Minot Load Serving Project

Northern States Power Company
McHenry and Ward Counties, North Dakota

Consolidated Application to the North Dakota Public Service Commission for a Waiver or Reduction of Procedures and Time Schedules and Certificate of Corridor Compatibility and Transmission Facility Route Permit



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Northern States Power Company

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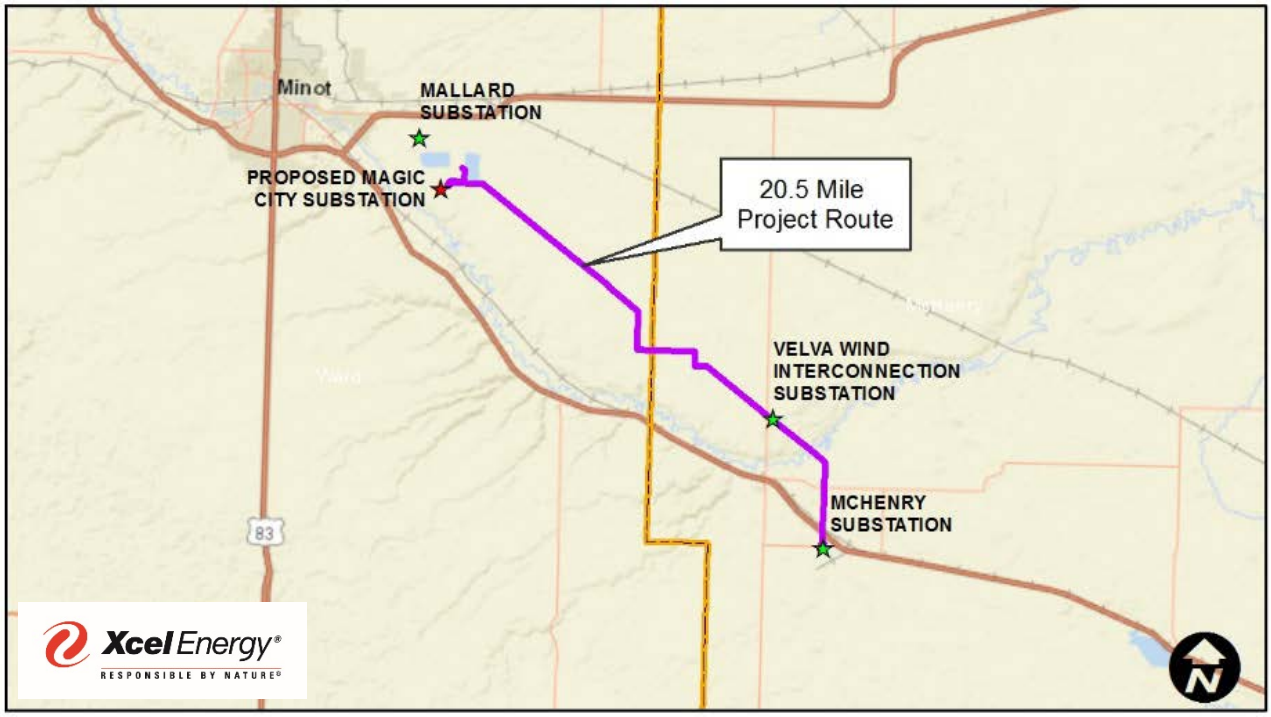
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EXECUTIVE SUMMARY

Northern States Power Company, a Minnesota corporation, doing business as Xcel Energy is proposing to construct the Minot Load Serving Project (Project) to address reliability needs in the City of Minot and surrounding area. The Project, for which Xcel Energy is seeking a Certificate of Corridor Compatibility (Corridor Certificate) and Transmission Facility Route Permit (Route Permit), consists of a new substation, called the Magic City Substation, and an approximately 20.5-mile-long 230 kilovolt (kV) transmission line connecting the new substation to an existing substation, the McHenry Substation, near the City of Velva. The Project will be located in McHenry and Ward Counties, North Dakota, as shown below. Xcel Energy has performed a route study, conducted outreach to local governments and agencies, held a public meeting, obtained several of the required local permits, and has the majority of the land rights (approximately 69 percent) needed to build the new transmission line and substation.



The Project is required to meet increasing electricity demands in the Minot area. A Certificate of Public Convenience and Necessity (No. 5899) was issued by the North Dakota Public Service Commission (Commission) on January 4, 2017.[1] The design of the Project is the result of a joint planