures shall be used for all complaints received by the permittee and all complaints received by the Minnesota Public Utilities Commission (Commission) under Minn. Rules, parts 7829.1500 or 7829.1700 relevant to this permit.

D. Definitions

Complaint: A verbal or written statement presented to the permittees by a person expressing dissatisfaction or concern regarding site preparation, cleanup or restoration or other route and associated facilities permit conditions. Complaints do not include requests, inquiries, questions or general comments.

Substantial Complaint: A written complaint alleging a violation of a specific permit condition that, if substantiated, could result in permit modification or suspension pursuant to the applicable regulations.

Unresolved Complaint: A complaint which, despite the good faith efforts of the permittee and a person, remains to both or one of the parties unresolved or unsatisfactorily resolved.

Person: An individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

E. Complaint Documentation and Processing

1. The permittee shall designate an individual to summarize complaints for the Commission. This person's name, phone number and email address shall accompany all complaint submittals.

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2. A person presenting the complaint should to the extent possible, include the following information in their communications:
 - a. name, address, phone number, and email address;
 - b. date of complaint;
 - c. tract or parcel number; and
 - d. whether the complaint relates to a permit matter or a compliance issue.
3. The permittee shall document all complaints by maintaining a record of all applicable information concerning the complaint, including the following:
 - a. docket number and project name;
 - b. name of complainant, address, phone number and email address;
 - c. precise description of property or parcel number;
 - d. name of permittee representative receiving complaint and date of receipt;
 - e. nature of complaint and the applicable permit condition(s);
 - f. activities undertaken to resolve the complaint; and
 - g. final disposition of the complaint.

F. Reporting Requirements

The permittee shall commence complaint reporting at the beginning of project construction and continue through the term of the permit. The permittee shall report all complaints to the Commission according to the following schedule:

Immediate Reports: All substantial complaints shall be reported to the Commission the same day received, or on the following working day for complaints received after working hours. Such reports are to be directed to the Commission's Consumer Affairs Office at 1-800-657-3782 (voice messages are acceptable) or consumer.puc@state.mn.us. For e-mail reporting, the email subject line should read "EFP Complaint" and include the appropriate project docket number.

Monthly Reports: By the 15th of each month, a summary of all complaints, including substantial complaints received or resolved during the preceding month, shall be filed to Dr. Burl W. Haar, Executive Secretary, Public Utilities Commission, using the eDockets system. The eDockets system is located at:
<https://www.edockets.state.mn.us/EFiling/home.jsp>

If no complaints were received during the preceding month, the permittee shall submit (eFile) a summary indicating that no complaints were received.

G. Complaints Received by the Commission

Complaints received directly by the Commission from aggrieved persons regarding site preparation, construction, cleanup, restoration, operation and maintenance shall be promptly sent to the permittee.

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H. Commission Process for Unresolved Complaints

Commission staff shall perform an initial evaluation of unresolved complaints submitted to the Commission. Complaints raising substantial permit issues shall be processed and resolved by the Commission. Staff shall notify the permittee and appropriate persons if it determines that the complaint is a substantial complaint. With respect to such complaints, each party shall submit a written summary of its position to the Commission no later than ten (10) days after receipt of the staff notification. The complaint will be presented to the Commission for a decision as soon as practicable.

I. Permittee Contacts for Complaints and Complaint Reporting

Complaints may be filed by mail or email to:

[Permittee Name]
[Permittee Complaint Contact]
[Permittee Address]
[Permittee Telephone Number]
[Permittee Email]

This information shall be maintained current by informing the Commission of any changes by eFiling, as they become effective.

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**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLIANCE FILING PROCEDURE FOR
PERMITTED ENERGY FACILITIES**

A. Purpose

To establish a uniform and timely method of submitting information required by the Commission energy facility permits.

B. Scope and Applicability

This procedure encompasses all compliance filings required by permit.

C. Definitions

Compliance Filing: A filing of information to the Commission, where the information is required by a Commission site or route permit.

D. Responsibilities

1. The permittee shall eFile all compliance filings with Dr. Burl W. Haar, Executive Secretary, Public Utilities Commission, through the eDockets system. The eDockets system is located at: <https://www.edockets.state.mn.us/EFiling/home.jsp>

General instructions are provided on the eDockets website. Permittees must register on the website to eFile documents.

2. All filings must have a cover sheet that includes:

- a. Date
- b. Name of submitter/permittee
- c. Type of permit (site or route)
- d. Project location
- e. Project docket number
- f. Permit section under which the filing is made
- g. Short description of the filing

3. Filings that are graphic intensive (e.g., maps, engineered drawings) must, in addition to being eFiled, be submitted as paper copies and on CD. Paper copies and CDs should be sent to: 1) Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN 55101-2147, and 2) Department of Commerce, Energy Facility Permitting, 85 7th Place East, Suite 500, St. Paul, MN 55101-2198.

The Commission may request a paper copy of any eFiled document.

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PERMIT COMPLIANCE FILINGS¹

PERMITTEE:

PERMIT TYPE:

PROJECT LOCATION:

PUC DOCKET NUMBER:

Filing Number	Permit Section	Description of Compliance Filing	Due Date

¹ This compilation of permit compliance filings is provided for the convenience of the permittee and the Commission. It is not a substitute for the permit; the language of the permit controls.

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GENERIC ROUTE PERMIT TEMPLATE

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

ROUTE PERMIT FOR CONSTRUCTION OF A HIGH-VOLTAGE TRANSMISSION LINE AND ASSOCIATED FACILITIES

IN
[COUNTY]

ISSUED TO
[PERMITTEE]

PUC DOCKET NO. [Docket Number]

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850, this route permit is hereby issued to:

[PERMITTEE]

[Permittee] is authorized by this route permit to construct [Provide a description of the project authorized by the Minnesota Public Utilities Commission].

The transmission line and associated facilities shall be built within the route identified in this permit and as portrayed on the official route maps, and in compliance with the conditions specified in this permit.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

Burl W. Haar,
Executive Secretary

This document can be made available in alternative formats (i.e., large print or audio) by calling 651-296-0406 (voice). Persons with hearing or speech disabilities may call us through their preferred Telecommunications Relay Service.

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FIGURES

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1.0 ROUTE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this route permit to [Permittee Name] (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This permit authorizes the [Permittee Name] to construct [Provide a description of the project as authorized by the Minnesota Public Utilities Commission], and as identified in the attached route permit maps, hereby incorporated into this document.

2.0 PROJECT DESCRIPTION

[Provide a description of the project as authorized by the Minnesota Public Utilities Commission]

2.1 Project Location

[Describe the location of the project including details such as the county, state, city, and townships, as appropriate]

County	Township Name	Township	Range	Section

2.2 Associated Facilities and Substations

[Provide a detailed description of the associated facilities and substations as authorized by the Commission]

2.3 Structures and Conductors

[Provide a detailed description of the structures and conductors authorized by the Commission]

The table below details specifics on the various structure types as presented in the route permit application.

Line Type	Conductor	Structure		Foundation	Height	Span
		Type	Material			

The transmission line and associated facilities shall be designed to meet or exceed all relevant local and state codes, the National Electric Safety Code (NESC), and North American Electric Reliability Corporation (NERC) requirements. This includes standards relating to clearances to

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ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements.

3.0 DESIGNATED ROUTE

The route designated by the Commission in this permit is the route described below and shown on the route maps attached to this permit. The route is generally described as follows:

[Provide detailed description of the authorized route including the route widths and any other specifics relevant to each segment. Also include a reference to the relevant route map to be attached to the permit.]

The identified route widths will provide the Permittee with flexibility for minor adjustments of the specific alignment or right-of-way to accommodate landowner requests and unforeseen conditions. The final alignment (i.e., permanent and maintained rights-of-way) will be located within this designated route unless otherwise authorized below.

3.1 Right-of-Way

The approved right-of-way width for the project is up to *[number]* feet. This permit anticipates that the right-of-way will generally conform to the anticipated alignment as noted on the attached route permit maps unless changes are requested by individual landowners or unforeseen conditions are encountered or are otherwise provided for by this permit. Any alignment modifications within the designated route shall be located so as to have comparable overall impacts relative to the factors in Minn. Rules, part 7850.4100, as does the alignment identified in this permit, and shall be specifically identified and documented in and approved as part of the plan and profile submitted pursuant to section 4.1 of this permit.

Where the transmission line route parallels existing highway and other road rights-of-way, the transmission line right-of-way shall occupy and utilize the existing right-of-way to the maximum extent possible, consistent with the criteria in Minn. Rules, part 7850.4100, the other requirements of this permit, and for highways under the jurisdiction of the Minnesota Department of Transportation (Mn/DOT) rules, policies, and procedures for accommodating utilities in trunk highway rights-of-way.

4.0 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction of the transmission line and associated facilities over the life of this permit.

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4.1 Plan and Profile

At least 30 calendar days before right-of-way preparation for construction begins on any segment or portion of the project, the Permittee shall provide the Commission with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, structure specifications and locations, cleanup, and restoration for the transmission line. The documentation shall include maps depicting the plan and profile including the right-of-way, alignment, and structures in relation to the route and alignment approved per this permit.

The Permittee may not commence construction until the 30 days has expired or until the Commission has advised the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this permit. If the Permittee intends to make any significant changes in its plan and profile or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this permit.

4.2 Construction Practices

The Permittee shall follow those specific construction practices and material specifications described in [Permittee Name] Application to the Commission for a route permit for the [Project Name], dated [Date], unless this permit establishes a different requirement in which case this permit shall prevail.

4.2.1 Field Representative

At least 14 days prior to commencing construction, the Permittee shall advise the Commission in writing of the person or persons designated to be the field representative for the Permittee with the responsibility to oversee compliance with the conditions of this permit during construction.

The field representative's address, phone number, emergency phone number, and email shall be provided to the Commission and shall be made available to affected landowners, residents, public officials and other interested persons. The Permittee may change the field representative at any time upon written notice to the Commission.

4.2.2 Local Governments

During construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these

would be temporary and the Permittee will restore service promptly. Where any impacts to utilities have the potential to occur the Permittee will work with both landowners and local agencies to determine the most appropriate transmission structure placement.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction.

4.2.3 Cleanup

All waste and scrap that is the product of construction shall be removed from the area and properly disposed of upon completion of each task. Personal litter, including bottles, cans, and paper from construction activities shall be removed on a daily basis.

4.2.4 Noise

Construction and routine maintenance activities shall be limited to daytime working hours, as defined in Minn. Rules, part 7030.0200, to ensure nighttime noise level standards will not be exceeded.

4.2.5 Vegetation Removal

The Permittee shall minimize the number of trees to be removed in selecting the right-of-way specifically preserving to the maximum extent practicable windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

Tall tree species located within the transmission line right-of-way that endanger the safe and reliable operation of the transmission facility will be removed. Certain low growing species can be planted in the right-of-way to blend the difference between the right-of-way and adjacent wooded areas, to the extent that the low growing vegetation that will not pose a threat to the transmission facility or impede construction.

The Permittee shall avoid construction and maintenance practices, particularly the use of fertilizer, herbicides or other pesticides, that are inconsistent with the landowner's or tenant's use of the land.

4.2.6 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners or land management agencies prior to final location of structures, rights-of-way, and other areas with the potential for visual disturbance. Care shall be used to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the project during construction and maintenance. Structures shall be placed at a distance, consistent with sound engineering principles and system reliability criteria, from intersecting roads, highway, or trail crossings and could cross roads to minimize or avoid impacts.

4.2.7 Erosion Control

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the facilities shall be returned to pre-construction conditions.

When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select specific site characteristic seed certified to be free of noxious weeds.

Where larger areas of one acre or more are disturbed or other areas designated by the Minnesota Pollution Control Agency (MPCA), the Permittee shall obtain a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater permit from the MPCA.

4.2.8 Wetlands and Water Resources

Wetland impact avoidance measures that shall be implemented during design and construction of the transmission line will include spacing and placing the power poles at variable distances to span and avoid wetlands, watercourses, and floodplains.

Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, construction in wetland areas shall occur during frozen ground conditions. When construction during winter is not possible, wooden or composite mats shall be used to protect wetland vegetation. Soil excavated from the wetlands and riparian areas shall be contained and not placed back into the wetland or riparian area.

The Permittee shall inform all employees, contractors, and other persons involved in the transmission line construction of the terms and conditions of this permit.

4.3 Periodic Status Reports

The Permittee shall report to the Commission on progress regarding finalization of the route, design of structures, and construction of the transmission line. The Permittee need not report more frequently than monthly.

4.4 Complaint Procedures

Prior to the start of construction, the Permittee shall submit to the Commission the procedures that will be used to receive and respond to complaints. The procedures shall be in accordance with the requirements set forth in the complaint procedures attached to this permit [Attachment].

4.5 Notification to Landowners

The Permittee shall provide all affected landowners with a copy of this permit and, as a separate information piece, the complaint procedures at the time of the first contact with the landowners after issuance of this permit. The Permittee shall contact landowners prior to entering the property or conducting maintenance along the route.

The Permittee shall work with landowners to locate the high-voltage transmission line to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads.

4.6 Completion of Construction

4.6.1 Notification to Commission

At least three days before the line is to be placed into service, the Permittee shall notify the Commission of the date on which the line will be placed into service and the date on which construction was complete.

4.6.2 As-Builts

Within 60 days after completion of construction, the Permittee shall submit copies of all final as-built plans and specifications developed during the project.

4.6.3 GPS Data

The Permittee shall inform all employees, contractors, and other persons involved in the transmission line construction of the terms and conditions of this permit.

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The Permittee shall report to the Commission on progress regarding finalization of the route, design of structures, and construction of the transmission line. The Permittee need not report more frequently than monthly.

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4.6.2 As-Builts

Within 60 days after completion of construction, the Permittee shall submit copies of all final as-built plans and specifications developed during the project.

4.6.3 GPS Data

Within 60 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (e.g., ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the transmission line and each substation connected.

4.7 Electrical Performance Standards

4.7.1 Grounding

The Permittee shall design, construct, and operate the transmission line in a manner so that the maximum induced steady-state short-circuit current shall be limited to five milliamperes root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the right-of-way, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short-circuit current between ground and the object so as not to exceed one milliamperes rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the NESC. The Permittee shall address and rectify any induced current problems that arise during transmission line operation.

4.7.2 Electric Field

The transmission line shall be designed, constructed, and operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

4.7.3 Interference with Communication Devices

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the transmission line, the Permittee shall take whatever action is feasible to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the line.

4.8 Other Requirements

4.8.1 Applicable Codes

The Permittee shall comply with applicable NERC planning standards and requirements of the NESC including clearances to ground, clearance to crossing utilities, clearance to buildings, right-of way widths, erecting power poles, and stringing of transmission line conductors.

4.8.2 Other Permits

The Permittee shall comply with all applicable state rules and statutes. The Permittee shall obtain all required permits for the project and comply with the conditions of these permits. A list of the required permits is included in the permit application. The Permittee shall submit a copy of such permits to the Commission upon request.

4.8.3 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this route permit shall be the sole approval required to be obtained by the Permittee for construction of the transmission facilities and this permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

4.8.4 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to identified archaeological and historic resources when installing the high-voltage transmission line on the approved route. In the event that a resource is encountered, the State Historic Preservation Office should be contacted and consulted; the nature of the resource should be identified; and a determination should be made on the eligibility for listing in the National Register of Historic Places. Where feasible, avoidance of the resource is required.

4.8.5 Avian Mitigation

The Permittee's standard transmission design shall incorporate adequate spacing of conductors and grounding devices in accordance with Avian Power Line Interaction Committee standards to eliminate the risk of electrocution to raptors with larger wingspans that may simultaneously come in contact with a conductor and grounding devices.

4.9 Delay in Construction

If the Permittee has not commenced construction or improvement of the route within four years after the date of issuance of this permit the Permittee shall file a report on the failure to construct

and the Commission shall consider suspension of the permit in accordance with Minn. Rules, part 7850.4700.

4.10 Special Conditions

The Permittee shall provide a report to the Commission as part of the plan and profile submission that describes the actions taken and mitigative measures developed regarding the project and the following special conditions.

[Describe any special conditions]

Examples of special conditions included in permits:

- *Avian Mitigation Plan*
- *Environmental Control Plan*
- *Agriculture Mitigation Plan*
- *Vegetation Management Plan*
- *Property Restrictions*
- *Minnesota Department of Natural Resources Requirements*
- *Minnesota Pollution Control Requirements*
- *Minnesota State Historical Preservation Office Requirements*
- *Minnesota Department of Transportation Requirements*

5.0 PERMIT AMENDMENT

This permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required.

6.0 TRANSFER OF PERMIT

The Permittee may request at any time that the Commission transfer this permit to another person or entity. The Permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer.

The person to whom the permit is to be transferred shall provide the Commission with such information as the Commission shall require to determine whether the new Permittee can comply

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with the conditions of the permit. The Commission may authorize transfer of the permit after affording the Permittee, the new Permittee, and interested persons such process as is required.

7.0 REVOCATION OR SUSPENSION OF THE PERMIT

The Commission may initiate action to revoke or suspend this permit at any time. The Commission shall act in accordance with the requirements of Minn. Rules, part 7850.5100, to revoke or suspend the permit.

GENERIC TEMPLATE

**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLAINT HANDLING PROCEDURES FOR
HIGH-VOLTAGE TRANSMISSION LINES**

A. Purpose

To establish a uniform and timely method of reporting complaints received by the permittee concerning permit conditions for site preparation, construction, cleanup and restoration, operation, and resolution of such complaints.

B. Scope

This document describes complaint reporting procedures and frequency.

C. Applicability

The procedures shall be used for all complaints received by the permittee and all complaints received by the Minnesota Public Utilities Commission (Commission) under Minn. Rules, parts 7829.1500 or 7829.1700 relevant to this permit.

D. Definitions

Complaint: A verbal or written statement presented to the permittees by a person expressing dissatisfaction or concern regarding site preparation, cleanup or restoration or other route and associated facilities permit conditions. Complaints do not include requests, inquiries, questions or general comments.

Substantial Complaint: A written complaint alleging a violation of a specific permit condition that, if substantiated, could result in permit modification or suspension pursuant to the applicable regulations.

Unresolved Complaint: A complaint which, despite the good faith efforts of the permittee and a person, remains to both or one of the parties unresolved or unsatisfactorily resolved.

Person: An individual, partnership, joint venture, private or public corporation, association, firm, public service company, cooperative, political subdivision, municipal corporation, government agency, public utility district, or any other entity, public or private, however organized.

E. Complaint Documentation and Processing

1. The permittee shall designate an individual to summarize complaints for the Commission. This person's name, phone number and email address shall accompany all complaint submittals.

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2. A person presenting the complaint should to the extent possible, include the following information in their communications:
 - a. name, address, phone number, and email address;
 - b. date of complaint;
 - c. tract or parcel number; and
 - d. whether the complaint relates to a permit matter or a compliance issue.
3. The permittee shall document all complaints by maintaining a record of all applicable information concerning the complaint, including the following:
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 - c. precise description of property or parcel number;
 - d. name of permittee representative receiving complaint and date of receipt;
 - e. nature of complaint and the applicable permit condition(s);
 - f. activities undertaken to resolve the complaint; and
 - g. final disposition of the complaint.

F. Reporting Requirements

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Immediate Reports: All substantial complaints shall be reported to the Commission the same day received, or on the following working day for complaints received after working hours. Such reports are to be directed to the Commission's Consumer Affairs Office at 1-800-657-3782 (voice messages are acceptable) or consumer.puc@state.mn.us. For e-mail reporting, the email subject line should read "EFP Complaint" and include the appropriate project docket number.

Monthly Reports: By the 15th of each month, a summary of all complaints, including substantial complaints received or resolved during the preceding month, shall be filed to Dr. Burl W. Haar, Executive Secretary, Public Utilities Commission, using the eDockets system. The eDockets system is located at:
<https://www.edockets.state.mn.us/EFiling/home.jsp>

If no complaints were received during the preceding month, the permittee shall submit (eFile) a summary indicating that no complaints were received.

G. Complaints Received by the Commission

Complaints received directly by the Commission from aggrieved persons regarding site preparation, construction, cleanup, restoration, operation and maintenance shall be promptly sent to the permittee.

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H. Commission Process for Unresolved Complaints

Commission staff shall perform an initial evaluation of unresolved complaints submitted to the Commission. Complaints raising substantial permit issues shall be processed and resolved by the Commission. Staff shall notify the permittee and appropriate persons if it determines that the complaint is a substantial complaint. With respect to such complaints, each party shall submit a written summary of its position to the Commission no later than ten (10) days after receipt of the staff notification. The complaint will be presented to the Commission for a decision as soon as practicable.

I. Permittee Contacts for Complaints and Complaint Reporting

Complaints may be filed by mail or email to:

[Permittee Name]
[Permittee Complaint Contact]
[Permittee Address]
[Permittee Telephone Number]
[Permittee Email]

This information shall be maintained current by informing the Commission of any changes by eFiling, as they become effective.

ATTACHMENT []

**MINNESOTA PUBLIC UTILITIES COMMISSION
COMPLIANCE FILING PROCEDURE FOR
PERMITTED ENERGY FACILITIES**

A. Purpose

To establish a uniform and timely method of submitting information required by the Commission energy facility permits.

B. Scope and Applicability

This procedure encompasses all compliance filings required by permit.

C. Definitions

Compliance Filing: A filing of information to the Commission, where the information is required by a Commission site or route permit.

D. Responsibilities

1. The permittee shall eFile all compliance filings with Dr. Burl W. Haar, Executive Secretary, Public Utilities Commission, through the eDockets system. The eDockets system is located at: <https://www.edockets.state.mn.us/EFiling/home.jsp>

General instructions are provided on the eDockets website. Permittees must register on the website to eFile documents.

2. All filings must have a cover sheet that includes:

- a. Date
- b. Name of submitter/permittee
- c. Type of permit (site or route)
- d. Project location
- e. Project docket number
- f. Permit section under which the filing is made
- g. Short description of the filing

3. Filings that are graphic intensive (e.g., maps, engineered drawings) must, in addition to being eFiled, be submitted as paper copies and on CD. Paper copies and CDs should be sent to: 1) Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, 121 7th Place East, Suite 350, St. Paul, MN 55101-2147, and 2) Department of Commerce, Energy Facility Permitting, 85 7th Place East, Suite 500, St. Paul, MN 55101-2198.

The Commission may request a paper copy of any eFiled document.

[Month] [Year] [Docket No.]

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ATTACHMENT []

PERMIT COMPLIANCE FILINGS¹

PERMITTEE:

PERMIT TYPE:

PROJECT LOCATION:

PUC DOCKET NUMBER:

Filing Number	Permit Section	Description of Compliance Filing	Due Date

¹ This compilation of permit compliance filings is provided for the convenience of the permittee and the Commission. It is not a substitute for the permit; the language of the permit controls.

[Month] [Year] [Docket No.]

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Appendix C2

Example Route Permit

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION
ROUTE PERMIT FOR CONSTRUCTION OF A HIGH-VOLTAGE TRANSMISSION
LINE AND ASSOCIATED FACILITIES

IN
ROSEAU, LAKE OF THE WOODS, BELTRAMI,
KOOCHICHING AND ITASCA COUNTIES

ISSUED TO
MINNESOTA POWER

PUC DOCKET NO. E015/TL-14-21

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850, this route permit is hereby issued to:

MINNESOTA POWER

Minnesota Power is authorized by this route permit to construct and operate a single-circuit 500-kilovolt alternating current High Voltage Transmission Line and associated facilities from the U.S./Canada International Border in Roseau County to a new substation near the existing Blackberry Substation in Itasca County.

The transmission line and associated facilities shall be built within the route identified in this permit and as portrayed on the official route maps, and in compliance with the conditions specified in this permit.

Approved and adopted this 11th day of April, 2016

BY ORDER OF THE COMMISSION

Daniel P. Wolf,
Executive Secretary

This document can be made available in alternative formats (i.e., large print or audio) by calling 651-296-0406 (voice). Persons with hearing or speech disabilities may call us through their preferred Telecommunications Relay Service.

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FIGURES

Route Maps

Exhibit B - Anticipated Alignment Changes for the Effie Variation

ATTACHMENTS

- Attachment A - Table of Township, Range and Section Data for the approved route
- Attachment B - Complaint Procedures
- Attachment C - Compliance Filing Schedule

1.0 ROUTE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this route permit to Minnesota Power (Permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7850. This permit authorizes Minnesota Power to construct a single-circuit 500-kilovolt alternating current (AC) High Voltage Transmission Line from the U.S./Canada International Border in Roseau County to a new substation near the existing Blackberry Substation in Itasca County, and as identified in the attached route permit maps, hereby incorporated into this document.

2.0 PROJECT DESCRIPTION

Minnesota Power proposed construction and operation of the Great Northern Transmission Line, which is an approximately 224-mile, 500 kilovolt (kV) overhead, single-circuit, alternating current (AC) transmission line. The transmission line would cross the U.S. and Canada Border in Roseau County, Minnesota and connect into the proposed Iron Range 500 kilovolt Substation adjacent to the existing Blackberry Substation near Grand Rapids, Minnesota.

The project also includes associated substation facilities and transmission system modifications at the Blackberry Substation site, construction of a new 500 kV series compensation station, necessary access roads, construction lay-down areas and fly-in sites. A new Iron Range 500 kV Substation for the project will be constructed east of the existing Blackberry 230/115 kV Substation.

The transmission line is expected to carry at least 750 megawatts (MW) to facilitate agreements and transmission service requests between Minnesota Power and Manitoba Hydro plus exports and transmission service requests by Manitoba to other utilities.

2.1 Project Location

The approved transmission line will cross the U.S. / Canadian border at latitude 49 00 00.00 N and longitude 95 54 50.49 W, approximately 2.9 miles east of Highway 89 in Roseau County. The transmission line would cross the border between the U.S. and Canada in Roseau County, Minnesota, and connect into the proposed Iron Range 500 kilovolt (kV) Substation adjacent to the existing Blackberry Substation near Grand Rapids, Minnesota. The route includes locations in Roseau, Lake of the Woods, Koochiching, and Itasca Counties.

2.2 Associated Facilities and Substations

The project includes construction of associated facilities including the proposed Iron Range 500 kV Substation, a new 500 kV Series Compensation Station, and three regeneration stations with permanent and temporary access roads. Additionally, construction of the proposed Project would require temporary and permanent access roads, temporary laydown areas, temporary stringing areas, and temporary fly-in sites.

The project includes the expansion of the site of the Permittee's existing 8.8 acre Blackberry 230/115 kV Substation near Grand Rapids, Minnesota to incorporate the new Iron Range 500 kV Substation. It will be constructed adjacent to and east of the existing Blackberry Substation and is expected to permanently impact approximately 23 acres. The Iron Range 500 kV Substation would accommodate the new 500 kV transmission line, existing 230 kV transmission lines, and all associated 500 kV and 230 kV equipment.

The Permittee will locate a new 500 kV Series Compensation Station within or adjacent to the approved route. The precise location for the 500 kV Series Compensation Station will be determined by electric design optimization studies and final route selection, but is anticipated to be located at the approximate midpoint between the existing Dorsey Substation in Canada and the proposed Iron Range 500 kV Substation located just east of the existing Blackberry Substation. The Series Compensation Station will permanently impact approximately 6 acres.

The Permittee is permitted to locate three regeneration stations within or adjacent to the approved route. The sites would be 75 feet by 75 feet and located on upland areas. The Permittee will construct temporary access roads within the right-of-way for construction. The Permittee will work with local property owners to identify suitable access locations during final design. The typical width of the temporary access road will be 16 feet.

The Permittee intends to establish a permanent "2-track" trail on uplands within the permanent right-of-way as a result of construction traffic. This 2-track trail would be unimproved and it is assumed that there will be no grading or filling for this permanent access.

The Permittee is permitted to establish a main staging area for temporary storage of materials and equipment. There would be other temporary staging areas located along the approved right-of-way for laydown and framing prior to structure installation. The laydown areas would be approximately 20 to 40 acres, and would be located along suitable roadways approximately 40 to 50 miles apart, and would be within 5 miles from the approved route. Upland areas with prior disturbance will be preferred; however other areas may be approved as part of the plan and profile process in instances where this is not feasible. These yards would be in place for at least

one year and used to store equipment and materials and include the construction offices. The Permittee will identify specific staging areas during final design.

The Permittee may establish temporary stringing sites within or adjacent to the approved route. The sites would be approximately 2.8 acres in size and spaced approximately 2 miles apart.

The Permittee is allowed to establish fly-in sites that would be approximately 10 acres in size, located as near to the right-of-way as possible, and approximately 5 to 7 miles apart. These sites may be in place for up to 1 year to assemble structures for helicopter (sky crane) construction. Upland areas with prior disturbance will be preferred; however, there may be some areas where this is not feasible and other areas would be used. The Permittee will identify fly-in sites during final design.

2.3 Structures and Conductors

The project will be located in new right-of-way that would be approximately 200 feet wide. A wider right-of-way may be required for certain spans of the project, at angle and corner structures, for guyed structures, or where special design requirements are dictated by topography. The Permittee is evaluating several steel structure types and configurations including a self-supporting lattice structure, a lattice guyed-V structure, and a lattice guyed-delta structure.

The transmission towers will be steel lattice structures for the majority of the route, with the exact type of structure in any given location dependent on land type, land use, and potential effect on the surrounding landscape.

The transmission tower heights will range from approximately 100 to 170 feet. In some locations, such as where the project crosses an existing transmission line, taller structures may be required. None of the structures are anticipated to be taller than 200 feet in order to meet Federal Aviation Administration (FAA) lighting standards. Approximately 4 to 5 structures are anticipated per mile of transmission line and the structures would be placed approximately 1,000 to 1,700 feet apart, with a maximum span of 1,700 feet. Where the transmission line crosses farmland, the Permittee will use self-supporting lattice structures to minimize interference with farm operations. The area of permanent impact for the guyed structures is anticipated to be 1,936 square feet per structure, with a temporary construction disturbance footprint of approximately 0.92 acres per structure.

The table below details specifics on the various structure types as presented in the route permit application.

Line Type	Conductor	Structure		Foundation	Height	Span
		Type	Material			
Single-Circuit 500 kV AC overhead transmission line	Aluminum Conductor Steel Reinforced (ACSR)	3-conductor bundle 1192.5 kcmil ACSR with 18 inch sub-spacing	NESC approved ACSR rated for 500 kV operation	Self-supporting lattice and guyed-V structures	100-170 feet	Approximately 1,000 to 1,450 feet (0.20-0.25 miles)

The transmission line and associated facilities shall be designed to meet or exceed all relevant local and state codes, the National Electric Safety Code (NESC), and North American Electric Reliability Corporation (NERC) requirements. This includes standards relating to clearances to ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances over roadways, right-of-way widths, and permit requirements. The transmission line shall be equipped with protective devices to safeguard the public if an accident occurs.

3.0 DESIGNATED ROUTE

The route designated by the Commission in this permit is the route described below and shown on the route maps attached to this permit. Enclosed as Attachment A is a summary of Township, Range and Section data of the project. The route is generally described as follows:

The location of the international border crossing at the U.S. / Canadian border is located at latitude 49 00 00.00 N and longitude 95 54 50.49 W, approximately 2.9 miles east of Highway 89 in Roseau County.

The approved route proceeds southeast 0.5 miles to 410th Street, approximately 0.16 of a mile from the intersection of 410th Street and County Road 3. The approved route travels south 2 miles to 390th Street and turn east following 390th Street for 10.5 miles (where 390th street then turns into County Road 118). At 0.25 miles from Highway 310 further east the approved transmission line would turn southeast and continue for another 12 miles. At 0.5 miles from 510th Avenue further southeast the approved transmission line would again turn and travel 2.3 miles east to join the existing Minnkota Power 230 kV transmission line. The proposed Project would parallel the existing Minnkota Power 230 kV transmission line southeast for 1.8 miles and then turn south where it would meet the existing Xcel Riel-Forbes 500 kV transmission line. Further southeast and beginning at a tenth of mile north of US Highway 11, the proposed

transmission line would parallel the existing Xcel 500 kV transmission line route for 36 miles after which it would turn east, leaving the Xcel 500 kV transmission line 2 miles southeast of the intersection of Faunce Forest Road and 19th Street Southwest in Lake of the Woods County (the Proposed Blue Route enters the Central Section in this location).

The approved route proceeds east for 5.8 miles and then turn northeast to rejoin the existing Minnkota Power 230 kV transmission line at its intersection with Pitt Grade Trail. The proposed transmission line would then parallel this existing 230 kV transmission line in an easterly direction for 31 miles to a point 1.5 miles west of County Road 86 in Koochiching County where it would then proceed southeast for 8.3 miles and then south for 1.8 miles. At this point, the proposed Project would be roughly 1.5 miles south from the intersection of County Road 32 and County Road 36 in Koochiching County. The transmission line would then continue southeast for 21.3 miles and intersect Highway 71 roughly 4.5 miles northeast of Big Falls, where it would continue an additional 9.6 miles to the southeast where it would rejoin the existing Minnkota Power 230 kV and Xcel Riel – Forbes 500 kV transmission lines (230/500 Corridor). The transmission line continues southeast approximately 0.9 miles and then proceeds in an east-southeasterly direction following the 230/550 Corridor for approximately 11.1 miles as it crosses Forest Road 138. The transmission lines proceed in a southeasterly direction for approximately 6.9 miles. The project continues south along the 230/550 Corridor for approximately 7.0 miles, proceeds approximately 1.0 miles to the southwest. The project continues to follow the 230/500 Corridor for approximately 13.8 miles until the 230/550 Corridor proceeds to the southeast in Township 59N, Range 23W, Section 12 in Itasca County. The approved route then exits the 230/500 kV Corridor and proceeds in a south by southwest direction for approximately 4.5 miles where it connects with the Proposed Orange Route in Township 59N, Range 23W and Section 34 and proceeds by southwest for approximately 3.3 miles and then proceeds southwest until it joins the Proposed Blue Route in Township 58N, Range 23W and Section 20.

The identified route widths will provide the Permittee with flexibility for minor adjustments of the specific alignment or right-of-way to accommodate landowner requests and unforeseen conditions. The final alignment (i.e., permanent and maintained rights-of-way) will be located within this designated route unless otherwise authorized below.

3.1 Right-of-Way

The approved route varies from 650 to 3,000 feet wide in order to provide flexibility during detailed design to try to accommodate landowner's preferences once the route is selected by the Commission. The approved route widths with anticipated alignments are shown on the detailed maps provided in Volume II: Part 3, Appendix S of the Final Environmental Impact Statement for the project.

The approved right-of-way width for the project is up to 200 feet. This permit anticipates that the right-of-way will generally conform to the anticipated alignment as noted on the attached route permit maps unless changes are requested by individual landowners and agreed to by Permittee or for unforeseen conditions that are encountered or are otherwise provided for by this permit. The anticipated alignment may be modified to incorporate changes identified by Minnesota Power (Exhibit B to its Exceptions filing, January 19, 2016, E-Dockets No. 20161-117422-04, enclosed).

Any alignment modifications within the designated route shall be located so as to have comparable overall impacts relative to the factors in Minn. R. 7850.4100, as does the alignment identified in this permit, and shall be specifically identified and documented in and approved as part of the plan and profile submitted pursuant to section 4.1 of this permit.

Where the transmission line route parallels existing highway and other road rights-of-way, the transmission line right-of-way shall occupy and utilize the existing right-of-way to the maximum extent possible, consistent with the criteria in Minn. R. 7850.4100, the other requirements of this permit, and for highways under the jurisdiction of the Minnesota Department of Transportation (Mn/DOT) rules, policies, and procedures for accommodating utilities in trunk highway rights-of-way.

4.0 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction of the transmission line and associated facilities over the life of this permit.

4.1 Plan and Profile

At least 30 calendar days before right-of-way preparation for construction begins on any segment or portion of the project, the Permittee shall provide the Commission with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, structure specifications and locations, cleanup, and restoration for the transmission line. The documentation shall include maps depicting the plan and profile including the right-of-way, alignment, and structures in relation to the route and alignment approved per this permit.

The Permittee may not commence construction until the 30 days has expired or until the Commission has advised the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this permit. If the Permittee intends to make any significant changes in its plan and profile or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission at least

five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this permit.

4.2 Construction Practices

The Permittee shall follow those specific construction practices and material specifications described in Minnesota Power's Application to the Commission for a route permit for the Great Northern Transmission Line Project dated April 15, 2014, unless this permit establishes a different requirement in which case this permit shall prevail.

4.2.1 Field Representative

At least 14 days prior to commencing construction, the Permittee shall advise the Commission in writing of the person or persons designated to be the field representative for the Permittee with the responsibility to oversee compliance with the conditions of this permit during construction.

The field representative's address, phone number, emergency phone number, and email shall be provided to the Commission and shall be made available to affected landowners, residents, public officials and other interested persons. The Permittee may change the field representative at any time upon written notice to the Commission to affected landowners, residents, public officials, and other interested persons.

4.2.2 Local Governments

During construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these would be temporary and the Permittee will restore service promptly. Where any impacts to public utilities have the potential to occur the Permittee will work with both landowners and local agencies to determine the most appropriate transmission structure placement.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction.

4.2.3 Cleanup

All waste and scrap that is the product of construction shall be removed from the area and properly disposed of upon completion of each task. Personal litter, including bottles, cans, and paper from construction activities shall be removed on a daily basis.

4.2.4 Noise

Construction and routine maintenance activities shall be limited to daytime working hours, as defined in Minn. R. 7030.0200, to ensure nighttime noise level standards will not be exceeded.

4.2.5 Vegetation Removal

The Permittee shall minimize the number of trees to be removed in selecting the right-of-way specifically preserving to the maximum extent practicable windbreaks, shelterbelts, living snow fences, and vegetation in areas such as trail and stream crossings where vegetative screening may minimize aesthetic impacts, to the extent that such actions do not violate sound engineering principles or system reliability criteria.

Tall growing species located within the transmission line right-of-way that endanger the safe and reliable operation of the transmission facility will be removed by the Permittee. The Permittee shall leave undisturbed, to the extent possible, existing low growing species in the right-of-way or replant such species in the right-of-way to blend the difference between the right-of-way and adjacent areas, to the extent that the low growing vegetation that will not pose a threat to the transmission facility or impede construction.

The Permittee shall avoid construction and maintenance practices, particularly the use of fertilizer, herbicides or other pesticides that are inconsistent with the landowner's or tenant's use of the land. The Permittee will provide notification to affected landowners and tenants before using these materials.

4.2.6 Application of Herbicides

The Permittee shall restrict herbicide use to those herbicides and methods of application approved by the Minnesota Department of Agriculture and the U.S. Environmental Protection Agency. Selective foliage or basal application shall be used when practicable. The Permittee shall contact the landowner or his designee to obtain approval for the use of herbicide prior to any application on their property. The landowner may request that there be no application of herbicides on any part of the right-of-way within the landowner's property. All herbicides shall be applied in a safe and cautious manner so as not to damage crops, orchards, tree farms, or gardens. The Permittee shall provide notice of herbicide application to known beekeepers operating apiaries within one mile of the project site at least 14 days prior to such application.

4.2.7 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners or land management agencies prior to final location of structures, rights-of-way, and other areas with the potential for visual disturbance. Care shall be used to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the project during construction and maintenance. Structures shall be placed at a distance, consistent with sound engineering principles and system reliability criteria, from intersecting roads, highway, or trail crossings and could cross roads to minimize or avoid impacts.

4.2.8 Soil Erosion and Sediment Control

The Permittee shall implement those erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency (MPCA) Construction Stormwater Program.

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the facilities shall be returned to pre-construction conditions.

When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall consult with landowners on the selection and use of seed for replanting.

In accordance MPCA, the Permittee shall obtain a National Pollutant Discharge Elimination System (NPDES)/State Disposal System (SDS) Construction Stormwater permit from the MPCA.

4.2.9 Wetlands and Water Resources

Wetland impact avoidance measures that shall be implemented during design and construction of the transmission line will include spacing and placing the power poles at variable distances to span and avoid wetlands, watercourses, and floodplains.

Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, construction in wetland areas shall occur during frozen ground conditions. When construction during winter is not possible, wooden or composite mats shall be used to protect wetland vegetation. Soil excavated from the wetlands and riparian areas shall be contained and not placed back into the wetland or riparian area.

Wetlands and riparian areas shall be accessed using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts. No staging or stringing set up areas shall be placed within or adjacent to wetlands or water resources, as practicable. Power pole structures shall be assembled on upland areas before they are brought to the site for installation. Areas disturbed by construction activities shall be restored to pre-construction conditions.

All requirements of the U.S. Army Corps of Engineers (wetlands under federal jurisdiction), Minnesota Department of Natural Resources (Public Waters/Wetlands), and County (wetlands under the jurisdiction of the Minnesota Wetland Conservation Act) shall be met.

As part of preconstruction reports, the Permittee will include a section evaluating the potential for the occurrence of Aquatic Invasive Species (AIS) in the project area and describing if any best management practices that apply to the project. The Permittee should identify any infested waters or otherwise indicate that aquatic invasive species are not anticipated. The MN DNR must be notified if any AIS are identified in an area not previously identified as infested water.

4.2.10 Noxious Weeds

The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall consult with landowners on the selection and use of seed for replanting.

4.2.11 Roads

The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city or township roads that will be used during the construction phase of the project. Where practical, existing roadways shall be used for all activities associated with

construction of the solar facility. Oversize or overweight loads associated with the facility shall not be hauled across public roads without required permits and approvals.

The Permittee shall construct the least number of site access roads it can. Access roads shall not be constructed across streams and drainage ways without the required permits and approvals. Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits.

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when obtaining access to the site, unless otherwise negotiated with the affected landowner.

4.2.12 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to identified archaeological and historic resources when installing the high-voltage transmission line on the approved route. In the event that a resource is encountered, the Permittee shall contact and consult with the State Historic Preservation Office (SHPO). Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an effort to minimize project impacts on the resource consistent with SHPO and State Archaeologist requirements.

Because of the federal decisions required for the Project, review of the Project and consultation with tribes and agencies under Section 106 of the National Historic Preservation Act is required. In light of the significant consultation with potentially affected parties and responsible agencies, the Permittee must defer to the Programmatic Agreement and advise the Commission when the measures to avoid, minimize or mitigate adverse effects to cultural resource and environmental justice impacts identified in the Record of Decision have been fulfilled.

Prior to construction, workers shall be trained about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction.

4.2.13 Avian Mitigation

The Permittee's standard transmission design shall incorporate adequate spacing of conductors and grounding devices in accordance with Avian Power Line Interaction Committee standards to eliminate the risk of electrocution to raptors with larger wingspans that may simultaneously come in contact with a conductor and grounding devices.

The Permittee will consult with the Minnesota Department of Natural Resources regarding type and placement of bird diverters.

4.2.14 Temporary Work Space

The Permittee shall limit temporary easements to special construction access needs and additional staging or lay-down areas required outside of the authorized right-of-way. Temporary space shall be selected to limit the removal and impacts to vegetation. Temporary easements outside of the authorized transmission line right-of-way will be obtained from affected landowners through rental agreements and are not provided for in this permit.

Temporary driveways may be constructed between the roadway and the structures to minimize impact using the shortest route possible. Construction mats should also be used to minimize impacts on access paths and construction areas.

4.2.15 Restoration

The Permittee shall restore the right-of-way, temporary work spaces, access roads, abandoned right-of-way, and other public or private lands affected by construction of the transmission line. Restoration within the right-of-way must be compatible with the safe operation, maintenance, and inspection of the transmission line. Within 60 days after completion of all restoration activities, the Permittee shall advise the Commission in writing of the completion of such activities.

The Permittee shall fairly compensate landowners for damage to crops, fences, landscaping, drain tile, or other damages sustained during construction.

4.2.16 Pollution and Hazardous Wastes

All appropriate precautions to protect against pollution of the environment must be taken by the Permittee. The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean up and disposal of all wastes generated during construction and restoration of the right-of-way.

4.2.17 Notification

Before entering a landowner's property for construction or maintenance, the Permittee shall notify landowners or their designee(s) at least 14 but not greater than 60 days in advance.

4.2.18 Notice of Permit

The Permittee shall inform all employees, contractors, and other persons involved in the transmission line construction of the terms and conditions of this permit.

4.3 Periodic Status Reports

The Permittee shall report to the Commission on progress regarding finalization of the route, design of structures, and construction of the transmission line. The Permittee need not report more frequently than monthly.

4.4 Complaint Procedures

Prior to the start of construction, the Permittee shall submit to the Commission the procedures that will be used to receive and respond to complaints. The procedures shall be in accordance with the requirements set forth in the complaint procedures attached to this permit.

4.5 Permit Distribution and Notification

Within 30 days of permit issuance, the Permittee shall provide all affected landowners with a copy of this permit and the complaint procedures. In no case shall the landowner receive this route permit and complaint procedures less than five days prior to the start of construction on their property. The Permittee shall contact landowners prior to entering the property or conducting maintenance along the route. The Permittee shall work with landowners to locate the high-voltage transmission line to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads.

At the time of first contact, the Permittee shall also provide all affected landowners with a copy of the Department of Commerce's Rights-of-Way and Easements for Energy Facility Construction and Operation fact sheet.¹

4.6 Completion of Construction

4.6.1 Notification to Commission

¹ http://mn.gov/commerce/energyfacilities/documents/Easements%20Fact%20Sheet_08.05.14.pdf

At least three days before the line is to be placed into service, the Permittee shall notify the Commission of the date on which the line will be placed into service and the date on which construction was complete.

4.6.2 As-Built Specifications

Within 60 days after completion of construction, the Permittee shall submit copies of all final as-built plans and specifications developed during the project.

4.6.3 GPS Data

Within 60 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (e.g., ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the transmission line and each substation connected.

4.7 Electrical Performance Standards

4.7.1 Grounding

The Permittee shall design, construct, and operate the transmission line in a manner so that the maximum induced steady-state short-circuit current shall be limited to five milliamperes root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the right-of-way, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short-circuit current between ground and the object so as not to exceed one milliamperes rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the NESC. The Permittee shall address and rectify any induced current problems that arise during transmission line operation.

4.7.2 Electric Field

The transmission line shall be designed, constructed, and operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

4.7.3 Interference with Communication Devices

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the transmission line, the Permittee shall take whatever action is feasible to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the line.

4.8 Other Requirements

4.8.1 Applicable Codes

The Permittee shall comply with applicable NERC planning standards and requirements of the NESC including clearances to ground, clearance to crossing utilities, clearance to buildings, right-of way widths, erecting power poles, and stringing of transmission line conductors.

When triple paralleling lines within the permitted route width, lines shall be located in compliance with above standards and in compliance with other permits or licenses, recognizing safety, access and operating and maintenance issues for all impacted lines regardless of ownership. Permittee shall consult with Minnesota DNR regarding forestry and other potential corridor impacts prior to submitting the Plan and Profile for review by the Department and the Commission.

4.8.2 Other Permits

The Permittee is required to work in continued consultation with applicable state and federal agencies, including the MNDNR and USFWS, to obtain approval for all required permits for this Project. The Permittee must comply with conditions of any permits. The Permittee must submit documentation of permit compliance to the Commission upon request.

4.8.3 Pre-emption

Pursuant to Minn. Stat. § 216E.10, this route permit shall be the sole approval required to be obtained by the Permittee for construction of the transmission facilities and this permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

4.9 Delay in Construction

If the Permittee has not commenced construction or improvement of the route within four years after the date of issuance of this permit, the Permittee shall file a report on the failure to construct and the Commission shall consider suspension of the permit in accordance with Minn. R. 7850.4700.

5.0 SPECIAL CONDITIONS

The Permittee shall provide a report to the Commission as part of the plan and profile submission that describes mitigation actions and measures developed and status of the following special conditions. Special conditions shall take precedence over other conditions of this permit should there be a conflict.

5.0.1 Construction Environmental Control Plan (CECP)

The Permittee shall develop a Construction Environmental Control Plan (CECP) that shall include all environmental control plans and special conditions imposed by permits or licenses issued by state or federal agencies related to agency-managed resources. Plans within the CECP shall include, but not be limited to, the Agricultural Impact Mitigation Plan, the Avian Mitigation Plan, the Vegetation Management Plan, and a Stormwater Pollution Prevention Plan. The CECP shall be filed with the Commission as a compliance filing 30 days prior to submitting the plan and profile for any segment of the Project.

The Permittee shall provide dedicated independent environmental inspectors and monitors to oversee the construction process and to monitor compliance with 1) the Vegetation Management Plan, 2) the Avian Mitigation Plan, and 3) the requirements of this and all other environmental permits with the exception of the Mineral Resource Plan.

5.0.2 Avian Mitigation Plan and Bird Flight Diverters

Avian Mitigation Plan. The Permittee shall develop an Avian Mitigation Plan (AMP). The AMP shall be developed in consultation with the MNDNR. The Permittee shall submit and implement the plan in accordance with the CECP for the Project. The Purpose of the AMP shall be to identify site-specific risks to avian species from the Project and to identify and implement strategies to avoid and mitigate potential impacts to these species, including but not limited to, the use of bird flight diverters. The AMP shall include documentation of the Permittee's consultation with the MNDNR and the USFWS.

5.0.3 Agriculture Impact Mitigation Plan

The Permittee shall comply with the Agricultural Impact Mitigation Plan (AIMP) prepared for this Project and approved by the Minnesota Department of Agriculture. The Applicant/Permittee shall distribute the AIMP with the route permit to all affected landowners.

5.0.4 Vegetation Management Plan

The Permittee must develop a Vegetation Management Plan (VMP). The VMP shall be developed in consultation with the MNDNR. The purpose of the VMP shall be to identify measures to minimize the disturbance and removal of vegetation for the Project, prevent the introduction of noxious weeds and invasive species, and re-vegetate disturbed non-cropland areas with appropriate native species in cooperation with landowners and state, federal, and local resource agencies, in such a way that does not negatively impact the safe and reliable operation of the Project. The Permittee shall submit the VMP with the CECP and monitor compliance with the VMP.

5.0.5 Consultation with the United States Fish and Wildlife Service (USFWS)

The Permittee is required to develop avoidance, mitigation and conservation measures for the protection of federally-listed species (including critical habitats) and for migratory birds with the USFWS under Section 7 of the Endangered Species Act. The Permittee is required to document this consultation as part of the Periodic Status Reports.

5.0.6 Mineral Resource Plan

The Permittee must develop a Mineral Resource Plan (MRP). The Permittee shall consult with the MNDNR regarding the scope and content of the MRP. The purpose of the MRP will be to identify measures to avoid interference with the exploration or mining operations conducted on state-owned mining units. The MRP would include (1) General description of state-owned mineral resources in the project area; and (2) Documentation of consultation with the MNDNR regarding measures to avoid interference with exploration and encumbrance of state-owned minerals. The Mineral Resource Plan shall be submitted as a compliance filing 30 days prior to the Plan and Profile submittals.

6.0 PERMIT AMENDMENT

This permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required.

7.0 TRANSFER OF PERMIT

The Permittee may request at any time that the Commission transfer this permit to another person or entity. The Permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer.

The person to whom the permit is to be transferred shall provide the Commission with such information as the Commission shall require to determine whether the new Permittee can comply with the conditions of the permit. The Commission may authorize transfer of the permit after affording the Permittee, the new Permittee, and interested persons such process as is required.

8.0 REVOCATION OR SUSPENSION OF THE PERMIT

The Commission may initiate action to revoke or suspend this permit at any time. The Commission shall act in accordance with the requirements of Minn. R. 7850.5100, to revoke or suspend the permit

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Appendix D

Agricultural Impact Mitigation Plan (AIMP)



**Xcel Energy
ITC Midwest LLC
Agricultural Impact Mitigation Plan
Huntley Wilmarth 345 kV
Transmission Project and Associated Facilities
in Blue Earth, Nicollet, Martin, and Faribault
Counties**

Docket Nos. E002, ET6675/CN-17-184 & E002, ET6675/TL-17-185

September 12, 2018

Introduction

Northern States Power Company, doing business as Xcel Energy (“Xcel Energy”), and ITC Midwest LLC (“ITC Midwest”) (collectively, the “Companies”) developed this Agricultural Impact Mitigation Plan (“AIMP”) with the Minnesota Department of Agriculture (“MDA”) in compliance with Minnesota Statutes Section 216E.10, subdivision 3(b). The Companies are jointly seeking a Certificate of Need and Route Permit from the Minnesota Public Utilities Commission to construct the Huntley Wilmarth 345 kV Transmission Project in Nicollet, Blue Earth, Martin, and Faribault counties, Minnesota (“Project”). The Companies have agreed that Xcel Energy will obtain easements and construct the Project on behalf of the Companies. Therefore, when Xcel Energy is referenced in this AIMP, Xcel Energy is acting on behalf of both Companies. The AIMP identifies measures Xcel Energy will take during construction to avoid, mitigate, minimize, repair, or provide compensation for impacts on Agricultural Land. The AIMP and its provisions will be implemented during construction and restoration activities that Xcel Energy undertakes for the Project prior to filing notice of completion of construction with the Minnesota Public Utilities Commission.

Capitalized words and other defined terms have the meanings given to them in this AIMP and its appendix. Use of “Landowner” in this AIMP may be construed to read “Landowner and/or Tenant.”

This AIMP and its construction standards and policies apply only to construction activities occurring on privately owned Agricultural Land. If agricultural tile is encountered, whether on Non-Agricultural Land or Agricultural Land, Xcel Energy will implement construction standards relating to the repair of tile on Agricultural Lands discussed further in this AIMP. Portions of this AIMP that identify standards and policies as they apply to Organic Agricultural Land apply only to the types of lands defined in the National Organic Program Rules (7 C.F.R. Parts 205.100; 205.101, and 205.202). Further, construction standards and policies identified in this AIMP can be modified through Easement or other agreement between the Companies and the Landowner of Agricultural Land, as appropriate. In such case, the Easement or other agreement will control.

Generally

Xcel Energy will negotiate in good faith with each Landowner of Agricultural Land to secure an agreement containing the conditions or provisions necessary to implement the provisions of this AIMP. The mitigative actions set forth in this AIMP are subject to negotiation and approval or change by Landowner of Agricultural Land, so long as such changes are negotiated with and acceptable to Xcel Energy. Mitigative actions will be executed by Xcel Energy employees or by qualified contractors retained by Xcel Energy,

unless otherwise specified or agreed upon by Landowner. Xcel Energy and Landowner may agree that certain activities will be performed by Landowner.

Unless otherwise specified in this AIMP or in an Easement or other agreement negotiated between the Companies and Landowner, construction standards and policies or mitigative actions will be implemented within 90 days after completion of Final Clean-up activities on Agricultural Land. Weather conditions or other circumstances identified by mutual agreement between Landowner and Xcel Energy may delay implementation of mitigative actions after final clean-up. Where Xcel Energy determines it is practicable, Xcel Energy may make temporary repairs. These temporary repairs may be made to minimize additional property damage or interference with the Landowner's access to the subject Agricultural Land or to comply with Federal or State permits and regulations.

Xcel Energy or its contractors will implement the construction standards and policies or mitigative actions identified within this AIMP so long as such activities do not conflict with any applicable Federal or State rules, regulations, permits, licenses, approvals, or conditions obtained by the Companies for the Project. Should any activity within this AIMP be determined to be unenforceable due to Federal or State rules, regulations, permits, licenses, approvals, or conditions, Xcel Energy will inform the Landowner and will identify a reasonable alternative activity.

Prior to Right-of-Way preparation or construction, Xcel Energy will make a good faith effort to provide each Landowner with contact information, including a phone number and address that can be used to contact Xcel Energy regarding any impacts to Agricultural Land or other construction-related concern or question. Xcel Energy will provide updated information to the Landowner within a reasonable time of any change to Xcel Energy's contacts.

Construction Standards

Mitigative Actions

Xcel Energy will reasonably restore and/or compensate Landowner, as appropriate, for damages caused by Xcel Energy as a result of transmission line construction, and as outlined in this AIMP. Xcel Energy will decide whether to restore land and/or compensate Landowner after a discussion with the Landowner.

Advance Notice of Access

Xcel Energy will make good faith efforts to provide notice to the Landowner in advance of the commencement of initial construction activities on Agricultural Land. Notice may include personal contact, email, letter, or telephone contact.

Environmental/Agricultural Monitor

Xcel Energy will hire an Environmental /Agricultural Monitor to act as an independent third party to monitor compliance with this AIMP and other permit conditions/regulatory requirements. Xcel Energy will work with the MDA to select the Environmental/Agricultural Monitor.

Xcel Energy will coordinate with the Department of Agriculture in developing a list of potential contractors and written specifications for minimum experience and qualifications. After the MDA and Xcel Energy agree on minimum qualifications and list of potential contractors, Xcel Energy will solicit bids from the list of potential contractors and will prepare a summary of bids. Xcel Energy will then meet with MDA to review the bids and agree on which of the bids should be pursued. The contract signed by Xcel Energy and the winning bidder will specify minimum qualifications for Environmental/Agricultural Monitors and will direct the selected contractor to communicate independently with the MDA and set up a reporting relationship as the MDA instructs.

The Environmental/Agricultural Monitor will audit the Companies' compliance with this AIMP. While the Environmental/Agricultural Monitor will not have the authority to direct construction activities and will not have authority to stop construction, if the Environmental /Agriculture Monitor observes a significant non-compliant activity it will be reported to Xcel Energy immediately. The MDA may also instruct the Environmental /Agriculture Monitor to report non-compliant activities to the MDA. If after reviewing the non-compliant activity and if judgement is made that continuing the activity will cause damage to the environment or agricultural land, Xcel Energy would issue a stop work order.

Specific duties of the Environmental/Agricultural Monitor will include, but are not limited to the following:

1. Participate in preconstruction training activities sponsored by Xcel Energy.
2. Monitor construction and restoration activities on Agricultural Land for compliance with provisions of this AIMP. The monitor will be allowed full access to the Agricultural Land where construction occurs.
3. Report instances of noncompliance with the AIMP to the Companies and the MDA.
4. Coordinate with the MDA to develop a reporting structure and report directly to the MDA on events or schedule as agreed upon with the MDA.
5. Coordinate communication of Landowner concerns to the MDA, if necessary.

6. Maintain a written log of Landowner concerns observed or reported by Xcel Energy's construction or land rights agents regarding compliance with this AIMP. The written log should record whether the Environmental/ Agricultural Monitor reported each logged concern to the MDA.
7. Be responsible for determining whether weather conditions have caused the soil to become so wet that the activity to alleviate compaction would reduce the future production capacity of the land and advising Xcel Energy of these conditions. Xcel Energy will be solely responsible in making the decision on whether it will proceed with construction under these conditions. Compensation for Landowner, as appropriate, will be determined as described in the "Procedures for Determination of Damages and Compensation" section of this AIMP.
8. In disputes between Xcel Energy and a Landowner over restoration, advise the MDA on whether the agricultural restoration is reasonably adequate in consultation with Xcel Energy.

Qualifications and Selection of the Environmental/Agricultural Monitor

The Companies' Environmental/ Agricultural Monitor will:

1. Have demonstrated practical experience with pipeline or electric transmission line construction and restoration on Agricultural Land.
2. Be responsible for verifying the Companies' compliance with provisions of this AIMP during construction.
3. If work is being performed on Organic Agricultural Land, the Environmental /Agricultural Monitor will be trained, in organic inspection, by the Independent Organic Inspectors Association, unless the Environmental/ Agricultural Monitor received such training during the previous three years.
4. Work collaboratively with other members of Xcel Energy's team in achieving compliance with this AIMP.
5. Observe construction activities on Agricultural Land on a regular basis.
6. Work with construction crews to assure all practices are in compliance with the provisions of this AIMP.
7. Document instances of noncompliance and work with construction personnel to identify and implement appropriate corrective actions as needed.
8. Provide construction personnel with training on provisions of this AIMP before construction begins.

9. Provide construction personnel with field training on specific topics as needed.

Pole Placement

During the design of the Project, Xcel Energy's engineering, real estate, and permitting staff will seek input from Landowner, as practicable, to address pole placement issues. Prior to construction, the land rights agents will review the planned pole locations with the Landowner when requested to do so by the Landowner.

Pole Removal

If the Project is constructed along an existing transmission line, and Xcel Energy determines the existing facilities can be reasonably co-located, Xcel Energy may remove existing transmission line structures. For transmission line structures that do not have a footing, Xcel Energy will extract the pole from the ground if possible. In the event a pole cannot be extracted by pulling, Xcel Energy will excavate an area and an attempt will be made to extricate an excavated pole entirely. If an excavated pole cannot be removed in its entirety, the pole will either be cut off at the excavated depth (in the range of approximately five feet) or pushed over if the pole cannot be cut. If an existing transmission structure to be removed has a concrete footing, Xcel Energy will work with the Landowner to determine at what depth the footing must be removed so farming operations can continue on the property.

If Xcel Energy removes an existing pole, all support anchors for the structure will be removed. In these instances, Xcel Energy will work with the Landowner to identify any tile lines located near anchors prior to removal of the anchors. Additionally, if any damage to tile occurs as a result of pole or anchor removal, Xcel Energy will adhere to the "Agricultural Tile" section of this AIMP.

Agricultural Tile

Xcel Energy will contact an affected Landowner for his/her knowledge of tile locations prior to installation of the transmission line. Xcel Energy will attempt to identify tile if the Landowner does not know if tile is located at the proposed pole location. Tile that is damaged, cut, or removed as a result of Xcel Energy's location efforts will be promptly repaired.

If tile is damaged by Project construction, the tile will be repaired with materials of the same quality as that which was damaged. If tiles on or adjacent to the transmission line construction area are adversely affected by construction, Xcel Energy will take such actions as are necessary to restore the tile function, including the relocation, reconfiguration, and replacement of the existing tile. Xcel Energy will correct tile repairs, as needed, after completion of the transmission line construction, provided the repairs were made by Xcel Energy or their agents or designees.

The affected Landowner may elect to negotiate a fair settlement with Xcel Energy for the Landowner to undertake the responsibility for repair, relocation, reconfiguration, or replacement of damaged tile. In the event the Landowner chooses to undertake the responsibility for repair, relocation, reconfiguration, or replacement of the damaged tile, Xcel Energy will have no further liability for the identified damaged tile.

The following standards and policies apply to the tile repairs completed by Xcel Energy:

1. Tiles will be repaired with materials of the same or better quality as that which was damaged.
2. If water is flowing through a damaged tile, temporary repairs will be promptly installed and maintained until such time that permanent repairs can be made.
3. Xcel Energy will make efforts to complete permanent tile repairs within a reasonable timeframe after Final Clean-up, taking into account weather and soil conditions.
4. Following completion of the Final Clean-up and damage settlement, Xcel Energy will be responsible for correcting and repairing tile breaks, or other damages to tile systems that are discovered on the Right-of-Way to the extent that such breaks are the result of Project construction. These damages are usually discovered after the first significant rain event. Xcel Energy will provide the Landowner with contact information should tile damage issues be identified after Final Clean-up. The Companies will not be responsible for tile repairs performed by the Landowner.

Xcel Energy will be responsible for repairing areas as necessary to properly drain wet areas along the Right-of-Way caused by the construction of the Project.

Soil Compaction/Rutting

Xcel Energy will repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by electric line construction. If, by mutual agreement, the Landowner repairs such damage, Xcel Energy will reimburse the Landowner for the reasonable cost of labor and the use of equipment to repair damage incurred due to compaction, ruts, erosion, and/or washing of soil caused by electric line construction. Xcel Energy will make such payments within a reasonable period of time following completion of project construction and after receiving a statement substantiating the Landowner's repair costs.

If there is a dispute between the Landowner and Xcel Energy as to what areas need to be ripped or chiseled, the depth at which compacted areas should be ripped or chiseled, or the necessity for, or rates of, lime, fertilizer, and organic material application, Xcel Energy

will consult with the Environmental/Agricultural Monitor prior to making a final decision.

Excess Soil and Rocks

Excess soil and rock will be removed from the site unless otherwise requested by the Landowner. After Final Clean-up and restoration of Agricultural Lands, Xcel Energy will make good faith efforts to obtain written acknowledgement of completion of such activities from the Landowner.

Construction Debris

Xcel Energy will promptly remove construction-related debris and material which is not an integral part of the transmission line from the Landowner's property at the Companies' cost. Such material may include excess construction materials or litter generated by the construction crews. Xcel Energy, on behalf of the Companies, will pay for the reasonable cost of repairs to the Landowner's equipment if the equipment is damaged by materials or debris Xcel Energy left on the property during construction.

Procedures for Determination of Damages and Compensation

Xcel Energy will maintain a procedure for processing Landowner claims for construction-related damages, including but not limited to crop damages. The procedure is intended to standardize and minimize Landowner concerns regarding the recovery of damages, to provide a degree of certainty and predictability for Landowner and the Companies, and to foster good relationships among the Companies and Landowner over the long term. A copy of the procedure will be provided to Landowner during Easement acquisition negotiations.

Damage claim negotiations between Xcel Energy and any affected Landowner will be voluntary in nature. Xcel Energy will offer to compensate Landowners according to the terms of Xcel Energy's damage claim policy in effect at the time the Easement is executed and recorded. The compensation offered is only an offer to settle, and the offer shall not be introduced in any proceeding brought by the Landowner to establish the amount of damages Xcel Energy must pay on behalf of the Companies.

Soil Conservation Practices

Soil conservation practices such as terraces and grassed waterways which are damaged by the transmission line's construction will be restored to their pre-construction condition as near as possible. Xcel Energy will attempt to work with the Landowner to identify and document the pre-construction conditions of these features.

Irrigation

If the transmission line and/or temporary work areas intersect an operational (or soon to be operational) spray irrigation system, Xcel Energy will work with the Landowner to establish an acceptable amount of time the irrigation system may be out of service.

If, as a result of the transmission line construction activities, an irrigation system interruption results in crop damages either on the Right-of-Way or off the Right-of-Way, Landowners will be compensated for resulting crop loss.

If it is feasible and mutually acceptable to Xcel Energy and the Landowner, temporary measures will be implemented to allow an irrigation system to continue to operate across land on which the transmission line is also being constructed. Xcel Energy will not allow an irrigation system to continue operation across land on which the transmission line is also being constructed if Xcel Energy determines that such operation would be unsafe.

Access Routes/Temporary Roads

The location of access routes to be used for construction purposes will be discussed with the Landowner.

- A. The access routes will be designed so as to not impede proper drainage and will be built to mitigate soil erosion on or near the temporary roads.
- B. If grading is required to create a temporary road, these temporary roads may be left intact through mutual agreement of the Landowner and Xcel Energy unless otherwise restricted by Federal, State, or local regulations.
- C. If a temporary road is to be removed, the Agricultural Land upon which the temporary road is constructed will be returned to its previous use and restored to equivalent condition as existed prior to construction.

Organic Farms

The Companies recognize that Organic Agricultural Land is a unique feature of the landscape and will treat this land with a similar level of care as other sensitive environmental features. This section identifies mitigation measures that apply specifically to farms that are Organic Certified or farms that are in active transition to become Organic Certified, and is intended to address the unique management and certification requirements of these operations. This section supplements and is in addition to all other protections provided in this AIMP.

The provisions of this section will only apply to Organic Agricultural Land for which the Landowner has provided to Xcel Energy a true, correct and current version of the Organic System Plan within 60 days after the signing of the Easement or 60 days after the first contact by Xcel Energy after the Commission issues a Route Permit, whichever occurs first.

Organic System Plan

The Companies recognize the importance of the individualized Organic System Plan to the Organic Certification process. Xcel Energy will work with the Landowner, the Landowner's Certifying Agent, and/or a mutually acceptable third-party organic consultant to identify site-specific construction practices that will minimize the potential for Decertification as a result of construction activities. Possible practices may include, but are not limited to: equipment cleaning, planting a deep-rooted cover crop in lieu of mechanical decompaction, applications of composted manure or rock phosphate, preventing the introduction of disease vectors from tobacco use, restoration and replacement of beneficial bird and insect habitat, maintenance of organic buffer zones, use of organic seeds for any cover crop, or similar measures. The Companies recognize that Organic System Plans are proprietary in nature and will respect the need for confidentiality.

Prohibited Substances

Xcel Energy will avoid the application of Prohibited Substances onto Organic Agricultural Land. No herbicides, pesticides, fertilizers or seed will be applied to Organic Agricultural Land unless requested and approved by the Landowner. Likewise, Xcel Energy will avoid refueling, fuel or lubricant storage, or routine equipment maintenance on Organic Agricultural Land. Equipment will be checked prior to entry to make sure that fuel, hydraulic and lubrication systems are in good working order before working on Organic Agricultural Land. If Prohibited Substances are used on land adjacent to Organic Agricultural Land, these substances will be used in such a way as to prevent them from entering Organic Agricultural Land.

Temporary Road Impacts

Topsoil and Subsoil layers that are removed during construction on Organic Agricultural Land for temporary road impacts will be stored separately and replaced in the proper sequence after the transmission line is installed. Unless otherwise specified in the site-specific plan described above, Xcel Energy will not use this soil for other purposes, including creating access ramps at road crossings. No Topsoil or Subsoil (other than incidental amounts) may be removed from Organic Agricultural Land. Likewise, Organic Agricultural Land will not be used for storage of soil from non-Organic Agricultural Land.

Erosion Control

On Organic Agricultural Land, Xcel Energy will, to the extent feasible, implement erosion control methods consistent with the Landowner's Organic System Plan. On land adjacent to Organic Agricultural Land, Xcel Energy's erosion control procedures will be designed so that sediment from adjacent non-Organic Agricultural Land will not flow along the Right-of-Way and be deposited on Organic Agricultural Land. Treated lumber, non-organic hay bales, non-approved metal fence posts, etc. will not be used for erosion control on Organic Agricultural Land.

Weed Control

On Organic Agricultural Land, if Xcel Energy determines weed control is necessary during construction activities, Xcel Energy will, to the extent feasible, implement weed control methods consistent with the Landowner's Organic System Plan. Prohibited Substances will not be used for weed control within 50 feet of posted Organic Agricultural Land.

Monitoring

In addition to the responsibilities of the Environmental/Agricultural Monitor described in the AIMP, the following will apply:

- A. The Environmental/Agricultural Monitor will monitor construction and restoration activities on Organic Agricultural Land for compliance with the provisions of this section and will document any activities that may result in Decertification.
- B. Instances of non-compliance will be documented according to Independent Organic Inspectors Association protocol consistent with the Landowner's Organic System Plan, and will be made available to the MDA, the Landowner, the Landowner's Certifying Agent, and to the Companies.

Compensation for Construction Damages

The settlement of damages will be based on crop yield and/or crop quality determination and the need for additional restoration measures. Xcel Energy will first work with the Landowner of Organic Agricultural Land to determine crop yield. In the event Xcel Energy and the Landowner of Organic Agricultural Land cannot determine crop yield, at Xcel Energy's expense, a mutually agreed upon professional agronomist will make crop yield determinations, and the MDA Fruit and Vegetable Inspection Unit will make crop quality determinations. If the crop yield and/or crop quality determinations indicate the need for soil testing, the testing will be conducted by a commercial laboratory that is properly certified to conduct the necessary tests and is mutually agreeable to Xcel Energy and the Landowner. Field work for soil testing will be conducted by a professional soil scientist or professional engineer licensed by the State of Minnesota. Xcel Energy will be responsible for the cost of sampling, testing and additional restoration activities, if needed. Additional restoration activities will be completed according to the terms of its damage claim policy in effect at the time the Easement is executed and recorded.

Compensation for Damages Due to Decertification

Should any portion of Organic Agricultural Land be Decertified as a result of construction activities, Xcel Energy will pay damages for crops and/or livestock within the area impacted by the lost Certification equal to the full difference between the market value

of conventional crops and/or livestock and the market value of the organic crops and/or livestock lost for three years or the period of time necessary for the Landowner or Tenant to regain Certification, whichever comes first. The market value of the crop will be determined as set forth in the damage claim policy. At the request of Xcel Energy, the Landowner shall provide verification of its loss of Organic Certification through the accredited certifying agent prior to any compensation for organic crop loss being paid.

Definitions

Agricultural Land	Land that is actively managed for cropland, hayland, or pasture, and land in government set-aside programs.
Environmental/Agricultural Monitor	Monitor retained by the Companies responsible for overall project compliance with permit conditions and commitments made in this document. The Environmental/Agricultural Monitor shall also report directly to the Minnesota Department of Agriculture (“MDA”) and will be responsible for auditing the Companies’ compliance with provisions of this AIMP. The monitor will have demonstrated experience with pipeline or electric transmission line construction on Agricultural Land.
Certifying Agent	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Cropland	Land actively managed for growing row crops, small grains, or hay.
Decertified or Decertification	Loss of Organic Certification.
Easement	The agreement(s) and/or interest in privately owned Agricultural Land held by the Companies by virtue of which it has the right to construct, operate, and maintain the transmission line together with such other rights and obligations as may be set forth in such agreement.
Final Clean-up	Transmission line activity that occurs after the power line has been constructed. Final Clean-up activities may include: removal of construction debris, de-compaction of soil as required, removal of temporary erosion control structures, final grading, and restoration of fences and required reseeding. Once Final Clean-up is finished, Landowner will be contacted to settle all damage issues and will be provided a form to sign acknowledging final construction settlement.

The Companies	Northern States Power Company, doing business as Xcel Energy and ITC Midwest LLC, a Michigan limited liability company. May also include agents and contractors of Northern States Power Company, doing business as Xcel Energy and ITC Midwest, where appropriate.
Landowner	Person(s), or their representatives, holding legal title to Agricultural Land on the transmission line route from whom the Companies is seeking, or has obtained, a temporary or permanent Easement. "Landowner" includes Tenant, if any.
Non-Agricultural Land	Any land that is not "Agricultural Land" as defined above.
Organic Agricultural Land	Farms or portions thereof described in 7 CFR Parts 205.100, 205.202, and 205.101.
Organic Buffer Zone	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Organic Certification or Organic Certified	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.100 and 7 CFR Part 205.101.
Organic System Plan	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.2.
Prohibited Substance	As defined by the National Organic Program Standards, Federal Regulations 7 CFR Part 205.600 through 7 CFR 205.605 using the criteria provided in 7 USC 6517 and 7 USC 6518.
Right-of-Way	The Land included in permanent and temporary Easements which the Companies acquire for the purpose of constructing, operating and maintaining the transmission line.
Subsoil	Soil that is not Topsoil, and located immediately below Topsoil.

Tenant	Any Person(s) lawfully renting or sharing land for agricultural production which makes up the “Right-of-Way” as defined in this AIMP.
Tile	Artificial subsurface drainage system.
Topsoil	The uppermost horizon (layer) of the soil, typically with the darkest color and highest content of organic matter.

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Appendix E

Property Value Supplement

Attempts to correlate proximity to transmission lines with impacts to property values are complicated by the interaction of several relevant factors, including geographic region, land use, variability in perceptions over time, and limited sales data for similar properties before and after construction of transmission lines. Researchers have generally used survey-based techniques and statistical analyses to make inferences and draw conclusions about the relationship between transmissions lines and property values. In general, surveys provide useful insights for estimating price effects based on public opinion, yielding what researchers refer to as “stated preferences.” Statistical analyses, on the other hand, reflect the actual behavior of property buyers and sellers in terms of recorded sales prices, providing what researchers refer to as the “revealed preferences.” In other words, there is often incongruity between what people think and how they actually behave. Measuring both perceptions and actual behaviors helps researchers understand the relationship between transmission lines and property values.

A recent literature review (Jackson and Pitts 2010, reference E1) examined 17 studies on the relationship between transmission lines and property values to compare their results and to develop some general conclusions. The 17 studies, spanning the time period between 1956 and 2009, were compiled and reviewed by Real Property Analytics, Inc., a private firm specializing in the valuation of property potentially affected by external environmental factors. The Real Property Analytics review was published in the *Journal of Real Estate Literature*, which is a publication of the American Real Estate Society. The studies evaluated impacts from transmission lines ranging from 69 kilovolts (kV) to 345 kV. They were placed into one of three categories designated by the authors:

- Survey-based studies;
- Statistical sales-based analyses using multivariate analysis to isolate the impact of transmission lines by holding other variables statistically constant; and
- Sales-based analyses not using multivariate analysis, but utilizing factors such as sale/resale analysis, price per square foot comparisons, case studies and “paired sales” analysis, where the values of two homes that are similar in all respects except for proximity to transmission lines are compared.

Upon completion of their review of the studies, Jackson and Pitts (2010, reference E1) concluded the following:

“The studies reviewed...generally pointed to small or no effects on sales prices due to the presence of electric transmission lines. Some studies found an effect but this effect generally dissipated with time and distance. The effects that were found ranged from approximately 2% to 9%. Most studies found no effect and in some cases a premium was observed.”

Jackson and Pitts discussed the utility of both survey-based and statistically-based methods, quoting one of the research papers to note that statistical analyses “reflect what buyers and sellers actually do, opposed to what potential buyers say they might do, under specified hypothetical circumstances” Selected findings from Jackson and Pitts’s literature review are provided below, along with the year and type of study:

Survey-based studies

- Kinnard, 1967 – Questionnaires were sent to property owners intersected by or abutting transmission line right-of-way (ROW) in 17 Connecticut subdivisions. Over 85 percent indicated they would purchase again in the same location. Kinnard concluded that property value is not significantly affected by proximity to transmission lines.
- Morgan et al., 1985 – A questionnaire asked participants to rank the risk from transmission lines, electric blankets and 14 other common hazards. Electric blankets and transmission lines were ranked as presenting the least risk. Participants were then provided with information on electric and magnetic fields (EMF) and associated potential health effects. Subsequent questionnaire responses indicated a change in perception and an increased concern about the risk of EMF.
- Solum, 1985 – Presented a questionnaire to 180 agricultural, recreational, or residential property owners in northwest Wisconsin whose land was encumbered by transmission lines. All three types had some level of concern over the proximity of the lines, but for varying reasons. Further interviews indicated that all but one of the properties sold at a market price comparable to non-encumbered properties and that none of the buyers had reduced their purchase offers due to the presence of the transmission line.
- Delaney and Timmons, 1992 – Survey results from 219 real estate appraisers found that 84 percent believed that transmission line proximity results in an average ten percent lower market value. Ten percent of respondents found no effect and six percent thought transmission lines increased property value due to larger lots for similar price.
- Kung and Seagle, 1992 – Sent a questionnaire to homeowners in Memphis and Shelby Counties, Tennessee. Half of the respondents considered the transmission line an eyesore; however, 72 percent of those who thought the lines were an eyesore also said the lines had no effect on the purchase price. Prices of homes adjacent to the transmission line are similar to prices of other homes in the same neighborhood.
- Priestly and Evans, 1996 – Conducted a survey of 445 homeowners living near transmission lines in the San Francisco area. Eighty-seven percent of the 267 respondents felt the transmission line was a negative element in their neighborhood.

Statistical Sales Price Analyses

- Brown, 1976 – Conducted regression analysis on sales of farm land in Saskatchewan, Canada, between 1965 and 1970 and found that the relationship of land value to the number of power line structures was not statistically significant and that the lines did not negatively affect property value. Brown also found that the structures can be an impediment to farming operations.
- Colwell and Foley, 1979 – Examined 200 property sales over a ten-year period in Decatur, Illinois and found that sales price increases as distance from a transmission line increases. Property values were approximately six percent lower within 50 to 200 feet of the transmission line, but there was no difference in property value beyond 200 feet.
- Colwell, 1990 – Followed up the study above and confirmed that the selling price of residential property increases as distance from the transmission line increases. The rate of increase slows with distance and eventually disappears.

- Rigdon, 1991 – Evaluated 46 properties sold in Marquette County, Michigan over a five-year period and found no statistically significant relationship between sales price and proximity to a transmission line easement.
- Hamilton and Schwann, 1995 – Reviewed previous literature and found that transmission lines can reduce adjacent property values, but that the reduction is generally less than five percent of property value and that the reduction diminishes at 600 feet.
- Des Rosiers, 1998 – Reviewed property values of 507 homes in the Montreal area and found an average drop in property value of 9.6 percent for homes immediately adjacent to the line. He also found an average increase of up to 9.2 percent in value for homes one to two lots away from the transmission line and no effect beyond 500 feet.
- Wolverton and Bottemiller, 2003 and Cowger, Bottemiller and Cahill, 1996 – Two studies, both conducted in Portland, Vancouver, and Seattle, the 2003 work repeating the 1996 study with more rigorous analytical methods. Both applied statistical methods to paired-sales analysis and found no price effect on residential property from proximity to transmission lines. The data also show no difference in appreciation rates between homes near a transmission line and homes further away.
- Chalmers and Voorvaart, 2009 – Studied residential properties sold in Connecticut and Massachusetts between 1999 and 2007 and found proximity to transmission lines to have an insignificant effect on sales prices.

Sales-based analyses

- Carll, 1956 – Compared property values and interviewed owners, buyers and brokers along a transmission line in Los Angeles and found that residences adjoining the ROW had not sold at a discount and that lenders did not adjust loan amounts for lots adjacent to the ROW.
- Bigras, 1964 – Reviewed over 1,900 deeds of sale and mortgages in Quebec and found that prices for vacant land adjacent to transmission lines were generally higher than the average price of all transactions. Land adjacent to transmission lines was sold faster and was developed to a higher degree than land away from the lines.

Jackson and Pitts (2010) concluded from these studies that proximity to transmission lines results in little or no effect on property value. In studies where transmission lines were found to have impacts to property values, the decrease in values typically ranged from approximately two percent to ten percent. In some instances, increases in property value were found. The following additional studies and reviews generally reach a similar conclusion.

Between 1978 and 1982, Jensen and Weber and the Jensen Management Company conducted three studies in west-central Minnesota. The studies in 1978 and 1982 are of particular interest since they consider effects to agricultural land. The 1978 study found that the landowners cited an inconvenience to the presence of the line, but had not paid less for their land (Weber and Jensen 1978, reference E2). The 1982 study, however, found there was a broad range of effect from no effect to a 20 percent reduction, which depended on the amount of disruption to farm operations (Jensen and Weber 1982, reference E3).

In the final EIS on the Arrowhead-Weston Electric Transmission Line Project, the Wisconsin Public Service Commission (PSC) addressed the issue of property value changes associated with high voltage transmission lines. This document summarized the findings of approximately 30 papers, articles, and court cases covering the period of 1987 through 1999. The Arrowhead-Weston EIS provides six general observations (reference E4):

- The potential reduction in sale price for single family homes may range from zero to 14 percent.
- Adverse effects on the sale price of smaller properties could be greater than effects on the sale price of larger properties.
- Other amenities, such as proximity to school or jobs, lot size, square footage of a house and neighborhood characteristics, tend to have a much greater effect on sale price than the presence of a power line.
- The adverse effects appear to diminish over time.
- Effects on sale price are most often observed for properties crossed by or immediately adjacent to a power line, but effects have also been observed for properties farther away from the line.
- The value of agricultural property is likely to decrease if the power line poles are placed in an area that inhibits farm operations.

The Arrowhead-Weston Electric Transmission Line Project environmental impact statement (EIS) reported that in Midwest states such as Minnesota, Wisconsin and the Upper Peninsula of Michigan, the average decrease appears to be between four and seven percent. The EIS noted that it is very difficult to make predictions about how a specific transmission line would affect the value of specific properties.

An additional potential adverse effect of transmission lines on adjacent properties is on the ability of homeowners and developers to obtain Federal Housing Administration (FHA) and/or Housing and Urban Development (HUD) loans. Section 2.2(J) of the current HUD guidebook 4150.2 addresses this issue in the following FAQ:

FAQ: Is a property eligible for FHA if there are overhead or high voltage power lines nearby?

The appraiser must indicate whether the dwelling or related property improvements is located within the easement serving a high-voltage transmission line, radio/TV transmission tower, cell phone tower, microwave relay dish or tower, or satellite dish (radio, TV cable, etc).

1) If the dwelling or related property improvement is located within such an easement, the lender must obtain a letter from the owner or operator of the tower indicating that the dwelling and its related property improvements are not located within the tower's (engineered) fall distance in order to waive this requirement.

2) If the dwelling and related property improvements are located outside the easement, the property is considered eligible and no further action is necessary. The appraiser, however, is instructed to note and comment on the effect on marketability resulting from the proximity to such site hazards and nuisances.

In general and for safe operation of the line, a residence cannot be located within a transmission line ROW; thus, all residences near the project would fall into category 2 (a dwelling located "outside the easement"). For this category, the HUD appraiser is directed to comment on any effects on marketability resulting from the transmission line. These comments could affect loan values if an appraiser believes the residence is nevertheless located so near the transmission line that the line could be a hazard or nuisance.

References

- E1. Jackson and Pitts, 2010. The Effects of Transmission Lines on Property Values: A Literature Review. *Journal of Real Estate Literature*. Volume 18, No 2.
- E2. Weber, William V. and Glenn A. Jensen. 1978. A Study of High Voltage Power Line Easements and their Effect on Farm Land Values in West Central Minnesota. Luverne, Minnesota: Jensen Management Service.
- E3. Jensen, Glenn A. and William V. Weber. 1982. High Voltage Transmission Lines and their Effect on Farm Land Value in West Central Minnesota. Luverne, Minnesota: Jensen Management Service, Inc.
- E4. Final Environmental Impact Statement, Arrowhead –Weston Electric Transmission Line Project, Volume I, Public Service Commission of Wisconsin Docket 05-CE-113, October 2000, pg 212-215.

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Appendix F

Electric and Magnetic Fields Supplement

There is concern about the potential for adverse health effects from exposure to electric and magnetic fields (EMF) as the result of residing near high voltage transmission lines (HVTLS). Extremely low-frequency (ELF)-EMF that is emitted from HVTLS does not have the energy to ionize molecules or to heat them; however, they are fields of energy and thus have the potential to produce effects.

In the 1970s, epidemiological studies indicated a possible association between childhood leukemia and EMF levels. Since then, various types of research, including animal studies, epidemiological studies, clinical studies and cellular studies, have been conducted to examine the potential health effects of EMF. Scientific panels and commissions have reviewed and studied this research data. These studies have been conducted by, among others, the National Institute of Environmental Health Sciences (NIEHS), the World Health Organization (WHO), the International Agency for Research on Cancer (IARC), the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) and the Minnesota State Interagency Working Group (MSIWG). In general, these studies concur that:

- Based on epidemiological studies, there is a weak association between childhood leukemia and EMF exposure. There is however no consistent association between EMF exposure and other diseases in children or adults.
- Laboratory, animal, and cellular studies fail to show a cause and effect relationship between disease and EMF exposure at common EMF levels. A biological mechanism for how EMFs might cause disease has not been established.

Because a cause and effect relationship cannot be established, yet a weak association between childhood leukemia and EMF exposure has been shown: 1) the potential health effects of EMF are uncertain; 2) no methodology for estimating health effects based on EMF exposure exists; 3) further study of the potential health effects of EMF is needed; and 4) a precautionary approach, including regulations and guidelines, is needed in designing and using all electrical devices.

Researchers continue to study potential health effects related to ELF-EMF and potential causal mechanisms. The following sections provide brief summaries from scientific panels and commissions that have examined the potential health impacts of ELF-EMF.

In 1992, the U.S. Congress authorized the Electric and Magnetic Fields Research and Public Information Dissemination Program (EMF-RAPID program). Congress instructed NIEHS and the U.S. Department of Energy to direct and manage a program of research and analysis aimed at providing scientific evidence to clarify the potential for health risk from exposure to ELF-EMF. The program provided the following conclusions to Congress (NIEHS 1999, reference F1):

- "The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak.
- Epidemiological studies have serious limitations in their ability to demonstrate a cause and effect relationship whereas laboratory studies, by design, can clearly show that cause and effect are possible. Virtually all of the laboratory evidence in animals and humans and most of the mechanistic work done in cells fail to support a causal relationship between exposure to ELF-EMF at environmental levels and changes in biological function or disease status. The lack of consistent positive findings in animal or mechanistic studies weakens the belief that this association (the epidemiological association between ELF-EMF and childhood leukemia) is actually due to ELF-EMFs but it cannot completely

discount the epidemiological findings.

- The NIEHS concludes that ELF-EMF exposure cannot be recognized as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard. In our opinion, this finding is insufficient to warrant aggressive regulatory concern. However, because virtually everyone in the United States uses electricity and therefore is routinely exposed to ELF-EMF, passive regulatory action is warranted such as a continued emphasis on education both the public and regulated community on means aimed at reducing exposures. The NIEHS does not believe that other cancers or non-cancer outcomes provide sufficient evidence of a risk to currently warrant concern."

In 2002, the EMF-RAPID program published a detailed question and answer pamphlet summarizing research on ELF-EMF and potential health effects. The pamphlet is available at: http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

World Health Organization

In 1996, the WHO established the International EMF Project to study the potential health impacts of EMF. The project develops and disseminates information on EMF and public health. In 2007, the WHO issued an environmental health monograph on ELF-EMF (WHO 2007, reference F2). The monograph concluded:

- "Scientific evidence suggesting that everyday, chronic low-intensity (above 0.3 – 0.4 μ T) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. Uncertainties in the hazard assessment include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal, but sufficiently strong to remain a concern.
- A number of other diseases have been investigated for the possible association with ELF magnetic field exposures. These include cancers in children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.
- The use of precautionary approaches is warranted. However, electric power brings obvious health, social and economic benefits and precautionary approaches should not compromise these benefits. Furthermore, given both weakness of the evidence for a link between exposure to ELF magnetic fields and childhood leukemia and the limited impacted on public health if there is a link, the benefits of exposure reduction on health are unclear. Thus, the costs of precautionary measures should be very low. The costs of implementing exposure reductions would vary from one country to another, making it very difficult to provide general recommendation for balancing the costs against the potential risk from ELF fields."

International Agency for Research on Cancer

Since 1969, the IARC has been evaluating the carcinogenic risks of chemicals and other agents, such as viruses and radiation. In 2001, the IARC convened a working group of scientists to evaluate possible carcinogenic risks to humans from exposure to EMF (IARC 2002, reference F3). These scientists concluded that ELF magnetic fields are possibly carcinogenic to humans (a "Group 2B carcinogen"). Group 2B carcinogens are agents for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence for carcinogenicity in experimental animals. The working group concluded:

- "Since the first report suggesting an association between residential ELF electric and magnetic fields and childhood leukemia was published in 1979, dozens of increasingly sophisticated studies have examined this association. In addition, there have been numerous comprehensive review, meta-analyses and two recent pooled analyses. In one pooled analysis...no excess risk was seen for exposure to ELF magnetic fields below 0.4 μ T and a twofold excess risk was seen for exposure above 0.4 μ T. [In the other study] a relative risk of 1.7 for exposure above 0.3 μ T was reported.
- No consistent relationship has been seen in studies of childhood brain tumors or cancers at other sites and residential ELF electric and magnetic fields.
- While a number of studies are available, reliable data on adult cancer and residential exposure to ELF electric and magnetic fields, including the use of appliances, are sparse and methodologically limited.... Although there have been considerable number of reports, a consistent association between residential exposure and adult leukemia and brain cancer has not been established."

Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR)

The SCENIHR serves as an advisory committee to the European Commission. At the request of the Commission, the SCENIHR reviewed possible adverse health impacts due to EMF. In 2007, the committee concluded (SCENIHR 2007, reference F4):

- "The previous conclusion (by a prior advisory committee, the Scientific Committee on Toxicity, Ecotoxicity and the Environment, CSTE) that ELF magnetic fields are possibly carcinogenic, chiefly based on occurrence of childhood leukemia, is still valid. For breast cancer and cardiovascular disease, recent research has indicated that an association is unlikely. For neurodegenerative diseases and brain tumors, the link to ELF fields remains uncertain."
- In vitro studies have documented that that low intensity ELF can inhibit the anti-proliferative effect of tamoxifen on a specific subclone of human MCF-7 breast cancer cells (Blackman et al. 2001, reference F5; Ishido et al. 2001, reference F6; Girgert et al. 2005, reference F7). There is a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

In 2009, the committee updated its prior opinion after reviewing new studies of ELF-EMF (SCENIHR 2009, reference F8) and concluded:

- “The new information available is not sufficient to changes the conclusions of the 2007 opinion. The few new epidemiological and animal studies that have addressed ELF exposure and cancer do not change the previous assessment that ELF magnetic fields are a possible carcinogen and might contribute to an increase in childhood leukemia. At present, in vitro studies did not provide a mechanistic explanation of this epidemiological finding.
- New epidemiological studies indicate a possible increase in Alzheimer’s disease arising from exposure to ELF. Further epidemiological and laboratory investigations of this observation are needed.”
- There remains a need for independent replication of certain studies suggesting genotoxic effects and for better understanding of combined effects of ELF magnetic fields with other agents, their effects on free radical homeostasis, as well as of the possible implications of ELF field inhibition of tamoxifen effects.

Minnesota State Interagency Working Group (MSIWG)

In 2002, the MSIWG on EMF issues was formed to examine the potential health impacts of EMF and to provide science-based information to policy makers in Minnesota. Working group members included representatives from the Department of Commerce, Department of Health, Pollution Control Agency, Public Utilities Commission, and Environmental Quality Board. The working group issued a white paper entitled “A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options” (MSIWG on EMF Issues 2002, reference F9). The white paper concluded:

- “Some epidemiological results do show a weak but consistent association between childhood leukemia and increasing exposure to EMF... However, epidemiological studies alone are considered insufficient for concluding that a cause and effect relationship exists and the association must be supported by data from laboratory studies. Existing laboratory studies have not substantiated this relationship... nor have scientists been able to understand the biological mechanism of how EMF could cause adverse effects. In addition, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMF.
- The Minnesota Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk from EMF cannot be dismissed. Construction of new generation and transmission facilities to meet increasing electrical needs in the state is likely to increase exposure to EMF and public concern regarding potential adverse health effects.
- Based on its review, the Work Group believes the most appropriate public health policy is to take a prudent avoidance approach to regulating EMF. Based upon this approach, policy recommendations of the Work Group include:
- Apply low-cost EMF mitigation options in electric infrastructure construction projects;

- Encourage conservation;
- Encourage distributed generation;
- Continue to monitor EMF research;
- Encourage utilities to work with customers on household EMF issues; and
- Provide public education on EMF issues.”

References

- F1. National Institute of Environmental Health Sciences, 1999. NIEHS Report on Health Effects from Exposure to Power-line Frequency Electric and Magnetic Fields. NIH Publication No. 99-4493
- F2. World Health Organization, 2007. Environmental Health Criteria 238 (2007): Extremely Low Frequency (ELF) Fields. ISBN 978-92-4-157238-5
- F3. International Agency for Research on Cancer, 2002. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Volume 80. Non-Ionizing Radiation, Part 1: Static and Extremely Low-Frequency (ELF) Electric and Magnetic Fields. Summary of Data Reported and Evaluation
- F4. Scientific Committee on Emerging and Newly Identified Health Risks, 2007. Possible Effects of Electromagnetic Fields (EMF) on Human Health. Accessed November 2018 at: http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/docs/scenihhr_o_007.pdf
- F5. Blackman, C. F., Benane, S. G., & House, D. E. (2001). The Influence of 1.2 μ T, 60 Hz Magnetic Fields on Melatonin- and Tamoxifen-Induced Inhibition of MCF-7 Cell Growth. *Bioelectromagnetics* (22), pp. 122-128.
- F6. Ishido, M., Nitta, H., & Kabuto, M. (2001). Magnetic fields (MF) of 50 Hz at 1.2 μ T as well as 100 μ T cause uncoupling of inhibitory pathways of adenylyl cyclase mediated by melatonin 1a receptor in MF-sensitive MCF-7 cells. *Carcinogenesis*, 22(7), pp. 1043-1048.
- F7. Girgert, R., Schimming, H., Korner, W., Grundker, C., & Hanf, V. (2005). Induction of tamoxifen resistance in breast cancer cells by ELF electromagnetic fields. *Biochemical and Biophysical Research Communications* (336), pp. 1144–1149.
- F8. Scientific Committee on Emerging and Newly Identified Health Risks, 2009. Health Effects of Exposure to EMF. Accessed November 2018 at: http://ec.europa.eu/health/ph_risk/committees/04_scenihhr/docs/scenihhr_o_022.pdf
- F9. The Minnesota State Interagency Working Group on EMF Issues, 2002. A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options. Accessed November 2018 at: <https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=showPoup&documentId=%7B474587DD-E5C5-4A6E-95BC-7BC805CE4975%7D&documentTitle=20101-45731-07>

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Appendix G

Archaeological and Historic Resources Data

Archaeological Resource Data

Site Number	County	Township	Range	Section	NRHP Status
21BE0007	Blue Earth	108	27	22	Not Evaluated
21BE0017	Blue Earth	105	27	19, 30	Not Evaluated
21BE0020	Blue Earth	108	27	23	Not Evaluated
21BE0022	Blue Earth	108	26	12	Not Evaluated
21BE0024	Blue Earth	108	27	21	Not Evaluated
21BE0025	Blue Earth	108	27	16	Not Evaluated
21BE0028	Blue Earth	107	25	8	Not Evaluated
21BE0033	Blue Earth	108	27	14	Not Evaluated
21BE0041	Blue Earth	105	27	31	Not Evaluated
21BE0042	Blue Earth	105	27	30	Not Evaluated
21BE0043	Blue Earth	105	27	18	Not Evaluated
21BE0047	Blue Earth	106	27	34	Not Evaluated
21BE0060	Blue Earth	108	27	29	Not Evaluated
21BE0061	Blue Earth	108	27	29	Not Evaluated
21BE0062	Blue Earth	105	29	1	Not Evaluated
21BE0063	Blue Earth	108	27	14	Not Evaluated
21BE0099	Blue Earth	108	27	21	Not Evaluated
21BE0100	Blue Earth	108	27	21, 22	Not Evaluated
21BE0101	Blue Earth	108	27	21	Not Evaluated
21BE0102	Blue Earth	108	27	22	Not Evaluated
21BE0103	Blue Earth	108	27	22	Not Evaluated
21BE0104	Blue Earth	108	27	22	Not Evaluated
21BE0118	Blue Earth	108	26	35	Considered Eligible
21BE0119	Blue Earth	108	26	36	Not Evaluated
21BE0120	Blue Earth	107	26	1	Considered Eligible
21BE0121	Blue Earth	108	27	30	Not Evaluated
21BE0125	Blue Earth	108	26	1, 2	Not Evaluated
21BE0126	Blue Earth	108	26	2	Not Evaluated
21BE0130	Blue Earth	108	27	21	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
21BE0131	Blue Earth	108	27	21	Not Evaluated
21BE0132	Blue Earth	108	27	21	Not Evaluated
21BE0133	Blue Earth	108	27	21	Not Evaluated
21BE0134	Blue Earth	108	27	21	Not Evaluated
21BE0142	Blue Earth	108	27	20	Not Evaluated
21BE0153	Blue Earth	108	27	14	Not Evaluated
21BE0155	Blue Earth	109	26	28	Not Evaluated
21BE0157	Blue Earth	108	27	23	Not Evaluated
21BE0158	Blue Earth	108	27	32	Not Evaluated
21BE0159	Blue Earth	108	27	32	Not Evaluated
21BE0165	Blue Earth	105	28	6	Not Evaluated
21BE0166	Blue Earth	105	28	6	Not Evaluated
21BE0167	Blue Earth	105	28	7	Not Evaluated
21BE0168	Blue Earth	105	29	12	Not Evaluated
21BE0169	Blue Earth	105	29	14	Not Evaluated
21BE0176	Blue Earth	105	28	6	Not Evaluated
21BE0181	Blue Earth	105	28	7	Not Evaluated
21BE0183	Blue Earth	105	28	6	Not Evaluated
21BE0184	Blue Earth	105	28	6	Not Evaluated
21BE0192	Blue Earth	108	27	29	Not Evaluated
21BE0193	Blue Earth	108	27	20	Not Evaluated
21BE0194	Blue Earth	107	27	32	Not Evaluated
21BE0195	Blue Earth	107	27	32	Not Evaluated
21BE0196	Blue Earth	108	27	29	Not Evaluated
21BE0197	Blue Earth	108	27	30	Not Evaluated
21BE0199	Blue Earth	107	27	5	Not Evaluated
21BE0203	Blue Earth	106	29	36	Not Evaluated
21BE0212	Blue Earth	105	29	13	Not Evaluated
21BE0213	Blue Earth	105	29	13	Not Evaluated
21BE0214	Blue Earth	105	29	13	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
21BE0220	Blue Earth	105	28	7	Not Evaluated
21BE0221	Blue Earth	105	28	6	Not Evaluated
21BE0222	Blue Earth	105	28	6	Not Evaluated
21BE0225	Blue Earth	105	29	24	Not Evaluated
21BE0226	Blue Earth	105	29	23	Not Evaluated
21BE0228	Blue Earth	105	29	2	Not Evaluated
21BE0242	Blue Earth	105	28	6	Not Evaluated
21BE0249	Blue Earth	105	28	6	Not Evaluated
21BE0252	Blue Earth	109	26	34	Not Evaluated
21BE0253	Blue Earth	108	27	20	Not Evaluated
21BE0254	Blue Earth	108	27	20	Not Evaluated
21BE0256	Blue Earth	107	25	8	Not Evaluated
21BE0267	Blue Earth	109	26	34	Not Evaluated
21BE0271	Blue Earth	108	27	16	Not Evaluated
21BE0276	Blue Earth	108	28	4	Not Evaluated
21BE0279	Blue Earth	106	27	16	Not Evaluated
21BE0287	Blue Earth	109	28	33	Not Evaluated
21BE0288	Blue Earth	109	28	32	Not Evaluated
21BE0289	Blue Earth	109	28	32	Not Evaluated
21BE0294	Blue Earth	106	25	32	Not Evaluated
21BE0297	Blue Earth	106	27	22	Not Evaluated
21BE0300	Blue Earth	108	27	14	Not Evaluated
21BE0301	Blue Earth	108	26	11	Not Evaluated
21BE0302	Blue Earth	108	26	14	Not Evaluated
21BE0303	Blue Earth	108	27	16, 17	Not Evaluated
21BE0309	Blue Earth	108	27	23	Not Evaluated
21BEab	Blue Earth	106	27	28	Not Evaluated
21BEah	Blue Earth	106	27	10	Not Evaluated
21BEai	Blue Earth	107	27	8	Not Evaluated
21BEav	Blue Earth	108	28	3, 4	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
21BEaw	Blue Earth	108	27	14	Not Evaluated
21BEay	Blue Earth	106	25	9	Not Evaluated
21BEaz	Blue Earth	108	27	20	Not Evaluated
21BEba	Blue Earth	106	28	30	Not Evaluated
21BEbe	Blue Earth	105	29	25	Not Evaluated
21EBbg	Blue Earth	107	27	8	Not Evaluated
21EBbi	Blue Earth	105	25	20	Not Evaluated
21EBbj	Blue Earth	108	27	22	Not Evaluated
21EBbk	Blue Earth	108	26	25	Not Evaluated
21BEbo	Blue Earth	108	27	14	Not Evaluated
21EBbp	Blue Earth	109	26	33	Not Evaluated
21EBbt	Blue Earth	108	28	5	Not Evaluated
21BEm	Blue Earth	108	28	4	Not Evaluated
21BEq	Blue Earth	108	27	21	Not Evaluated
21BEr	Blue Earth	108	27	14	Not Evaluated
21BEt	Blue Earth	106	27	21	Not Evaluated
21BEy	Blue Earth	108	26	22	Not Evaluated
21BEz	Blue Earth	107	27	35	Not Evaluated
21FA0004	Fairbault	104	27	21, 28, 29	Not Evaluated
21FA0040	Fairbault	103	28	23	Not Evaluated
21FA0041	Fairbault	103	28	23	Not Evaluated
21FA0042	Fairbault	103	28	23	Not Evaluated
21FA0046	Fairbault	103	28	23	Not Evaluated
21FA0049	Fairbault	103	28	23	Not Evaluated
21FA0057	Fairbault	104	26	3	Not Evaluated
21FA0058	Fairbault	104	27	3	Not Evaluated
21FA0060	Fairbault	103	28	23	Not Evaluated
21FA0061	Fairbault	103	28	23	Not Evaluated
21FA0062	Fairbault	103	28	23	Not Evaluated
21FA0063	Fairbault	103	28	23	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
21FA0064	Fairbault	103	28	15	Listed
21FA0065	Fairbault	103	28	15	Listed
21FA0066	Fairbault	103	28	16	Not Evaluated
21FA0067	Fairbault	103	28	19	Not Evaluated
21FA0095	Fairbault	103	28	23	Not Evaluated
21FA0096	Fairbault	103	28	23	Not Evaluated
21FA0106	Fairbault	103	28	23	Not Eligible
21FA0107	Fairbault	103	28	11	Not Eligible
21FA0108	Fairbault	103	28	13	Not Eligible
21FA0109	Fairbault	103	28	13	Not Eligible
21FA0110	Fairbault	103	28	24	Not Eligible
21FA0113	Fairbault	103	28	15	Not Evaluated
21FA0114	Fairbault	103	28	10	Not Evaluated
21FA0118	Fairbault	104	26	12	Not Evaluated
21FA0124	Fairbault	104	27	31	Not Evaluated
21FA0144	Fairbault	103	28	14	Not Evaluated
21FA0145	Fairbault	103	28	11	Not Evaluated
21FA0146	Fairbault	103	28	14	Not Evaluated
21FA0147	Fairbault	103	28	14	Not Evaluated
21FA0148	Fairbault	103	28	9, 16	Not Evaluated
21FA0149	Fairbault	103	28	9, 16	Not Evaluated
21FA0151	Fairbault	103	28	15	Not Evaluated
21FA0153	Fairbault	103	28	15	Not Evaluated
21FA0154	Fairbault	103	28	23	Not Evaluated
21FA0155	Fairbault	103	28	23	Not Evaluated
21FAaa	Fairbault	104	27	28	Not Evaluated
21FAad	Fairbault	104	26	10	Not Evaluated
21FAb	Fairbault	104	27	8	Not Evaluated
21FAf	Fairbault	104	27	15	Not Evaluated
21FAt	Fairbault	103	28	24	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
21NL0010	Nicollet	108	28	1	Not Evaluated
21NL0028	Nicollet	109	27	36	Not Evaluated
21NL0047	Nicollet	108	27	9	Considered Eligible
21NL0065	Nicollet	108	28	2, 35	Not Evaluated
21NL0121	Nicollet	108	27	8	Not Evaluated
21NL0140	Nicollet	108	27	9	Not Evaluated
21NL0147	Nicollet	109	27	25	Not Evaluated
21NLao	Nicollet	108	27	5, 8	Not Evaluated
21NLar	Nicollet	109	28	34	Not Evaluated
21NLb	Nicollet	108	27	8	Not Evaluated
21NLg	Nicollet	109	28	33	Not Evaluated
21NLm	Nicollet	109	28	33	Not Evaluated

Histroic Resource Data

Site Number	County	Township	Range	Section	NRHP Status
BE-CER-004	Blue Earth	106	29	10	Not Evaluated
BE-CER-006	Blue Earth	105	25	8	Not Evaluated
BE-DAN-004	Blue Earth	106	27	10	Not Evaluated
BE-GTC-001	Blue Earth	106	27	10	Not Evaluated
BE-GTC-002	Blue Earth	106	27	10	Not Evaluated
BE-GTC-003	Blue Earth	106	27	9	Not Evaluated
BE-GTC-004	Blue Earth	106	27	9	Not Evaluated
BE-GTC-005	Blue Earth	106	27	10	Not Evaluated
BE-GTC-006	Blue Earth	106	27	10	Not Evaluated
BE-GTC-007	Blue Earth	106	27	9	Not Evaluated
BE-GTC-008	Blue Earth	106	27	10	Not Evaluated
BE-GTC-009	Blue Earth	106	27	10	Not Evaluated
BE-GTC-010	Blue Earth	106	27	10	Not Evaluated
BE-GTC-011	Blue Earth	106	27	10	Not Evaluated
BE-GTC-012	Blue Earth	106	27	9	Not Evaluated
BE-GTC-013	Blue Earth	106	27	10	Not Evaluated
BE-GTC-014	Blue Earth	106	27	9	Not Evaluated
BE-GTC-015	Blue Earth	106	27	9	Not Evaluated
BE-GTC-016	Blue Earth	106	27	10	Not Evaluated
BE-GTC-017	Blue Earth	106	27	10	Not Evaluated
BE-GTC-018	Blue Earth	106	27	10	Not Evaluated
BE-GTC-019	Blue Earth	106	27	10	Not Evaluated
BE-JUD-001	Blue Earth	109	28	33	Not Evaluated
BE-JUD-002	Blue Earth	108	28	4	Not Evaluated
BE-JUD-003	Blue Earth	108	28	4	Not Evaluated
BE-JUD-004	Blue Earth	108	28	4	Not Evaluated
BE-JUD-005	Blue Earth	109	28	33	Not Evaluated
BE-JUD-006	Blue Earth	108	28	4	Not Evaluated
BE-JUD-007	Blue Earth	108	28	15	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
BE-JUD-008	Blue Earth	108	28	15	Not Evaluated
BE-JUD-013	Blue Earth	109	28	33	Not Evaluated
BE-LCL-001	Blue Earth	107	29	26	Not Evaluated
BE-LCL-003	Blue Earth	107	29	14	Not Evaluated
BE-LCL-004	Blue Earth	107	29	11	Not Evaluated
BE-LIM-001	Blue Earth	109	26	31	Not Evaluated
BE-LIM-002	Blue Earth	109	26	31	Not Evaluated
BE-LIM-003	Blue Earth	109	26	31	Not Evaluated
BE-LIM-005	Blue Earth	109	26	30	Not Evaluated
BE-LIM-006	Blue Earth	109	26	26	Not Evaluated
BE-LIM-008	Blue Earth	109	26	27	Not Evaluated
BE-LIM-009	Blue Earth	109	26	32	Not Evaluated
BE-LIM-011	Blue Earth	109	26	30	Not Evaluated
BE-LIM-018	Blue Earth	109	26	28	Not Evaluated
BE-LIM-019	Blue Earth	109	26	28	Not Evaluated
BE-LIM-020	Blue Earth	109	26	28	Not Evaluated
BE-LIM-021	Blue Earth	109	26	27	Not Evaluated
BE-LIM-022	Blue Earth	109	26	34	Not Evaluated
BE-LIM-023	Blue Earth	109	26	33	Not Evaluated
BE-LIM-024	Blue Earth	109	26	33	Not Evaluated
BE-LIM-025	Blue Earth	109	26	33	Not Evaluated
BE-LIM-026	Blue Earth	109	26	32	Not Evaluated
BE-LIM-027	Blue Earth	109	26	34	Not Evaluated
BE-LIM-028	Blue Earth	109	26	33	Not Evaluated
BE-LIM-029	Blue Earth	109	26	32	Not Evaluated
BE-LIM-030	Blue Earth	109	26	33	Not Evaluated
BE-LIM-031	Blue Earth	109	26	34	Not Evaluated
BE-LIM-033	Blue Earth	109	26	32	Not Evaluated
BE-LIM-034	Blue Earth	109	26	32	Not Evaluated
BE-LIM-035	Blue Earth	109	26	34	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
BE-LIM-040	Blue Earth	109	26	32	Not Evaluated
BE-LIM-041	Blue Earth	109	26	32	Not Evaluated
BE-LIM-042	Blue Earth	109	26	33	Not Evaluated
BE-LIM-043	Blue Earth	109	26	33	Not Evaluated
BE-LIM-044	Blue Earth	109	26	33	Not Evaluated
BE-LIM-045	Blue Earth	109	26	33	Not Evaluated
BE-LIM-046	Blue Earth	109	26	33	Not Evaluated
BE-LYR-001	Blue Earth	106	27	22	Not Evaluated
BE-LYR-002	Blue Earth	106	27	21	Not Evaluated
BE-LYR-003	Blue Earth	106	27	10	Not Evaluated
BE-MED-004	Blue Earth	106	25	20	Not Evaluated
BE-MED-005	Blue Earth	106	25	32	Not Evaluated
BE-MED-007	Blue Earth	106	25	20	Not Evaluated
BE-MKC-336	Blue Earth	108	26	6	Not Evaluated
BE-MKC-368	Blue Earth	108	27	14	Not Evaluated
BE-MKC-369	Blue Earth	108	27	14	Not Evaluated
BE-MKT-001	Blue Earth	108	26	24	Not Evaluated
BE-MKT-004	Blue Earth	108	26	24	Not Evaluated
BE-MKT-013	Blue Earth	108	26	2	Not Evaluated
BE-MKT-014	Blue Earth	108	26	36	Not Evaluated
BE-MKT-015	Blue Earth	108	26	3	Not Evaluated
BE-MKT-016	Blue Earth	108	26	3	Not Evaluated
BE-MKT-017	Blue Earth	108	26	3	Not Evaluated
BE-MKT-022	Blue Earth	108	26	3	Not Evaluated
BE-MKT-027	Blue Earth	108	26	11	Not Evaluated
BE-MKT-028	Blue Earth	108	26	10	Not Evaluated
BE-MKT-029	Blue Earth	108	26	2	Not Evaluated
BE-MKT-030	Blue Earth	108	26	11	Not Evaluated
BE-MKT-034	Blue Earth	108	26	35	Not Evaluated
BE-MKT-035	Blue Earth	108	26	3	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
BE-MKT-037	Blue Earth	108	26	3	Not Evaluated
BE-MPT-010	Blue Earth	105	26	25	Not Evaluated
BE-PMT-001	Blue Earth	105	29	2	Not Evaluated
BE-PMT-002	Blue Earth	105	29	13	Not Evaluated
BE-PMT-006	Blue Earth	105	29	12	Not Evaluated
BE-RAP-001	Blue Earth	107	27	23	Not Evaluated
BE-RAP-002	Blue Earth	107	27	8	Not Evaluated
BE-RAP-003	Blue Earth	107	27	8	Not Evaluated
BE-RAP-004	Blue Earth	107	27	21	Not Evaluated
BE-RAP-005	Blue Earth	107	27	15	Not Evaluated
BE-RAP-006	Blue Earth	107	27	17	Not Evaluated
BE-RAP-013	Blue Earth	107	27	8	Considered Eligible
BE-RAP-014	Blue Earth	107	27	3	Not Evaluated
BE-RAP-015	Blue Earth	107	27	4	Not Evaluated
BE-RAP-016	Blue Earth	107	27	3	Not Evaluated
BE-RAP-017	Blue Earth	107	27	4	Not Evaluated
BE-SBT-002	Blue Earth	108	27	15	Not Evaluated
BE-SBT-005	Blue Earth	108	27	21	Not Evaluated
BE-SBT-007	Blue Earth	108	27	14	Not Evaluated
BE-SBT-009	Blue Earth	108	27	20	Not Evaluated
BE-SBT-010	Blue Earth	108	27	20	Listed
BE-SBT-011	Blue Earth	108	27	21	Listed
BE-SBT-012	Blue Earth	108	27	20	Listed
BE-SBT-013	Blue Earth	108	27	20	Listed
BE-SBT-014	Blue Earth	108	27	20	Listed
BE-SBT-015	Blue Earth	108	27	20	Listed
BE-SBT-016	Blue Earth	108	27	20	Not Evaluated
BE-SBT-017	Blue Earth	108	27	20	Not Evaluated
BE-SBT-018	Blue Earth	108	27	20	Not Evaluated
BE-SBT-019	Blue Earth	108	27	20	Listed

Site Number	County	Township	Range	Section	NRHP Status
BE-SBT-020	Blue Earth	108	27	20	Listed
BE-SBT-021	Blue Earth	108	27	21	Listed
BE-SBT-022	Blue Earth	108	27	21	Listed
BE-SBT-023	Blue Earth	108	27	20	Not Evaluated
BE-SBT-025	Blue Earth	108	27	30	Not Evaluated
BE-SBT-026	Blue Earth	108	27	30	Considered Eligible
BE-SBT-028	Blue Earth	108	27	20, 21	Listed
BE-SBT-029	Blue Earth	108	27	16, 20, 21	Not Evaluated
BE-SBT-030	Blue Earth	108	27	15	Not Evaluated
BE-SCC-001	Blue Earth	107	25	8	Not Evaluated
BE-SCC-003	Blue Earth	107	25	8	Not Evaluated
BE-SCC-004	Blue Earth	107	25	8	Not Evaluated
BE-SCC-005	Blue Earth	107	25	8	Not Evaluated
BE-SCC-006	Blue Earth	107	25	8	Not Evaluated
BE-SCC-007	Blue Earth	107	25	17	Not Evaluated
BE-SCC-009	Blue Earth	107	25	8	Not Evaluated
BE-STL-001	Blue Earth	105	27	11	Not Evaluated
BE-STL-004	Blue Earth	105	27	15	Listed
BE-STL-005	Blue Earth	105	27	14	Not Evaluated
FA-BAR-001	Fairbault	103	26	5	Not Evaluated
FA-DVT-001	Fairbault	104	27	11	Not Evaluated
FA-DVT-002	Fairbault	104	27	16	Not Evaluated
FA-DVT-004	Fairbault	104	27	16	Not Evaluated
FA-DVT-006	Fairbault	104	27	17	Not Evaluated
FA-DVT-007	Fairbault	104	27	9	Not Evaluated
FA-DVT-009	Fairbault	104	27	34	Not Evaluated
FA-DVT-010	Fairbault	104	27	2	Not Evaluated
FA-DVT-011	Fairbault	104	27	31	Listed
FA-DVT-012	Fairbault	104	27	9	Not Evaluated
FA-DVT-014	Fairbault	104	27	28	Not Evaluated

Site Number	County	Township	Range	Section	NRHP Status
FA-PRS-001	Fairbault	103	27	22	Not Evaluated
FA-VER-001	Fairbault	103	28	11	Not Evaluated
FA-VER-002	Fairbault	103	28	24	Not Evaluated
FA-VER-004	Fairbault	103	28	7	Not Evaluated
FA-VER-005	Fairbault	103	28	18	Not Evaluated
FA-VER-006	Fairbault	103	28	18	Not Evaluated
FA-VER-007	Fairbault	103	28	18	Not Evaluated
FA-VER-008	Fairbault	103	28	7	Not Evaluated
FA-VER-009	Fairbault	103	28	18	Not Evaluated
FA-VER-015	Fairbault	103	28	13	Not Evaluated
FA-WBT-002	Fairbault	104	28	7	Not Evaluated
NL-BEL-001	Nicollet	108	27	5	Not Evaluated
NL-BEL-002	Nicollet	108	27	4	Not Evaluated
NL-BEL-003	Nicollet	108	27	4	Not Evaluated
NL-BEL-004	Nicollet	108	27	3	Not Evaluated
NL-BEL-007	Nicollet	109	27	30	Not Evaluated
NL-BEL-008	Nicollet	109	27	30	Not Evaluated
NL-BEL-009	Nicollet	109	27	19, 29, 30, 32	Not Evaluated
NL-BEL-010	Nicollet	109	27	29	Not Evaluated
NL-BEL-011	Nicollet	109	27	29	Considered Eligible
NL-BEL-012	Nicollet	109	27	31	Not Evaluated
NL-BEL-013	Nicollet	109	27	29	Not Evaluated
NL-BEL-014	Nicollet	109	27	33	Not Evaluated
NL-BEL-015	Nicollet	109	27	33	Considered Eligible
NL-BEL-016	Nicollet	109	27	33	Not Evaluated
NL-BEL-018	Nicollet	109	27	32	Not Evaluated
NL-NCT-054	Nicollet	109	28	25	Not Evaluated
NL-NCT-059	Nicollet	109	28	33	Not Evaluated
XX-ROD-016	Multiple	Trunk Hwy 14			Not Evaluated

Appendix H

Blanding's Turtle Factsheet

Environmental Review Fact Sheet Series

Endangered, Threatened, and Special Concern Species of Minnesota

Blanding's Turtle
(Emydoidea blandingii)

Minnesota Status: Threatened
Federal Status: none

State Rank¹: S2
Global Rank¹: G4

HABITAT USE

Blanding's turtles need both wetland and upland habitats to complete their life cycle. The types of wetlands used include ponds, marshes, shrub swamps, bogs, and ditches and streams with slow-moving water. In Minnesota, Blanding's turtles are primarily marsh and pond inhabitants. Calm, shallow water bodies (Type 1-3 wetlands) with mud bottoms and abundant aquatic vegetation (e.g., cattails, water lilies) are preferred, and extensive marshes bordering rivers provide excellent habitat. Small temporary wetlands (those that dry up in the late summer or fall) are frequently used in spring and summer -- these fishless pools are amphibian and invertebrate breeding habitat, which provides an important food source for Blanding's turtles. Also, the warmer water of these shallower areas probably aids in the development of eggs within the female turtle. Nesting occurs in open (grassy or brushy) sandy uplands, often some distance from water bodies. Frequently, nesting occurs in traditional nesting grounds on undeveloped land. Blanding's turtles have also been known to nest successfully on residential property (especially in low density housing situations), and to utilize disturbed areas such as farm fields, gardens, under power lines, and road shoulders (especially of dirt roads). Although Blanding's turtles may travel through woodlots during their seasonal movements, shady areas (including forests and lawns with shade trees) are not used for nesting. Wetlands with deeper water are needed in times of drought, and during the winter. Blanding's turtles overwinter in the muddy bottoms of deeper marshes and ponds, or other water bodies where they are protected from freezing.

LIFE HISTORY

Individuals emerge from overwintering and begin basking in late March or early April on warm, sunny days. The increase in body temperature which occurs during basking is necessary for egg development within the female turtle. Nesting in Minnesota typically occurs during June, and females are most active in late afternoon and at dusk. Nesting can occur as much as a mile from wetlands. The nest is dug by the female in an open sandy area and 6-15 eggs are laid. The female turtle returns to the marsh within 24 hours of laying eggs. After a development period of approximately two months, hatchlings leave the nest from mid-August through early-October. Nesting females and hatchlings are often at risk of being killed while crossing roads between wetlands and nesting areas. In addition to movements associated with nesting, all ages and both sexes move between wetlands from April through November. These movements peak in June and July and again in September and October as turtles move to and from overwintering sites. In late autumn (typically November), Blanding's turtles bury themselves in the substrate (the mud at the bottom) of deeper wetlands to overwinter.

IMPACTS / THREATS / CAUSES OF DECLINE

- loss of wetland habitat through drainage or flooding (converting wetlands into ponds or lakes)
- loss of upland habitat through development or conversion to agriculture
- human disturbance, including collection for the pet trade* and road kills during seasonal movements
- increase in predator populations (skunks, racoons, etc.) which prey on nests and young

*It is illegal to possess this threatened species.

RECOMMENDATIONS FOR AVOIDING AND MINIMIZING IMPACTS

These recommendations apply to typical construction projects and general land use within Blanding's turtle habitat, and are provided to help local governments, developers, contractors, and homeowners minimize or avoid detrimental impacts to Blanding's turtle populations. **List 1** describes minimum measures which we recommend to prevent harm to Blanding's turtles during construction or other work within Blanding's turtle habitat. **List 2** contains recommendations which offer even greater protection for Blanding's turtles populations; this list should be used *in addition to the first list* in areas which are known to be of state-wide importance to Blanding's turtles (contact the DNR's Natural Heritage and Nongame Research Program if you wish to determine if your project or home is in one of these areas), or in any other area where greater protection for Blanding's turtles is desired.

List 1. Recommendations for all areas inhabited by Blanding's turtles.	List 2. Additional recommendations for areas known to be of state-wide importance to Blanding's turtles.
GENERAL	
A flyer with an illustration of a Blanding's turtle should be given to all contractors working in the area. Homeowners should also be informed of the presence of Blanding's turtles in the area.	Turtle crossing signs can be installed adjacent to road-crossing areas used by Blanding's turtles to increase public awareness and reduce road kills.
Turtles which are in imminent danger should be moved, by hand, out of harms way. Turtles which are not in imminent danger should be left undisturbed.	Workers in the area should be aware that Blanding's turtles nest in June, generally after 4pm, and should be advised to minimize disturbance if turtles are seen.
If a Blanding's turtle nests in your yard, do not disturb the nest.	If you would like to provide more protection for a Blanding's turtle nest on your property, see "Protecting Blanding's Turtle Nests" on page 3 of this fact sheet.
Silt fencing should be set up to keep turtles out of construction areas. It is <u>critical</u> that silt fencing be removed after the area has been revegetated.	Construction in potential nesting areas should be limited to the period between September 15 and June 1 (this is the time when activity of adults and hatchlings in upland areas is at a minimum).
WETLANDS	
Small, vegetated temporary wetlands (Types 2 & 3) should not be dredged, deepened, filled, or converted to storm water retention basins (these wetlands provide important habitat during spring and summer).	Shallow portions of wetlands should not be disturbed during prime basking time (mid morning to mid- afternoon in May and June). A wide buffer should be left along the shore to minimize human activity near wetlands (basking Blanding's turtles are more easily disturbed than other turtle species).
Wetlands should be protected from pollution; use of fertilizers and pesticides should be avoided, and run-off from lawns and streets should be controlled. Erosion should be prevented to keep sediment from reaching wetlands and lakes.	Wetlands should be protected from road, lawn, and other chemical run-off by a vegetated buffer strip at least 50' wide. This area should be left unmowed and in a natural condition.
ROADS	
Roads should be kept to minimum standards on widths and lanes (this reduces road kills by slowing traffic and reducing the distance turtles need to cross).	Tunnels should be considered in areas with concentrations of turtle crossings (more than 10 turtles per year per 100 meters of road), and in areas of lower density if the level of road use would make a safe crossing impossible for turtles. Contact your DNR Regional Nongame Specialist for further information on wildlife tunnels.
Roads should be ditched, not curbed or below grade. If curbs must be used, 4 inch high curbs at a 3:1 slope are preferred (Blanding's turtles have great difficulty climbing traditional curbs; curbs and below grade roads trap turtles on the road and can cause road kills).	Roads should be ditched, not curbed or below grade.

ROADS cont.	
Culverts between wetland areas, or between wetland areas and nesting areas, should be 36 inches or greater in diameter, and elliptical or flat-bottomed.	Road placement should avoid separating wetlands from adjacent upland nesting sites, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details).
Wetland crossings should be bridged, or include raised roadways with culverts which are 36 in or greater in diameter and flat-bottomed or elliptical (raised roadways discourage turtles from leaving the wetland to bask on roads).	Road placement should avoid bisecting wetlands, or these roads should be fenced to prevent turtles from attempting to cross them (contact your DNR Nongame Specialist for details). This is especially important for roads with more than 2 lanes.
Culverts under roads crossing streams should be oversized (at least twice as wide as the normal width of open water) and flat-bottomed or elliptical.	Roads crossing streams should be bridged.
UTILITIES	
Utility access and maintenance roads should be kept to a minimum (this reduces road-kill potential).	
Because trenches can trap turtles, trenches should be checked for turtles prior to being backfilled and the sites should be returned to original grade.	
LANDSCAPING AND VEGETATION MANAGEMENT	
Terrain should be left with as much natural contour as possible.	As much natural landscape as possible should be preserved (installation of sod or wood chips, paving, and planting of trees within nesting habitat can make that habitat unusable to nesting Blanding's turtles).
Graded areas should be revegetated with native grasses and forbs (some non-natives form dense patches through which it is difficult for turtles to travel).	Open space should include some areas at higher elevations for nesting. These areas should be retained in native vegetation, and should be connected to wetlands by a wide corridor of native vegetation.
Vegetation management in infrequently mowed areas -- such as in ditches, along utility access roads, and under power lines -- should be done mechanically (chemicals should not be used). Work should occur fall through spring (after October 1 st and before June 1 st).	Ditches and utility access roads should not be mowed or managed through use of chemicals. If vegetation management is required, it should be done mechanically, as infrequently as possible, and fall through spring (mowing can kill turtles present during mowing, and makes it easier for predators to locate turtles crossing roads).

Protecting Blanding's Turtle Nests: Most predation on turtle nests occurs within 48 hours after the eggs are laid. After this time, the scent is gone from the nest and it is more difficult for predators to locate the nest. Nests more than a week old probably do not need additional protection, unless they are in a particularly vulnerable spot, such as a yard where pets may disturb the nest. Turtle nests can be protected from predators and other disturbance by covering them with a piece of wire fencing (such as chicken wire), secured to the ground with stakes or rocks. The piece of fencing should measure at least 2 ft. x 2 ft., and should be of medium sized mesh (openings should be about 2 in. x 2 in.). It is **very important** that the fencing be **removed before August 1st** so the young turtles can escape from the nest when they hatch!

REFERENCES

- ¹Association for Biodiversity Information. "Heritage Status: Global, National, and Subnational Conservation Status Ranks." NatureServe. Version 1.3 (9 April 2001). <http://www.natureserve.org/ranking.htm> (15 April 2001).
- Coffin, B., and L. Pfannmuller. 1988. Minnesota's Endangered Flora and Fauna. University of Minnesota Press, Minneapolis, 473 pp.

REFERENCES (cont.)

- Moriarty, J. J., and M. Linck. 1994. Suggested guidelines for projects occurring in Blanding's turtle habitat. Unpublished report to the Minnesota DNR. 8 pp.
- Oldfield, B., and J. J. Moriarty. 1994. Amphibians and Reptiles Native to Minnesota. University of Minnesota Press, Minneapolis, 237 pp.
- Sajwaj, T. D., and J. W. Lang. 2000. Thermal ecology of Blanding's turtle in central Minnesota. *Chelonian Conservation and Biology* 3(4):626-636.

Appendix I

Detailed Map Book

Appendix I is published as a stand-alone document. It is provided with all print copies of this EIS. Electronic copies of Appendix I, and the entire EIS, are available on the Department of Commerce's website:

<https://mn.gov/commerce/energyfacilities>. Select "Transmission Lines" and then select "Huntley to Wilmarth Transmission 345 kV Transmission Line Project." It can also be viewed through the Minnesota Public Utilities Commission's website: <http://mn.gov/puc>. Select "eDockets," enter the year ("17") and the docket number ("184" or "185"), and then select "Search."

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Appendix J

Route Analysis Data Tables

								Audubon Important Bird Areas										Cultural Resources - Archaeological Sites			Cultural Resources - Historical Sites			Federal Emergency Management Agency 100-Year Floodplain crossing (> 1000 ft span)	Federal Emergency Management Agency Floodplain				
																									100-Year Floodplain		500-Year Floodplain		
			Airports			Boat Access				Cemeteries				Churches											100-Year Floodplain		500-Year Floodplain		
			Within 75 ft	Within 500 ft	Within 1 mi	Within 75 ft	Within 500 ft	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Within 75 ft	Within 200 ft	Within 500 ft	Within 1000 ft	Within 75 ft	Within 200 ft	Within 500 ft	Within 1000 ft	Within 75 ft	Within 500 ft	Within 1 mi	Within 75 ft	Within 500 ft	Within 1 mi	Crossing	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	
Route ID	Type	Length (mi)	Count	Count	Count	Count	Count	Area (ac)	Area (ac)	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Area (ac)	Area (ac)	Area (ac)	Area (ac)	
Purple	Route	51.6	0	0	0	0	0	90.2	600.5	0	0	0	0	0	0	0	0	2	3	61	0	0	37	4	37.4	253.5	14.5	101.6	
Green	Route	45.3	0	0	0	0	0	68.9	457.8	0	0	0	0	0	0	0	0	0	1	66	0	1	68	4	31.7	215.9	14.7	99.8	
Red	Route	46.5	0	0	0	0	1	68.9	457.8	0	0	0	0	0	0	0	0	0	3	65	0	0	76	4	43.0	311.0	14.7	99.8	
Blue	Route	57.1	0	0	1	0	0	1.2	13.4	0	0	0	1	0	0	0	0	0	3	43	0	2	65	3	23.7	161.8	0.7	17.0	
Purple-E-Red	Route	54.1	0	0	0	0	1	90.2	610.7	0	0	0	0	0	0	0	0	0	3	67	0	0	84	4	41	293.1	14.5	101.6	
A	Segment	3.8	0	0	0	0	0	34.0	233.9	0	0	0	0	0	0	0	0	0	0	6	0	0	11	0	0	0	0	0.3	
B	Segment	2.9	0	0	0	0	0	4.7	64.7	0	0	0	0	0	0	0	0	0	0	3	0	0	10	0	0	0	0	0.3	
Red/Green Equivalent	Segment Equivalent	3.0	0	0	0	0	0	23.1	162.2	0	0	0	0	0	0	0	0	0	0	3	0	0	10	0	0	0	0	0.3	
D	Segment	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	1.1	8.7	0	0	
E	Segment	18.4	0	0	0	0	0	57.9	395.9	0	0	0	0	0	0	0	0	0	0	34	0	0	45	1	10.5	70.1	0.4	7.8	
E2	Segment	18.3	0	0	0	0	0	57.9	395.9	0	0	0	0	0	0	0	0	0	0	31	0	0	42	1	10.5	70.1	0.4	7.8	
Red/Green Equivalent	Segment Equivalent	10.8	0	0	0	0	0	36.5	242.9	0	0	0	0	0	0	0	0	0	0	32	0	0	37	1	12.6	88.0	0.6	6.0	
F	Segment	3.8	0	0	0	0	1	65.9	446.6	0	0	0	0	0	0	1	1	0	1	11	0	4	8	1	6.3	44.3	2.9	18.0	
Purple Equivalent	Segment Equivalent	2.7	0	0	0	0	0	45.9	313.4	0	0	0	0	0	0	0	0	0	0	4	0	0	3	1	9.5	62.3	0.4	7.8	
G	Segment	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	6	0	0	7	0	0	0	0	0	
Blue Equivalent	Segment Equivalent	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	5	0	0	7	0	0	0	0	0	
H	Segment	7.3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1.6	11.2	0	0	
J	Segment	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1.9	17.1	0	0	
K	Segment	5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0	1.6	10.7	0	0	
L	Segment	6.4	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2.0	13.2	0	0	
M	Segment	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	2.0	13.2	0	0	
Purple Equivalent	Segment Equivalent	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1.9	18.3	0	0	
I	Segment	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Segment Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N	Segment	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	9.9	22.8	0	0	
Purple Equivalent	Segment Equivalent	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3.1	0	0	
O	Segment	5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	
Green Equivalent	Segment Equivalent	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	1	0	0	0	0	0	
P	Segment	8.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	
Blue Equivalent	Segment Equivalent	8.3	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	
Q	Segment	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	20	0	0	2	1	8.8	67.0	0	0	
Red/Blue Equivalent	Segment Equivalent	5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	22	0	0	4	1	3.6	24.0	0	0	
R	Segment	5.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	20	0	0	2	1	8.8	67.0	0	0	
Red Equivalent	Segment Equivalent	6.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	22	0	0	4	1	3.6	24.0	0	0	
Y	Segment	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	5	0	9.1	90.0	0	0	
Red Equivalent	Segment Equivalent	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	5	0	0	0	0	0	
AA1	Alignment	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	17	0	0	0	0	0	
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0	17	0	0	0	0	0	
AA2	Alignment	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	
Blue Equivalent	Alignment Equivalent	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	
AA3-a	Alignment	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	26	0	0	2	0	0	10.6	0	0	
AA3-b	Alignment	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	26	0	0	2	0	0	11.4	0	0	
Purple Equivalent	Alignment Equivalent	1.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	26	0	0	2	0	0	1.0	13.9	0	0

			Calcareous Fens		Hospitals				Houses (Residences)				Impaired Lakes			Impaired Streams			Karst Features by Type (Spring, Stream Sink/Sieve, Sinkhole, Total)							
																			Spring		Stream Sink/Sieve		Sinkhole		Total	
			Within 75 ft	Within 500 ft	Within 75 ft	Within 200 ft	Within 500 ft	Within 1000 ft	0-75 ft	75-200 ft	200-500 ft	500-1000 ft	Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft
Route ID	Type	Length (mi)	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)	Count	Count	Count	Count	Count	Count	Count	Count
Purple	Route	51.6	0	0	0	0	0	0	1	3	12	35	0	0	0	7	1349.5	10521.4	0	0	0	0	0	0	0	0
Green	Route	45.3	0	0	0	0	0	0	0	19	46	68	0	0	0	4	862.5	6272.8	0	0	0	0	0	0	0	0
Red	Route	46.5	0	0	0	0	0	0	0	24	38	64	0	0	8.9	9	1822.3	18807.3	0	0	0	0	0	0	0	0
Blue	Route	57.1	0	0	0	0	0	0	0	3	10	30	0	0	0	5	1054.0	8354.4	0	0	0	0	0	0	0	0
Purple-E-Red	Route	54.1	0	0	0	0	0	0	0	8	19	34	0	0	8.9	10	2072.8	20434.5	0	0	0	0	0	0	0	0
A	Segment	3.8	0	0	0	0	0	0	0	0	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
B	Segment	2.9	0	0	0	0	0	0	0	0	4	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Red/Green Equivalent	Equivalent	3.0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D	Segment	2.0	0	0	0	0	0	0	0	0	2	4	0	0	0	1	181.3	1390.3	0	0	0	0	0	0	0	0
E	Segment	18.4	0	0	0	0	0	0	0	2	11	15	0	0	0	3	553.9	3657.3	0	0	0	0	0	0	0	0
E2	Segment	18.3	0	0	0	0	0	0	0	3	12	14	0	0	0	3	553.9	3657.3	0	0	0	0	0	0	0	0
Red/Green Equivalent	Equivalent	10.8	0	0	0	0	0	0	0	18	30	45	0	0	0	2	303.5	2030.1	0	0	0	0	0	0	0	0
F	Segment	3.8	0	0	0	0	0	0	0	2	12	23	0	0	0	1	151.0	1005.6	0	0	0	0	0	0	0	0
Purple Equivalent	Equivalent	2.7	0	0	0	0	0	0	0	0	0	5	0	0	0	1	231.1	1489.5	0	0	0	0	0	0	0	0
G	Segment	3.4	0	0	0	0	0	0	0	2	13	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Equivalent	Equivalent	2.9	0	0	0	0	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H	Segment	7.3	0	0	0	0	0	0	0	0	2	3	0	0	0	2	330.3	3573.9	0	0	0	0	0	0	0	0
J	Segment	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	150.6	1030.1	0	0	0	0	0	0	0	0
K	Segment	5.4	0	0	0	0	0	0	0	0	2	2	0	0	0	2	330.3	3573.9	0	0	0	0	0	0	0	0
L	Segment	6.4	0	0	0	0	0	0	0	0	1	1	0	0	0	2	368.1	4366.7	0	0	0	0	0	0	0	0
M	Segment	6.4	0	0	0	0	0	0	0	0	3	0	0	0	0	2	368.1	4366.7	0	0	0	0	0	0	0	0
Purple Equivalent	Equivalent	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	150.5	1749.6	0	0	0	0	0	0	0	0
I	Segment	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purple Equivalent	Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N	Segment	3.2	0	0	0	0	0	0	0	1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Purple Equivalent	Equivalent	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
O	Segment	5.1	0	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Equivalent	Equivalent	4.8	0	0	0	0	0	0	0	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P	Segment	8.7	0	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Equivalent	Equivalent	8.3	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Q	Segment	4.8	0	0	0	0	0	0	0	0	2	2	0	0	0	2	906.1	4058.3	0	0	0	0	0	0	0	0
Red/Blue Equivalent	Equivalent	5.1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	385.9	1670.3	0	0	0	0	0	0	0	0
R	Segment	5.8	0	0	0	0	0	0	0	0	1	3	0	0	0	2	906.1	4058.3	0	0	0	0	0	0	0	0
Red Equivalent	Equivalent	6.1	0	0	0	0	0	0	0	0	1	1	0	0	0	1	385.9	1670.3	0	0	0	0	0	0	0	0
Y	Segment	2.9	0	0	0	0	0	0	0	0	2	1	0	0	0	5	655.6	10353.5	0	0	0	0	0	0	0	0
Red Equivalent	Equivalent	3.0	0	0	0	0	0	0	0	1	2	1	0	0	0	1	232.4	2661.3	0	0	0	0	0	0	0	0
AA1	Alignment	0.6	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AA2	Alignment	0.6	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Blue Equivalent	Equivalent	0.5	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AA3-a	Alignment	1.1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AA3-b	Alignment	1.1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	523.8	0	0	0	0	0	0	0	0
Purple Equivalent	Equivalent	1.1	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0

			Minnesota Biological Survey Railroad ROW Prairies			Minnesota Biological Survey Sites of Biodiversity Significance by Type (Moderate, High, Total)									MN Department of Natural Resources Conservation Easements by Type (CREP II, PWP, RIM, Total)												MN Department of Natural Resources Game Refuge		
						Moderate			High			Total			Federal CREP Easements			State RIM Easements			MN Department of Natural Resources Native Prairie Bank Easements			Total					
Route ID	Type	Length (mi)	Crossing Count	Within 75 ft Length (ft)	Within 500 ft Length (ft)	Crossing >1000 ft Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing >1000 ft Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing >1000 ft Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)	Crossing Count	Within 75 ft Area (ac)	Within 500 ft Area (ac)
Purple	Route	51.6	0	0	0	0	14.6	93.8	3	22.3	139.2	3	36.9	233	2	17.8	117.6	0	0.3	8.5	0	0	0	2	18.1	126.1	1	19.4	133.1
Green	Route	45.3	0	0	360.2	1	7.0	56.2	1	14.8	94.4	2	21.8	150.6	2	13.0	91.1	1	9.3	63.4	0	0	0	3	22.4	154.6	1	19.4	133.1
Red	Route	46.5	0	0	0	1	7.2	56.4	1	14.8	94.4	2	22	150.8	1	7.6	42.0	1	9.3	63.0	0	0	0	2	17.0	105.1	1	19.4	133.1
Blue	Route	57.1	1	150.9	1005.8	1	3.9	30.4	0	0	11.7	1	3.9	42.1	1	7.5	43.0	1	0.6	5.1	0	0	0	2	8.1	48.1	1	17.1	120.3
Purple-E-Red	Route	54.1	0	0	0	3	9.7	78.7	2	22.3	141.5	5	32	220.2	1	7.6	42.0	0	0	0	0	0	0	1	7.6	42.0	1	19.4	133.1
A	Segment	3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
B	Segment	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Red/Green Equivalent	Equivalent	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
D	Segment	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
E	Segment	18.4	0	0	0	2	6.1	49.7	1	7.5	47.0	3	13.6	96.7	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
E2	Segment	18.3	0	0	0	1	2.3	42.8	1	7.5	47.0	0	9.8	89.8	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Red/Green Equivalent	Equivalent	10.8	0	0	0	0	3.5	27.3	0	0	0	2	3.5	27.3	0	0.0	0	1	9.3	63.0	0	0	0	1	9.3	63.0	0	0	0
F	Segment	3.8	0	0	0	0	0	0	0	0.7	9.5	0	0.7	9.5	0	0.0	0	0	0	0	0	0.2	12.1	0	0.2	12.1	0	0	0
Purple Equivalent	Equivalent	2.7	0	0	0	0	0	0	1	7.5	44.8	1	7.5	44.8	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
G	Segment	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Blue Equivalent	Equivalent	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
H	Segment	7.3	0	0	0	0	0	0	0	0	0	0	0	0	1	8.9	59.8	0	0	0	0	0	0	1	8.9	59.8	0	0	0
J	Segment	5.2	0	0	0	0	0	0	0	0	0	0	0	0	1	8.9	59.5	0	0	0	0	0	0	1	8.9	59.5	0	0	0
K	Segment	5.4	0	0	0	0	0	0	0	0	0	0	0	0	1	8.9	59.5	0	0	0	0	0	0	1	8.9	59.5	0	0	0
L	Segment	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.6	0	0	0	0	0.0	6.6	0	0	0
M	Segment	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6.6	0	0	0	0	0.0	6.6	0	0	0
Purple Equivalent	Equivalent	5.2	0	0	0	0	0	0	0	0	0	0	0	0	1	8.9	59.5	0	0	0	0	0	0	1	8.9	59.5	0	0	0
I	Segment	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Purple Equivalent	Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
N	Segment	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Purple Equivalent	Equivalent	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
O	Segment	5.1	0	0	0	0	0	0	0	0	0	0	0	0	1	4.4	17.9	0	0	0	0	0	0	1	4.4	17.9	0	0	0
Green Equivalent	Equivalent	4.8	0	0	0	0	0	0	0	0	0	0	0	0	1	4.0	22.4	0	0	0	0	0	0	1	4.0	22.4	0	0	0
P	Segment	8.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Blue Equivalent	Equivalent	8.3	1	150.9	1005.8	0	0.4	2.5	0	0	0	0	0.4	2.5	0	0	0.5	0	0	0	0	0	0	0	0.0	0.5	0	0	0
Q	Segment	4.8	0	0	0	0	5.8	48.3	0	0	0	0	5.8	48.3	0	0	0.0	0	0	6.9	0	0	0	0	0.0	6.9	0	0	0
Red/Blue Equivalent	Equivalent	5.1	0	0	0	1	3.5	27.9	0	0	0	1	3.5	27.9	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
R	Segment	5.8	0	0	0	0	7.9	60.1	0	0	0	0	7.9	60.1	0	5.6	36.7	1	1.6	11.3	0	0	0	1	7.1	48.0	0	0	0
Red Equivalent	Equivalent	6.1	0	0	0	1	3.5	27.9	0	0	0	1	3.5	27.9	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Y	Segment	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Red Equivalent	Equivalent	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.3	2.1	0	0	0	0	0	0	0	0.3	2.1	0	0	0
AA1	Alignment	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
AA2	Alignment	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
Blue Equivalent	Alignment Equivalent	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0	0	0	0
AA3-a	Alignment	1.1	0	0	0	0	0	0.5	0	0	0	0	0	0.5	0	0	0	0	0	5.8	0	0	0	0	0.0	5.8	0	0	0
AA3-b	Alignment	1.1	0	0	0	0	0	0.8	0	0	0	0	0	0.8	0	0	0.2	0	0.0	3.6	0	0	0	0	0.0	3.8	0	0	0

			Minnesota Biological Survey Native Plant Communities			MN Department of Natural Resources Scientific and Natural Areas			MN Department of Natural Resources Wildlife Management Areas			MN Department of Natural Resources State Trails			MN Department of Natural Resources Shallow Wildlife Lakes			MN State Forest Campgrounds		MN State Park Trails			National Hydrography Dataset Watercourses			National Hydrography Dataset Waterbodies		
			Crossing > 1000 ft	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft
Route ID	Type	Length (mi)	Count	Area (ac)	Area (ac)	Count	Area (ac)	Area (ac)	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)	Count	Area (ac)	Area (ac)	Count	Count	Count	Length (ft)	Length (ft)	Count	Length (ft)	Length (ft)	Count	Area (ac)	Area (ac)
Purple	Route	51.6	1	14.6	74.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	6,790	45,206	1	0.4	2.9	
Green	Route	45.3	1	14.2	83.4	0	0	0	1	3.1	27.8	1	154	1009	0	0	0.2	0	0	0	0	17	3,229	30,417	0	0	0	
Red	Route	46.5	1	14.2	82.4	0	0	0	1	5.6	54.8	1	154	1009	0	0.1	21.1	0	0	0	0	18	4,254	42,001	4	2.7	31.0	
Blue	Route	57.1	0	2.9	37.4	0	0	0	0	0	2.0	1	1280	3820	0	0.3	14.0	0	0	0	0	41	15,041	63,169	1	0.5	19.3	
Purple-E-Red	Route	54.1	2	16.2	114.7	0	0	0	1	5.6	54.8	0	0	976	0	0.1	21.1	0	0	0	0	22	5,377	44,356	5	3.1	38.8	
A	Segment	3.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	161	1,729	0	0	0		
B	Segment	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Red/Green Equivalent	Segment Equivalent	3.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3,970	0	0	0	
D	Segment	2.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	181	1,309	0	0	0		
E	Segment	18.4	1	4.6	50.7	0	0	0	0	0	0	0	0	976	0	0	0	0	0	0	8	1,747	11,035	1	0.4	7.8		
E2	Segment	18.3	1	4.3	43.4	0	0	0	0	0	0	0	0	976	0	0	0	0	0	0	8	1,747	11,035	1	0.4	7.8		
Red/Green Equivalent	Segment Equivalent	10.8	0	2.6	18.4	0	0	0	0	0	0	1	154	1009	0	0	0	0	0	0	4	624	8,680	0	0	0		
F	Segment	3.8	0	0.7	6.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	1,446	6,882	0	0	1.8		
Purple Equivalent	Segment Equivalent	2.7	0	3.4	16.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1,018	6,379	1	0.3	2.5			
G	Segment	3.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	152	1,134	0	0	0		
Blue Equivalent	Segment Equivalent	2.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	603	5,373	0	0	0		
H	Segment	7.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	498	5,240	0	0	0		
J	Segment	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	816	6,552	0	0	0		
K	Segment	5.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	330	3,850	0	0	0		
L	Segment	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	1,290	12,907	0	0	0		
M	Segment	6.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	712	8,337	0	0	0		
Purple Equivalent	Segment Equivalent	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	400	4,483	0	0	0		
I	Segment	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Segment Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N	Segment	3.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	6,076	10,413	0	0	0		
Purple Equivalent	Segment Equivalent	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1,540	0	0	0		
O	Segment	5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	303	3,713	1	0.2	3.0		
Green Equivalent	Segment Equivalent	4.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	802	5,641	0	0	0		
P	Segment	8.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	942	11,837	0	0	0		
Blue Equivalent	Segment Equivalent	8.3	0	0.4	2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	665	6,518	0	0	0		
Q	Segment	4.8	0	0	5.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	930	7,161	0	0	0.9		
Red/Blue Equivalent	Segment Equivalent	5.1	0	2.5	23.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	688	3,504	1	0.4	5.0		
R	Segment	5.8	0	1.0	6.7	0	0	0	0	0	0	0	0	0	1	1.3	8.0	0	0	0	4	751	6,104	1	1.6	13.0		
Red Equivalent	Segment Equivalent	6.1	0	2.5	23.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	838	4,510	1	0.4	5.0		
Y	Segment	2.9	0	0	0	0	0	0	4	6.3	50.0	0	0	0	1	3.0	27.0	0	0	0	7	984	12,453	0	0	0.9		
Red Equivalent	Segment Equivalent	3.0	0	0	0	0	0	0	0	0.8	12.2	0	0	0	0	0	6.7	0	0	0	3	654	5,325	0	0	1.0		
AA1	Alignment	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AA2	Alignment	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Blue Equivalent	Alignment Equivalent	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AA3-a	Alianment	1.1	0	0	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

			National Wetland Inventory Wetlands																										
			Crossing (> 1000 ft span)	Forested		Non Forested		Total																					
				Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft																				
			Crossing	75 ft	500 ft	75 ft	500 ft	75 ft	500 ft	Non-Residential Buildings				Nursing Homes				Parks (Local)		Parks (County)					Parks (State)				
Route ID	Type	Length (mi)	Count	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Count	Area (ac)	Count	Area (ac)	Count	Count	Area (ac)	Count	Area (ac)
Purple	Route	51.6	4	6.2	52.3	52.9	319.4	59.1	371.7	1	8	100	192	0	0	0	0	0	0	0	0	0	0	1	1	2.3	1	13.9	
Green	Route	45.3	4	7.0	58.7	38.2	251.8	45.2	310.5	4	30	137	247	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Red	Route	46.5	4	12.8	118.8	48.2	337.7	61	456.5	1	38	150	195	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Blue	Route	57.1	5	19.1	80.1	36.7	278.2	55.8	358.3	4	16	76	208	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple-E-Red	Route	54.1	5	11.1	101	60.8	408.8	71.9	509.9	3	25	122	185	0	0	0	0	0	0	0	0	0	0	1	1	2.3	1	29.4	
A	Segment	3.8	0	0.6	5.7	1.0	3.5	1.6	9.2	0	0	8	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B	Segment	2.9	0	0.5	2.5	0.7	6.3	1.2	8.8	0	0	8	48	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Red/Green Equivalent	Equivalent	3.0	0	1.1	15.5	0.3	4.2	1.4	19.7	0	0	10	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
D	Segment	2.0	0	0	1.5	2.1	14.9	2.1	16.4	3	6	2	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
E	Segment	18.4	1	1.4	9.8	23.5	136.9	24.9	146.7	3	10	40	99	0	0	0	0	0	0	0	0	0	0	1	1	2.3	1	29.4	
E2	Segment	18.3	1	1.4	9.8	26.1	147.6	27.5	157.4	1	10	43	96	0	0	0	0	0	0	0	0	0	0	1	1	2.3	1	29.4	
Red/Green Equivalent	Equivalent	10.8	0	3.1	27.5	10.9	65.7	14	93.2	1	23	68	109	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
F	Segment	3.8	0	0.3	6.1	3.9	31.9	4.3	38	1	2	28	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Equivalent	2.7	1	0.4	4.2	12.3	73.5	12.6	77.7	0	0	4	29	0	0	0	0	0	0	0	0	0	0	1	1	2.3	1	13.9	
G	Segment	3.4	1	0.8	14.5	4.1	18.8	4.8	33.3	0	2	72	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Blue Equivalent	Equivalent	2.9	2	8.4	22.0	3.8	35.6	12.1	57.6	0	3	7	30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
H	Segment	7.3	0	3.6	24.1	5.1	46.9	8.7	71	0	0	1	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
J	Segment	5.2	0	0.4	10.8	5.4	39.5	5.9	50.3	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
K	Segment	5.4	0	3.9	24.5	5.5	45.4	9.4	69.9	0	0	1	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
L	Segment	6.4	0	0.9	7.4	4.9	35.5	5.9	42.9	0	0	8	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
M	Segment	6.4	0	0.9	7.4	3.2	21.3	4.2	28.7	0	0	15	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Equivalent	5.2	0	0.4	5.9	8.8	57.6	9.3	63.5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
I	Segment	0.7	0	0	0	0.4	2.6	0.4	2.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Equivalent	0.6	0	0	0	0.5	5.2	0.5	5.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
N	Segment	3.2	0	0	0	0	0	0	0	0	1	4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Equivalent	2.6	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
O	Segment	5.1	1	0	0	4.2	29.0	4.2	29	0	0	4	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Green Equivalent	Equivalent	4.8	1	0	0	3.7	21.9	3.7	21.9	0	0	0	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
P	Segment	8.7	0	0	0	3.0	24.6	3	24.6	0	0	15	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Blue Equivalent	Equivalent	8.3	0	0	0	0.3	6.9	0.3	6.9	0	0	2	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Q	Segment	4.8	1	2.9	25.0	6.4	37.6	9.3	62.6	0	0	6	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Red/Blue Equivalent	Equivalent	5.1	0	1.6	14.6	2.6	23.7	4.2	38.3	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
R	Segment	5.8	1	2.9	25.0	10.8	72.3	13.7	97.3	2	5	6	15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Red Equivalent	Equivalent	6.1	0	1.6	14.6	2.6	23.7	4.2	38.3	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Y	Segment	2.9	1	3.3	43.4	7.8	65.6	11.1	109	0	2	5	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Red Equivalent	Equivalent	3.0	0	2.8	22.7	1.9	25.0	4.7	47.7	0	6	22	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AA1	Alignment	0.6	0	0	0	0	0	0	0	0	7	9	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0	0	0	3	14	7	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
AA2	Alignment	0.6	0	0	0	3.2	14.4	3.2	14.4	0	0	1	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Blue Equivalent	Alignment Equivalent	0.5	0	0	0.8	1.6	9.4	1.6	10.2	0	0	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AA3-a	Alignment	1.1	0	0	1.3	0	3.3	0	4.6	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
AA3-b	Alignment	1.1	0	0	2.0	0	3.1	0	5.1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Appendix J

Analysis Data for Routes, Route Segments and Alignment Alternatives

			Public Water Inventory Basins			Public Water Inventory Streams			Right-of-way Type (Road; Rail; Transmission Line; Road and Transmission Line; Road and Rail; Transmission Line and Rail; Road, Transmission Line, or Rail; Field, Section, or Parcel Line)																Scenic Byways			Schools/Daycares				Snowmobile Trails			
			Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Road		Railroad		Transmission Line		Road and Transmission Line		Road and Rail		Transmission Line and Rail		Road, Transmission Line, or Rail		Field, Section or Parcel Line		Crossing	Within 75 ft	Within 500 ft	Within 75 ft	Within 200 ft	Within 500 ft	Within 1000 ft	Crossing	Within 75 ft	Within 500 ft	
Route ID	Type	Length (mi)	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)	Total (mi)	Percent	Total (mi)	Percent	Total (mi)	Percent	Total (mi)	Percent	Total (mi)	Percent	Total (mi)	Percent	Total (mi)	Percent	Total (mi)	Percent	Count	Length (ft)	Length (ft)	Count	Count	Count	Count	Count	Length (ft)	Length (ft)	
Purple	Route	51.6	0	0	0	17	4769.3	31730.2	11.8	23	0.0	0	24.5	47	2.4	5	0.0	0	0.0	0	33.9	65.7	33.2	64	2	384.1	2502.0	0	0	0	0	3	450	3,115	
Green	Route	45.3	0	0	0.25	7	1285.1	11649.9	13.8	30	0.0	0	5.4	12	1.5	3	0.0	0	0.0	0	17.7	39.1	36.9	81	2	2224.2	5072.0	0	0	0	0	2	2,815	4,637	
Red	Route	46.5	1	1.90	36.33	12	2232.3	25142.9	11.3	24	0.0	0	26.3	57	3.8	8	0.0	0	0.0	0	33.9	72.9	36.5	78	2	2224.2	5072.0	0	0	0	0	6	16,817	22,071	
Blue	Route	57.1	0	0.28	13.97	15	3400.6	21544.1	7.8	14	2.6	5	9.7	17	0.0	0	0.3	1	0.5	1	19.2	33.6	47.2	83	1	171.3	1141.9	0	0	0	0	7	9,162	16,336	
Purple-E-Red	Route	54.1	1	1.90	36.33	14	2640.7	27859.6	12.9	24	0.0	0	32.3	60	3.8	7	0.0	0	0.0	0	41.4	76.6	51.3	95	2	384.1	2502.0	0	0	0	0	6	16,817	22,071	
A	Segment	3.8	0	0	0	0	0	0	0.0	0	0.0	0	0.8	21.1	0.0	0	0.0	0	0.0	0	0.7	19.7	2.7	71.1	1	152.2	1026.5	0	0	0	0	0	0	0	
B	Segment	2.9	0	0	0	0	0	0	1.1	37.9	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	1.1	36.8	1.8	62.1	3	2446.1	6390.5	0	0	0	0	0	0	0	
Red/Green Equivalent	Segment	3.0	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	2.8	93.3	1	152.2	1026.5	0	0	0	0	0	0	0	
D	Segment	2.0	0	0	0	1	181.3	1309.3	1.0	50	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	1.0	49.5	2.0	100	0	0	0	0	0	0	0	0	0		
E	Segment	18.4	0	0	0	4	711.9	4746.7	5.1	27.8	0.0	0	6.7	36.3	0.0	0	0.0	0	0.0	0	11.8	64.1	12.4	67.3	2	384.1	2502.0	0	0	0	0	0	0	0	
E2	Segment	18.3	0	0	0	4	711.9	4746.7	6.8	37.2	0.0	0	6.7	36.5	0.0	0	0.0	0	0.0	0	13.5	73.8	12.0	65.4	2	384.1	2502.0	0	0	0	0	0	0	0	
Red/Green Equivalent	Segment	10.8	0	0	0	2	303.5	2030.1	3.5	32.5	0.0	0	0.8	7.1	0.0	0	0.0	0	0.0	0	4.3	39.7	7.4	68.3	2	2224.2	5072.0	0	0	0	0	0	0	0	
F	Segment	3.8	0	0	0	1	151.0	1005.6	1.9	50	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	1.9	51.1	3.3	86.6	1	2667.7	5401.0	0	0	0	0	0	0	0	
Purple Equivalent	Segment	2.7	0	0	0	1	231.1	1005.6	0.0	0	0.0	0	2.7	100	0.0	0	0.0	0	0.0	0	2.7	100	0.0	0	2	384.1	2502.0	0	0	0	0	0	0	0	
G	Segment	3.4	0	0	0	0	0	0	3.4	100	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	3.4	100	3.4	100	0	0	0	0	0	0	0	0	0		
Blue Equivalent	Segment	2.9	0	0	0	1	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	1.3	45.4	0	0	0	0	0	0	0	0	0		
H	Segment	7.3	0	0	0	2	330.3	3574.0	2.4	33	0.0	0	2.5	34.3	0.0	0	0.0	0	0.0	0	4.9	67.2	4.5	61.8	0	0	0	0	0	0	0	3	4,651	10,029	
J	Segment	5.2	0	0	0	1	150.6	1030.1	1.4	27.2	0.0	0	1.0	19.4	0.0	0	0.0	0	0.0	0	2.4	46.6	2.7	54.3	0	0	0	0	0	0	0	2	302	1,281	
K	Segment	5.4	0	0	0	2	330.3	3574.0	2.7	50.4	0.0	0	1.0	18.7	0.0	0	0.0	0	0.0	0	3.7	69.4	4.0	74.7	0	0	0	0	0	0	0	2	489	4,459	
L	Segment	6.4	0	0	0	1	218.1	3639.5	3.7	58	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	3.7	58.2	5.9	92.5	0	0	0	0	0	0	0	0	0	0	
M	Segment	6.4	0	0	0	1	218.1	3639.5	3.0	46.9	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	3.0	47.5	5.8	90.7	0	0	0	0	0	1	0	0	0	0	
Purple Equivalent	Segment	5.2	0	0	0	1	150.5	1749.6	1.3	24.9	0.0	0	1.0	19.1	0.0	0	0.0	0	0.0	0	2.3	43.6	3.4	65.0	0	0	0	0	0	0	0	0	0	0	
I	Segment	0.7	0	0	0	0	0	0	0.7	100	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.7	100	0.7	100	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Segment	0.6	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.2	38.7	0	0	0	0	0	0	0	0	0	0	
N	Segment	3.2	0	0	0	2	6075.0	10412.6	2.2	68.5	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	2.2	69.8	3.2	100	0	0	0	0	0	0	0	0	0	0	0
Purple Equivalent	Segment	2.6	0	0	0	0	0	1540.5	0.5	19.4	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.5	19.9	2.3	89.4	0	0	0	0	0	0	0	0	0	0	0
O	Segment	5.1	0	0	0	1	152.7	2636.7	4.6	90.4	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	4.6	89.7	5.1	100	0	0	0	0	0	0	0	0	0	0	0
Green Equivalent	Segment	4.8	0	0	0	1	212.8	1338.3	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	4.1	85.8	0	0	0	0	0	0	0	0	0	0	0
P	Segment	8.7	0	0	0	1	156.4	1579.4	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	8.7	100	0	0	0	0	0	0	0	1	150	1,000	
Blue Equivalent	Segment	8.3	0	0	0	2	322.8	2586.1	0.0	0	0.0	0	1.2	14.5	0.0	0	0.0	0	0.0	0	1.2	15.1	5.5	66.6	0	0	0	0	0	0	0	1	150	1,000	
Q	Segment	4.8	0	0	0	1	153.9	1044.2	0.0	0	0.0	0	4.7	97.3	0.0	0	0.0	0	0.0	0	4.7	96.9	3.6	74.5	0	0	0	0	0	0	0	0	1,867	2,733	
Red/Blue Equivalent	Segment	5.1	0	0	0	1	293.8	1489.6	2.0	39.5	0.0	0	0.1	2.0	0.0	0	0.0	0	0.0	0	2.1	41.6	3.5	69.1	0	0	0	0	0	0	0	1	8,267	9,120	
R	Segment	5.8	0	0	0	1	153.9	1044.2	0.0	0	0.0	0	4.7	80.0	0.0	0	0.0	0	0.0	0	4.7	80.3	4.6	78.7	0	0	0	0	0	0	0	0	169	1,021	
Red Equivalent	Segment	6.1	0	0	0	1	293.8	1489.6	2.0	33	0.0	0	0.1	1.7	0.0	0	0.0	0	0.0	0	2.1	34.8	4.5	74.3	0	0	0	0	0	0	0	1	11,136	13,708	
Y	Segment	2.9	1	2.98	28.46	6	806.2	11333.0	0.0	0	0.0	0	2.9	100	0.0	0	0.0	0	0.0	0	2.9	100	0.9	30.8	0	0	0	0	0	0	0	0	0	0	
Red Equivalent	Segment	3.0	0	0	8.16	2	432.2	3804.3	1.8	60.7	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	1.8	61.9	2.6	87.7	0	0	0	0	0	0	0	0	0	0	
AA1	Alignment	0.6	0	0	0	0	0	0	0.6	100	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.6	100	0.6	100	0	0	0	0	0	0	0	0	0	0	
Segment E Purple Equivalent	Alignment	0.6	0	0	0	0	0	0	0.6	100	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.6	100	0.6	100	0	0	0	0	0	0	0	0	0	0	
AA2	Alignment	0.6	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.2	33.8	0	0	0	0	0	0	0	0	0	0	
Blue Equivalent	Alignment	0.5	0	0	0	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0	0	0	0	0	0	0	0	0	0	
AA3-a	Alignment	1.1	0	0	0	0	0	0	1.1	100	0.0	0	1.1	100	1.1	100	0.0	0	0.0	0	1.1	100	1.1	100	0	0	0	0	0	0	0	0	0	0	
AA3-b	Alignment	1.1	0	0	0	0	0	425.4	1.1	100	0.0	0	1.1	100	1.1	100	0.0	0	0.0	0	1.1	100	1.1	100	0	0	0	0	0	0	0	0	0	0	
Purple Equivalent	Alignment	1.1	0	0	0	0	0	0	1.1	100	0.0	0	1.1	100	1.1	100	0.0	0	0.0	0	1.1	100	1.1	100	0	0	0	0	0	0	0	0	0	0	

												United States Department of Agriculture Natural Resource Conservation Service Prime Farmland by Type										United States Fish and Wildlife Service Grassland Bird Conservation Area			United States Fish and Wildlife Service Wildlife Refuge		
												All areas are prime farmland		Farmland of statewide importance		Prime farmland if drained		Prime farmland if protected from flooding or not frequently flooded during the growing season		Prime farmland if drained and either protected or not frequently flooded during the growing season							
												Crossing	Within 75 ft	Within 500 ft	Crossing	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 1 mi	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft
Route ID	Type	Length (mi)	Count	Area (ac)	Area (ac)	Count	Length (ft)	Length (ft)	Count	Count	Count	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Count	Area (ac)	Area (ac)	Count	Area (ac)	Area (ac)
Purple	Route	51.6	0	0	0	0	0	0	0	0	1	248.8	1727.2	117.8	750.0	450.0	2954.3	11.1	90.4	3.1	20.4	2	80.6	537.6	0	0	0
Green	Route	45.3	0	0	0	0	0	0	0	0	0	201.9	1496.0	71.9	462.8	456.2	2897.2	1.6	8.2	2.3	17.0	2	106.5	705.3	0	0	0
Red	Route	46.5	0	0	0	0	0	0	0	0	0	255.2	1740.3	55.3	378.0	434.6	2789.9	5.1	51.6	2.3	17.0	2	106.5	705.3	0	0	0
Blue	Route	57.1	0	0	0	0	0	0	0	0	4	270.4	1890.1	78.5	555.2	621.5	4011.2	11.8	73.7	0	0	2	92.4	614.8	0	0	0
Purple-E-Red	Route	54.1	0	0	0	0	0	0	0	0	0	301.6	2072.1	57.6	425.7	495.9	3168.8	11.1	94.4	3.1	20.4	2	107.6	721.9	0	0	0
A	Segment	3.8	0	0	0	0	0	0	0	0	0	22.3	156.7	1.1	15.4	40.0	261.2	0	42.8	0	0	1	22.2	152.8	0	0	0
B	Segment	2.9	0	0	0	0	0	0	0	0	0	8.2	71.8	0.8	13.9	41.7	263.5	0	26.9	0	0	1	11.5	84.9	0	0	0
Red/Green Equivalent	Segment Equivalent	3.0	0	0	0	0	0	0	0	0	0	13.3	103.4	0.7	14.1	30.1	195.3	0	42.8	0	0	1	13.1	94.5	0	0	0
D	Segment	2.0	0	0	0	0	0	0	0	0	0	7.1	41.1	3.0	25.0	24.8	180.5	0	4.9	0	0	0	0	0	0	0	0
E	Segment	18.4	0	0	0	0	0	0	0	0	0	99.0	707.1	30.6	218.1	133.2	862.5	6.0	2.2	1.2	6.7	2	84.1	565.1	0	0	0
E2	Segment	18.3	0	0	0	0	0	0	0	0	0	103.2	681.5	32.5	213.3	127.9	878.8	6.0	11.7	1.2	6.7	2	84.1	565.1	0	0	0
Red/Green Equivalent	Segment Equivalent	10.8	0	0	0	0	0	0	0	0	0	52.7	376.3	28.3	170.5	71.9	485.2	0	11.7	0.4	3.3	2	83.0	548.5	0	0	0
F	Segment	3.8	0	0	0	0	0	0	0	0	0	13.8	106.0	2.5	21.7	1.0	19.7	0	14.3	0.6	3.6	1	69.7	478.9	0	0	0
Purple Equivalent	Segment Equivalent	2.7	0	0	0	0	0	0	0	0	0	5.1	47.2	5.0	36.0	5.7	33.9	3.3	0.1	1.2	6.7	2	50.3	350.8	0	0	0
G	Segment	3.4	0	0	0	0	0	0	0	0	0	11.9	100.4	6.1	49.1	42.9	265.5	0	14.3	0	0	0	0	0	0	0	0
Blue Equivalent	Segment Equivalent	2.9	0	0	0	0	0	0	0	0	0	7.8	55.4	7.6	43.1	34.9	255.6	0	0.07	0	0	0	0	0	0	0	0
H	Segment	7.3	0	0	0	0	0	0	0	0	0	33.4	224.0	30.9	203.5	48.8	328.4	1.8	7.3	0	0	0	0	0	0	0	0
J	Segment	5.2	0	0	0	0	0	0	0	0	0	9.3	65.7	48.0	288.3	30.4	224.5	0.5	7.2	0	0	0	0	0	0	0	0
K	Segment	5.4	0	0	0	0	0	0	0	0	0	19.9	138.8	25.6	164.6	36.5	252.9	1.8	5.5	0	0	0	0	0	0	0	0
L	Segment	6.4	0	0	0	0	0	0	0	0	0	11.7	74.8	33.8	241.5	47.2	316.4	0	3.9	0	0	0	0	0	0	0	0
M	Segment	6.4	0	0	0	0	0	0	0	0	0	11.3	84.8	42.4	289.5	46.9	321.4	0	0	0	0	0	0	0	0	0	0
Purple Equivalent	Segment Equivalent	5.2	0	0	0	0	0	0	0	0	0	10.1	57.9	45.9	274.1	23.3	196.4	0	15.8	0	0	0	0	0	0	0	0
I	Segment	0.7	0	0	0	0	0	0	0	0	0	0.0	2.7	4.1	35.4	9.5	67.2	0	0	0	0	0	0	0	0	0	0
Purple Equivalent	Segment Equivalent	0.6	0	0	0	0	0	0	0	0	0	0.0	3.9	4.7	30.4	6.6	55.6	0	0	0	0	0	0	0	0	0	0
N	Segment	3.2	0	0	0	0	0	0	0	0	1	9.8	117.7	4.8	40.5	41.6	226.3	0	0	0	0	0	0	0	0	0	0
Purple Equivalent	Segment Equivalent	2.6	0	0	0	0	0	0	0	0	1	17.2	132.2	0.0	42.8	29.9	195.3	0	0	0	0	0	0	0	0	0	0
O	Segment	5.1	0	0	0	0	0	0	0	0	0	27.8	234.0	14.0	92.2	47.6	275.8	0	0	0	0	0	0	0	0	0	0
Green Equivalent	Segment Equivalent	4.8	0	0	0	0	0	0	0	0	0	31.9	259.6	7.5	80.1	44.0	265.8	0	0	0	0	0	0	0	0	0	0
P	Segment	8.7	0	0	0	0	0	0	0	0	0	46.3	352.6	9.9	20.2	102.9	660.1	0	0	0	0	1	3.8	33.0	0	0	0
Blue Equivalent	Segment Equivalent	8.3	0	0	0	0	0	0	0	0	0	53.4	384.8	13.5	55.9	82.7	533.8	0	0	0	0	1	6.1	48.5	0	0	0
Q	Segment	4.8	0	0	0	0	0	0	0	0	0	36.5	279.1	11.6	30.6	26.4	153.7	1.9	0	0	0	0	0	0	0	0	0
Red/Blue Equivalent	Segment Equivalent	5.1	0	0	0	0	0	0	0	0	0	45.5	320.2	1.9	64.5	36.8	234.8	0	0	0	0	0	0	0	0	0	0
R	Segment	5.8	0	0	0	0	0	0	0	0	0	43.9	332.4	11.2	8.5	39.5	234.8	1.9	0	0	0	0	0	0	0	0	0
Red Equivalent	Segment Equivalent	6.1	0	0	0	0	0	0	0	0	0	57.0	399.8	3.5	61.0	41.8	265.9	0	0	0	0	0	0	0	0	0	0
Y	Segment	2.9	0	0	0	0	0	0	0	0	0	26.3	158.2	6.0	27.3	9.3	77.6	1.1	0	0	0	0	0	0	0	0	0
Red Equivalent	Segment Equivalent	3.0	0	0	0	0	0	0	0	0	0	28.6	180.0	0.9	26.6	19.8	140.8	2.0	0	0	0	0	0	0	0	0	0
AA1	Alignment	0.6	0	0	0	0	0	0	0	0	0	5.6	46.8	0	0	2.4	21.3	0	0	0	0	1	9.9	68.3	0	0	0
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0	0	0	0	4.3	45.9	0	33.2	0.5	14.2	0	0	0	0	1	10.6	77.8	0	0	0
AA2	Alignment	0.6	0	0	0	0	0	0	0	0	0	3.3	24.6	6.1	0	1.8	30.0	0	0	0	0	0	0	0	0	0	0
Blue Equivalent	Alignment Equivalent	0.5	0	0	0	0	0	0	0	0	0	1.5	17.3	3.9	0	3.8	31.5	0	0	0	0	0	0	0	0	0	0
AA3-a	Alignment	1.1	0	0	0	0	0	0	0	0	0	15.9	104.2	0	0	3.2	19.6	0	5.5	0	0	0	0	0	0	0	0
AA3-b	Alignment	1.1	0	0	0	0	0	0	0	0	0	16.7	106.2	0	0	3.5	19.8	0	4.0	0	0	0	0	0	0	0	0
Purple Equivalent	Alignment Equivalent	1.1	0	0	0	0	0	0	0	0	0	14.1	102.1	0	0	2.3	18.8	0.63	7.2	0	0	0	0	0	0	0	0

			United States Fish and Wildlife Service Waterfowl Production Areas			University of Minnesota Landcover																			
						Conifer Forest		Deciduous Forest		Developed		Emergent Wetland		Forested and Shrub Wetland		Hay and Pasture		Managed Grass/Natural Grass		Mixed Forest		Open Water		Row Crops	
			Crossing	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft	Within 75 ft	Within 500 ft
Route ID	Type	Length (mi)	Count	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)	Area (ac)
Purple	Route	51.6	1	9.0	95.1	0	0	26.6	199.4	93.8	448.4	47.9	267.1	10.5	88.1	0	6.4	142.2	815.6	0.3	0.8	5.6	43.2	611.5	4383.7
Green	Route	45.3	0	0	0	0	0	56.7	401.5	141.0	540.0	32.2	211.4	8.3	73.4	2.6	32.2	57.3	394.4	0.5	5.5	6.2	39.3	519.5	3792.9
Red	Route	46.5	1	9.1	76.0	0	0	49.0	367.2	143.4	498.2	40.3	251.4	14.9	140.8	1.0	27.1	81.4	492.0	0.2	7.3	8.6	86.6	506.4	3764.2
Blue	Route	57.1	0	0.6	57.1	0	0	14.1	125.5	109.4	409.8	30.4	220.3	23.1	121.8	0.9	16.7	99.6	604.6	0.2	3.3	5.2	38.1	754.5	5374.5
Purple-E-Red	Route	54.1	1	9.1	76.0	0.0	0.7	37.4	320.0	150.5	527.4	51.1	297.1	15.3	140.4	7.5	53.4	92.0	563.1	0.3	7.6	9.9	99.9	619.4	4549.4
A	Segment	3.8	0	0	0	0	0	4.9	46.9	4.8	31.9	1.1	3.8	0.7	6.7	0.8	3.7	5.0	23.7	0	0	0	0	52.2	359.8
B	Segment	2.9	0	0	0	0	0	0.1	12.5	14.7	54.4	0.6	6.4	0.5	2.9	0	0	5.7	30.0	0	0	0.5	1.2	30.5	257.9
Red/Green Equivalent	Segment Equivalent	3.0	0	0	0	0	0	9.1	66.3	1.9	21.8	0.4	4.8	1.2	17.0	0	0	5.9	24.2	0	0	0	0	35.9	242.5
D	Segment	2.0	0	0	0	0	0	0.3	4.9	12.1	29.1	2.3	14.6	0	1.2	0	0	5.6	20.6	0	0	0.3	2.7	16.1	186.3
E	Segment	18.4	0	0	0	0.0	0.7	18.2	162.9	50.4	242.2	20.1	103.2	4.0	30.2	7.4	46.4	31.7	194.4	0.1	0.3	3.2	25.0	200.3	1441.1
E2	Segment	18.3	0	0	0	0.0	0.7	14.6	158.5	63.8	260.1	22.9	114.4	4.0	30.2	0.5	10.8	29.2	187.3	0	0.3	3.2	25.0	194.7	1442.8
Red/Green Equivalent	Segment Equivalent	10.8	0	0	0	0	0	29.8	210.1	43.3	213.0	9.2	57.4	3.6	30.5	1.0	20.1	21.1	123.3	0	0	1.8	11.7	87.4	658.4
F	Segment	3.8	0	0	0	0	0	1.8	32.7	24.2	67.7	3.2	23.0	0.4	8.5	0	0	6.6	49.5	0	0	1.1	9.5	32.4	288.6
Purple Equivalent	Segment Equivalent	2.7	0	0	0	0	0	1.6	20.5	2.2	17.9	9.2	47.7	2.3	22.1	0	0	15.3	86.9	0	0	2.0	12.4	17.7	143.3
G	Segment	3.4	0	0	0	0	0	0.3	21.0	28.5	83.2	4.3	16.7	1.4	18.9	0.3	5.6	1.4	49.5	0	0	0	0	25.3	227.7
Blue Equivalent	Segment Equivalent	2.9	0	0	0	0	0	0.6	6.6	2.3	16.0	2.8	30.8	9.5	29.5	0	1.4	2.8	30.7	0	0	0	0.2	34.4	249.8
H	Segment	7.3	1	9.0	60.5	0	0	2.0	19.2	12.8	70.8	4.8	43.2	3.7	24.5	0.8	2.1	20.7	117.7	0.3	1.4	0.8	6.8	86.9	611.0
J	Segment	5.2	1	9.0	63.2	0	0	1.3	16.3	7.8	49.0	5.7	39.0	0.6	11.7	0	0	18.8	121.8	0	0	0.5	3.6	59.4	399.0
K	Segment	5.4	1	9.0	63.2	0	0	2.0	18.1	13.4	72.6	5.5	41.6	4.1	24.7	0.8	2.1	20.7	109.7	0.3	1.4	0.8	7.1	50.3	388.2
L	Segment	6.4	0	0	0	0	0	3.4	31.0	16.4	100.4	4.7	33.6	0.9	8.2	0	0	10.3	73.5	0	0	1.1	4.9	79.4	533.8
M	Segment	6.4	0	0	0	0	0	9.2	38.6	10.5	90.1	2.4	18.3	0.9	7.6	0	0	12.0	71.9	0	0	1.1	4.9	80.5	558.5
Purple Equivalent	Segment Equivalent	5.2	1	9.0	95.1	0	0	1.4	15.0	9.8	46.3	8.7	52.2	1.5	11.3	0	0.0	19.3	125.5	0	0	0.4	5.5	54.4	393.1
I	Segment	0.7	0	0	25.8	0	0	0	0	3.4	22.4	0.5	3.2	0	0	0	0	0.0	24.8	0	0	0	0	9.7	54.8
Purple Equivalent	Segment Equivalent	0.6	0	0	3.0	0	0	0	0	1.1	12.2	0.6	5.7	0	0	0	0	0.4	9.7	0	0	0	0	9.2	62.3
N	Segment	3.2	0	0	0	0	0	0	3.7	20.0	65.1	0	0	0	0	0	4.0	18.5	120.7	0	0	0	0	20.2	212.3
Purple Equivalent	Segment Equivalent	2.6	0	0	0	0	0	0	0	4.3	24.0	0	0	0	0	0	0	34.9	186.3	0	0	0	0	8.0	117.2
O	Segment	5.1	0	0	0.3	0	0	0.4	14.4	40.3	107.7	4.2	27.6	0	0.4	0	1.0	12.0	115.5	0	0	0	2.1	36.0	364.7
Green Equivalent	Segment Equivalent	4.8	0	0	0	0	0	0	2.7	2.9	22.1	1.6	14.1	0	0	0	1.5	5.4	27.5	0	0.2	2.2	8.1	75.2	520.9
P	Segment	8.7	0	0	0	0	0	7.1	21.6	19.1	56.4	3.0	24.1	0	0	0	7.0	15.9	84.9	0	1.9	0.2	2.3	113.9	872.6
Blue Equivalent	Segment Equivalent	8.3	0	0	0	0	0	0	1.8	4.5	28.6	0.3	6.7	0	0	0.7	5.0	13.1	86.1	0	0	0.2	1.9	131.8	887.8
Q	Segment	4.8	1	5.7	33.2	0	0	3.0	27.6	2.4	14.6	6.3	30.1	2.9	27.3	1.2	7.1	23.9	135.8	0	0.2	1.0	9.7	47.7	350.8
Red/Blue Equivalent	Segment Equivalent	5.1	0	0	14.2	0	0	3.0	22.3	22.9	51.7	1.9	14.5	1.7	19.6	0	0	19.2	138.2	0.2	3.0	1.2	6.7	42.3	373.1
R	Segment	5.8	0	0	0	0	0	4.7	38.7	2.7	17.9	8.6	55.9	2.9	27.3	1.2	4.7	20.5	113.0	0	0.2	2.8	18.2	63.2	447.4
Red Equivalent	Segment Equivalent	6.1	0	0	14.2	0	0	3.0	22.3	23.4	55.0	1.9	14.5	1.7	19.6	0	0	19.4	139.5	0.2	3.0	1.2	6.7	59.8	489.4
Y	Segment	2.9	0	0	0	0	0	4.8	27.3	1.9	11.4	6.5	46.0	4.4	48.0	2.2	4.0	2.7	24.2	0	0.6	1.1	18.3	30.1	192.9
Red Equivalent	Segment Equivalent	3.0	0	0	0	0	0	1.2	15.2	21.4	42.3	1.5	20.6	3.0	25.4	0	4.0	1.8	15.4	0	4.3	0.5	5.1	25.0	245.1
AA1	Alignment	0.6	0	0	0	0	0	0	3.3	7.5	40.6	0	0	0	0	0	0	1.5	15.2	0	0	0	0	2.9	35.4
Segment E Purple Equivalent	Alignment Equivalent	0.6	0	0	0	0	0	0.5999	7.8	8.9	39.9	0	0	0	0	0	0	1.3	17.2	0	0	0	0	1.0	29.3
AA2	Alignment	0.6	0	0	0	0	0	0	0	0.6	4.2	3.1	14.8	0	0	0	0	0	2.3	0	0	0	0	7.4	68.3
Blue Equivalent	Alignment Equivalent	0.5	0	0	0	0	0	0	0.5	0.6	3.8	1.6	9.6	0	1.0	0	0	0	0	0	0	0	0	7.6	65.4
AA3-a	Alignment	1.1	0	0	0	0	0	0.7	7.9	8.5	18.1	0	3.4	0	2.0	0	0	3.8	33.8	0	0	0	0.1	7.0	83.3
AA3-b	Alignment	1.1	0	0	0	0	0	0	7.4	12.5	18.1	0	2.8	0	2.3	0	0	4.4	34.7	0	0	0	0.8	3.8	85.6
Purple Equivalent	Alignment Equivalent	1.1	0	0	0	0	0	2.4	8.8	0.2	18.1	0.2	4.3	0.2	3.6	0	0	5.8	32.7	0	0	0	0.1	11.2	79.9

Appendix K

Rare Species Documented within One Mile of Route Segments and Alignment Alternatives

Common Name ^a	Scientific Name	Habitat	Type	Status ^b		Route Segment A			Route Segment B			Red/Green Route Equivalent			Route Segment D			Route Segment E			Route Segment E2			Red/Green Route Equivalent			Route Segment F			Purple Route Equivalent		
						75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile
				State	Federal																											
Great Plains toad	<i>Anaxyrus cognatus</i>	Upland and lowland prairies.	Amphibian	SC	-																											
Smooth softshell	<i>Apalone mutica</i>	Large rivers with sandy substrates.	Reptile	SC	-																				x							
Green dragon	<i>Arisaema dracontium</i>	Floodplain forests, wet forests.	Vascular plant	SC																												
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	Restricted to native, moist prairies in southern Minnesota.	Vascular plant	THR	-														x			x					x	x			x	
Sullivant's milkweed	<i>Asclepias sullivantii</i>	Mesic tallgrass prairies.	Vascular plant	THR	-														x			x					x	x			x	
Upland sandpiper	<i>Bartramia longicauda</i>	Native prairies and grasslands.	Bird	WL	-			x			x			x					x			x			x							
Stream parsnip	<i>Berula erecta</i>	Swamps, seeps, shallow water, and cool streams.	Vascular plant	THR	-																											
Lark sparrow	<i>Chondestes grammacus</i>	Upland prairies, savannas, fire dependent forests, rock outcrops.	Bird	SC	-			x																								
North American racer	<i>Coluber constrictor</i>	Forested hillsides, bluff prairies, grasslands, and open woods.	Reptile	SC	-																											
Trumpeter swan	<i>Cygnus buccinator</i>	Marshes and littoral zone of lakes.	Bird	SC	-																											
Small white lady s slipper	<i>Cypripedium candidum</i>	Deep-soil mesic prairies, wet prairies, calcareous fens.	Vascular plant	SC	-														x			x						x			x	
Goldie s fern	<i>Dryopteris goldiana</i>	Mesic hardwood forests.	Vascular plant	SC	-													x	x	x	x	x	x			x						
Blanding's turtle	<i>Emydoidea blandingii</i>	Requires calm, shallow waters with rich, aquatic vegetation for foraging and adjacent sandy uplands for nesting.	Reptile	THR	-																											
Rattlesnake master	<i>Eryngium yuccifolium</i>	Upland prairies.	Vascular plant	SC	-												x	x	x	x	x	x	x					x	x	x	x	
Kentucky coffee tree	<i>Gymnocladus dioica</i>	Mesic hardwood forests.	Vascular plant	SC	-										x										x							
Bald eagle	<i>Haliaeetus leucocephalus</i>	Lakes and rivers in forested areas where tall, large diameter trees are available for nesting.	Bird	WL	-												x	x	x	x	x	x	x			x			x	x	x	x
Rock fir moss	<i>Hyperzia porophila</i>	Moist, well-shaded wooded habitats.	Vascular plant	THR	-												x	x	x	x	x	x	x			x						
Milksnake	<i>Lampropeltis triangulum</i>	Deciduous forests, woodlots, savannas, pastures, and prairies.	Reptile	WL	-														x			x	x	x	x							
Loggerhead shrike	<i>Lanius ludovicianus</i>	Upland prairie habitats; native and non-native grassland; sometimes in agricultural areas.	Bird	END															x			x						x			x	
Bullfrog	<i>Lithobates catesbeianus</i>	Wetlands, lakes, ponds, streams, backwaters of rivers.	Amphibian	WL	-														x													
Western foxsnake	<i>Pantherophis ramspotti</i>	Agricultural fields and farms, grasslands, and riparian woodlands.	Reptile	WL	-		x	x			x		x	x					x			x	x	x	x	x	x	x			x	
Louisiana waterthrush	<i>Parkesia motacilla</i>	Mature riparian forests.	Bird	SC	-														x			x				x						
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Upland prairies.	Mammal	SC	-			x			x			x												x						
Hair-like beak rush	<i>Rhynchospora capillacea</i>	Calcareous fens.	Vascular plant	THR	-																											
Three-leaved coneflower	<i>Rudbeckia triloba</i> var. <i>triloba</i>	Mesic floodplain forests and hardwood forests.	Vascular plant	THR	-			x			x			x										x	x	x						
Eastern spotted skunk	<i>Spilogale putorius</i>	Open lands with adequate cover, (e.g., fencerows, shelterbelts, thickets, brush, riparian woodlands).	Mammal	THR	-																											
Snow trillium	<i>Trillium nivale</i>	Mesic hardwood forests, floodplain forests.	Vascular plant	SC	-														x	x			x			x						
Bell s vireo	<i>Vireo bellii</i>	Wet meadow/carr wetlands, upland and lowland prairies.	Bird	SC	-			x			x			x					x			x			x							

^a Aquatic species listed in Table 5-10 have been removed from this table since impacts are not anticipated
^b END – Endangered; THR – Threatened; SC - Special Concern; WL - Watchlist

Appendix K
Rare Species Documented within One Mile of Route Segments and Alignment Alternatives

Common Name ^a	Scientific Name	Habitat	Type	Status ^b		Route Segment G			Blue Route Equivalent			Route Segment H			Route Segment J			Route Segment K			Route Segment L			Route Segment M			Purple Route Equivalent			Route Segment I		
						75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile
				State	Federal																											
Great Plains toad	<i>Anaxyrus cognatus</i>	Upland and lowland prairies.	Amphibian	SC	-									x			x			x			x			x			x	x	x	x
Smooth softshell	<i>Apalone mutica</i>	Large rivers with sandy substrates.	Reptile	SC	-																	x										
Green dragon	<i>Arisaema dracontium</i>	Floodplain forests, wet forests.	Vascular plant	SC																												
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	Restricted to native, moist prairies in southern Minnesota.	Vascular plant	THR	-																											
Sullivant's milkweed	<i>Asclepias sullivantii</i>	Mesic tallgrass prairies.	Vascular plant	THR	-																											
Upland sandpiper	<i>Bartramia longicauda</i>	Native prairies and grasslands.	Bird	WL	-																											
Stream parsnip	<i>Berula erecta</i>	Swamps, seeps, shallow water, and cool streams.	Vascular plant	THR	-																											
Lark sparrow	<i>Chondestes grammacus</i>	Upland prairies, savannas, fire dependent forests, rock outcrops.	Bird	SC	-																											
North American racer	<i>Coluber constrictor</i>	Forested hillsides, bluff prairies, grasslands, and open woods.	Reptile	SC	-																											
Trumpeter swan	<i>Cygnus buccinator</i>	Marshes and littoral zone of lakes.	Bird	SC	-																											
Small white lady s slipper	<i>Cypripedium candidum</i>	Deep-soil mesic prairies, wet prairies, calcareous fens.	Vascular plant	SC	-																											
Goldie s fern	<i>Dryopteris goldiana</i>	Mesic hardwood forests.	Vascular plant	SC	-																											
Blanding's turtle	<i>Emydoidea blandingii</i>	Requires calm, shallow waters with rich, aquatic vegetation for foraging and adjacent sandy uplands for nesting.	Reptile	THR	-																											
Rattlesnake master	<i>Eryngium yuccifolium</i>	Upland prairies.	Vascular plant	SC	-																											
Kentucky coffee tree	<i>Gymnocladus dioica</i>	Mesic hardwood forests.	Vascular plant	SC	-			x			x																					
Bald eagle	<i>Haliaeetus leucocephalus</i>	Lakes and rivers in forested areas where tall, large diameter trees are available for nesting.	Bird	WL	-																											
Rock fir moss	<i>Hyperzia porophila</i>	Moist, well-shaded wooded habitats.	Vascular plant	THR	-																											
Milksnake	<i>Lampropeltis triangulum</i>	Deciduous forests, woodlots, savannas, pastures, and prairies.	Reptile	WL	-																											
Loggerhead shrike	<i>Lanius ludovicianus</i>	Upland prairie habitats; native and non-native grassland; sometimes in agricultural areas.	Bird	END																												
Bullfrog	<i>Lithobates catesbeianus</i>	Wetlands, lakes, ponds, streams, backwaters of rivers.	Amphibian	WL	-																											
Western foxsnake	<i>Pantherophis ramspotti</i>	Agricultural fields and farms, grasslands, and riparian woodlands.	Reptile	WL	-																											
Louisiana waterthrush	<i>Parquesia motacilla</i>	Mature riparian forests.	Bird	SC	-																											
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Upland prairies.	Mammal	SC	-																											
Hair-like beak rush	<i>Rhynchospora capillacea</i>	Calcareous fens.	Vascular plant	THR	-																											
Three-leaved coneflower	<i>Rudbeckia triloba</i> var. <i>triloba</i>	Mesic floodplain forests and hardwood forests.	Vascular plant	THR	-																											
Eastern spotted skunk	<i>Spilogale putorius</i>	Open lands with adequate cover, (e.g., fencerows, shelterbelts, thickets, brush, riparian woodlands).	Mammal	THR	-									x	x	x	x			x	x	x	x	x	x	x	x	x	x			
Snow trillium	<i>Trillium nivale</i>	Mesic hardwood forests, floodplain forests.	Vascular plant	SC	-																											
Bell s vireo	<i>Vireo bellii</i>	Wet meadow/carr wetlands, upland and lowland prairies.	Bird	SC	-			x			x																					

^a Aquatic species listed in Table 5-10 have been removed from this table since impacts are not anticipated
^b END – Endangered; THR – Threatened; SC - Special Concern; WL - Watchlist

Common Name ^a	Scientific Name	Habitat	Type	Status ^b		Purple Route Equivalent			Route Segment N			Purple Route Equivalent			Route Segment O			Green Route Equivalent			Route Segment P			Blue Route Equivalent			Route Segment Q			Red/Blue Route Equivalent		
						75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile
				State	Federal																											
Great Plains toad	<i>Anaxyrus cognatus</i>	Upland and lowland prairies.	Amphibian	SC	-			x																								
Smooth softshell	<i>Apalone mutica</i>	Large rivers with sandy substrates.	Reptile	SC	-																											
Green dragon	<i>Arisaema dracontium</i>	Floodplain forests, wet forests.	Vascular plant	SC																							x			x		
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	Restricted to native, moist prairies in southern Minnesota.	Vascular plant	THR	-																											
Sullivant's milkweed	<i>Asclepias sullivantii</i>	Mesic tallgrass prairies.	Vascular plant	THR	-																		x	x	x							
Upland sandpiper	<i>Bartramia longicauda</i>	Native prairies and grasslands.	Bird	WL	-																											
Stream parsnip	<i>Berula erecta</i>	Swamps, seeps, shallow water, and cool streams.	Vascular plant	THR	-																											
Lark sparrow	<i>Chondestes grammacus</i>	Upland prairies, savannas, fire dependent forests, rock outcrops.	Bird	SC	-																											
North American racer	<i>Coluber constrictor</i>	Forested hillsides, bluff prairies, grasslands, and open woods.	Reptile	SC	-																											
Trumpeter swan	<i>Cygnus buccinator</i>	Marshes and littoral zone of lakes.	Bird	SC	-											x			x													
Small white lady s slipper	<i>Cypripedium candidum</i>	Deep-soil mesic prairies, wet prairies, calcareous fens.	Vascular plant	SC	-																											
Goldie s fern	<i>Dryopteris goldiana</i>	Mesic hardwood forests.	Vascular plant	SC	-																											
Blanding's turtle	<i>Emydoidea blandingii</i>	Requires calm, shallow waters with rich, aquatic vegetation for foraging and adjacent sandy uplands for nesting.	Reptile	THR	-																											
Rattlesnake master	<i>Eryngium yuccifolium</i>	Upland prairies.	Vascular plant	SC	-															x	x	x	x				x					
Kentucky coffee tree	<i>Gymnocladus dioica</i>	Mesic hardwood forests.	Vascular plant	SC	-																						x			x		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Lakes and rivers in forested areas where tall, large diameter trees are available for nesting.	Bird	WL	-																											
Rock fir moss	<i>Hyperzia porophila</i>	Moist, well-shaded wooded habitats.	Vascular plant	THR	-																											
Milksnake	<i>Lampropeltis triangulum</i>	Deciduous forests, woodlots, savannas, pastures, and prairies.	Reptile	WL	-																											
Loggerhead shrike	<i>Lanius ludovicianus</i>	Upland prairie habitats; native and non-native grassland; sometimes in agricultural areas.	Bird	END																												
Bullfrog	<i>Lithobates catesbeianus</i>	Wetlands, lakes, ponds, streams, backwaters of rivers.	Amphibian	WL	-																											
Western foxsnake	<i>Pantherophis ramspotti</i>	Agricultural fields and farms, grasslands, and riparian woodlands.	Reptile	WL	-																											
Louisiana waterthrush	<i>Parkesia motacilla</i>	Mature riparian forests.	Bird	SC	-																											
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Upland prairies.	Mammal	SC	-																											
Hair-like beak rush	<i>Rhynchospora capillacea</i>	Calcareous fens.	Vascular plant	THR	-																											
Three-leaved coneflower	<i>Rudbeckia triloba</i> var. <i>triloba</i>	Mesic floodplain forests and hardwood forests.	Vascular plant	THR	-																											
Eastern spotted skunk	<i>Spilogale putorius</i>	Open lands with adequate cover, (e.g., fencerows, shelterbelts, thickets, brush, riparian woodlands).	Mammal	THR	-																											
Snow trillium	<i>Trillium nivale</i>	Mesic hardwood forests, floodplain forests.	Vascular plant	SC	-																											
Bell s vireo	<i>Vireo bellii</i>	Wet meadow/carr wetlands, upland and lowland prairies.	Bird	SC	-																											

^a Aquatic species listed in Table 5-10 have been removed from this table since impacts are not anticipated
^b END – Endangered; THR – Threatened; SC - Special Concern; WL - Watchlist

Appendix K
Rare Species Documented within One Mile of Route Segments and Alignment Alternatives

Common Name ^a	Scientific Name	Habitat	Type	Status ^b		Route Segment R			Red Route Equivalent			Route Segment Y			Route Equivalent			Alignment Alternative 1			E Route Segment Alternative			Alignment Alternative 2			Blue Route Equivalent			Alignment Alternative 3		
						75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile	75 feet	500 feet	1 mile
				State	Federal																											
Great Plains toad	<i>Anaxyrus cognatus</i>	Upland and lowland prairies.	Amphibian	SC	-																											
Smooth softshell	<i>Apalone mutica</i>	Large rivers with sandy substrates.	Reptile	SC	-																											
Green dragon	<i>Arisaema dracontium</i>	Floodplain forests, wet forests.	Vascular plant	SC				x			x																			x		
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	Restricted to native, moist prairies in southern Minnesota.	Vascular plant	THR	-																											
Sullivant's milkweed	<i>Asclepias sullivantii</i>	Mesic tallgrass prairies.	Vascular plant	THR	-																											
Upland sandpiper	<i>Bartramia longicauda</i>	Native prairies and grasslands.	Bird	WL	-													x			x											
Stream parsnip	<i>Berula erecta</i>	Swamps, seeps, shallow water, and cool streams.	Vascular plant	THR	-																											
Lark sparrow	<i>Chondestes grammacus</i>	Upland prairies, savannas, fire dependent forests, rock outcrops.	Bird	SC	-																											
North American racer	<i>Coluber constrictor</i>	Forested hillsides, bluff prairies, grasslands, and open woods.	Reptile	SC	-																											
Trumpeter swan	<i>Cygnus buccinator</i>	Marshes and littoral zone of lakes.	Bird	SC	-								x				x															
Small white lady s slipper	<i>Cypripedium candidum</i>	Deep-soil mesic prairies, wet prairies, calcareous fens.	Vascular plant	SC	-																											
Goldie s fern	<i>Dryopteris goldiana</i>	Mesic hardwood forests.	Vascular plant	SC	-													x			x											
Blanding's turtle	<i>Emydoidea blandingii</i>	Requires calm, shallow waters with rich, aquatic vegetation for foraging and adjacent sandy uplands for nesting.	Reptile	THR	-																											
Rattlesnake master	<i>Eryngium yuccifolium</i>	Upland prairies.	Vascular plant	SC	-			x																								
Kentucky coffee tree	<i>Gymnocladus dioica</i>	Mesic hardwood forests.	Vascular plant	SC	-			x			x													x			x			x		
Bald eagle	<i>Haliaeetus leucocephalus</i>	Lakes and rivers in forested areas where tall, large diameter trees are available for nesting.	Bird	WL	-																											
Rock fir moss	<i>Huperzia porophila</i>	Moist, well-shaded wooded habitats.	Vascular plant	THR	-													x			x											
Milksnake	<i>Lampropeltis triangulum</i>	Deciduous forests, woodlots, savannas, pastures, and prairies.	Reptile	WL	-																											
Loggerhead shrike	<i>Lanius ludovicianus</i>	Upland prairie habitats; native and non-native grassland; sometimes in agricultural areas.	Bird	END																												
Bullfrog	<i>Lithobates catesbeianus</i>	Wetlands, lakes, ponds, streams, backwaters of rivers.	Amphibian	WL	-																											
Western foxsnake	<i>Pantherophis ramspotti</i>	Agricultural fields and farms, grasslands, and riparian woodlands.	Reptile	WL	-													x			x											
Louisiana waterthrush	<i>Parkesia motacilla</i>	Mature riparian forests.	Bird	SC	-													x			x											
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Upland prairies.	Mammal	SC	-																											
Hair-like beak rush	<i>Rhynchospora capillacea</i>	Calcareous fens.	Vascular plant	THR	-																											
Three-leaved coneflower	<i>Rudbeckia triloba</i> var. <i>triloba</i>	Mesic floodplain forests and hardwood forests.	Vascular plant	THR	-																											
Eastern spotted skunk	<i>Spilogale putorius</i>	Open lands with adequate cover, (e.g., fencerows, shelterbelts, thickets, brush, riparian woodlands).	Mammal	THR	-																											
Snow trillium	<i>Trillium nivale</i>	Mesic hardwood forests, floodplain forests.	Vascular plant	SC	-																											
Bell s vireo	<i>Vireo bellii</i>	Wet meadow/carr wetlands, upland and lowland prairies.	Bird	SC	-																											

^a Aquatic species listed in Table 5-10 have been removed from this table since impacts are not anticipated
^b END – Endangered; THR – Threatened; SC - Special Concern; WL - Watchlist

Common Name ^a	Scientific Name	Habitat	Type	Status ^b		Purple Route North Equivalent			Purple Route South Equivalent		
						75 feet	500 feet	1 mile	75 feet	500 feet	1 mile
				State	Federal						
Great Plains toad	<i>Anaxyrus cognatus</i>	Upland and lowland prairies.	Amphibian	SC	-						
Smooth softshell	<i>Apalone mutica</i>	Large rivers with sandy substrates.	Reptile	SC	-						
Green dragon	<i>Arisaema dracontium</i>	Floodplain forests, wet forests.	Vascular plant	SC				x			x
Tuberous Indian-plantain	<i>Arnoglossum plantagineum</i>	Restricted to native, moist prairies in southern Minnesota.	Vascular plant	THR	-						
Sullivant's milkweed	<i>Asclepias sullivantii</i>	Mesic tallgrass prairies.	Vascular plant	THR	-						
Upland sandpiper	<i>Bartramia longicauda</i>	Native prairies and grasslands.	Bird	WL	-						
Stream parsnip	<i>Berula erecta</i>	Swamps, seeps, shallow water, and cool streams.	Vascular plant	THR	-						
Lark sparrow	<i>Chondestes grammacus</i>	Upland prairies, savannas, fire dependent forests, rock outcrops.	Bird	SC	-						
North American racer	<i>Coluber constrictor</i>	Forested hillsides, bluff prairies, grasslands, and open woods.	Reptile	SC	-						
Trumpeter swan	<i>Cygnus buccinator</i>	Marshes and littoral zone of lakes.	Bird	SC	-						
Small white lady s slipper	<i>Cypripedium candidum</i>	Deep-soil mesic prairies, wet prairies, calcareous fens.	Vascular plant	SC	-						
Goldie s fern	<i>Dryopteris goldiana</i>	Mesic hardwood forests.	Vascular plant	SC	-						
Blanding's turtle	<i>Emydoidea blandingii</i>	Requires calm, shallow waters with rich, aquatic vegetation for foraging and adjacent sandy uplands for nesting.	Reptile	THR	-						
Rattlesnake master	<i>Eryngium yuccifolium</i>	Upland prairies.	Vascular plant	SC	-						
Kentucky coffee tree	<i>Gymnocladus dioica</i>	Mesic hardwood forests.	Vascular plant	SC	-			x			x
Bald eagle	<i>Haliaeetus leucocephalus</i>	Lakes and rivers in forested areas where tall, large diameter trees are available for nesting.	Bird	WL	-						
Rock fir moss	<i>Huperzia porophila</i>	Moist, well-shaded wooded habitats.	Vascular plant	THR	-						
Milksnake	<i>Lampropeltis triangulum</i>	Deciduous forests, woodlots, savannas, pastures, and prairies.	Reptile	WL	-						
Loggerhead shrike	<i>Lanius ludovicianus</i>	Upland prairie habitats; native and non-native grassland; sometimes in agricultural areas.	Bird	END							
Bullfrog	<i>Lithobates catesbeianus</i>	Wetlands, lakes, ponds, streams, backwaters of rivers.	Amphibian	WL	-						
Western foxsnake	<i>Pantherophis ramspotti</i>	Agricultural fields and farms, grasslands, and riparian woodlands.	Reptile	WL	-						
Louisiana waterthrush	<i>Parkesia motacilla</i>	Mature riparian forests.	Bird	SC	-						
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Upland prairies.	Mammal	SC	-						
Hair-like beak rush	<i>Rhynchospora capillacea</i>	Calcareous fens.	Vascular plant	THR	-						
Three-leaved coneflower	<i>Rudbeckia triloba</i> var. <i>triloba</i>	Mesic floodplain forests and hardwood forests.	Vascular plant	THR	-						
Eastern spotted skunk	<i>Spilogale putorius</i>	Open lands with adequate cover, (e.g., fencerows, shelterbelts, thickets, brush, riparian woodlands).	Mammal	THR	-						
Snow trillium	<i>Trillium nivale</i>	Mesic hardwood forests, floodplain forests.	Vascular plant	SC	-						
Bell s vireo	<i>Vireo bellii</i>	Wet meadow/carr wetlands, upland and lowland prairies.	Bird	SC	-						

a Aquatic species listed in Table 5-10 have been removed from this table since impacts are not anticipated
b END – Endangered; THR – Threatened; SC - Special Concern; WL - Watchlist

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Appendix L

Comments and Responses

Appendix L is published as a stand-alone document. It is provided with all print copies of this EIS. Electronic copies of Appendix L, and the entire EIS, are available on the Department of Commerce's website:

<https://mn.gov/commerce/energyfacilities>. Select "Transmission Lines" and then select "Huntley to Wilmarth Transmission 345 kV Transmission Line Project." It can also be viewed through the Minnesota Public Utilities Commission's website: <http://mn.gov/puc>. Select "eDockets," enter the year ("17") and the docket number ("184" or "185"), and then select "Search."

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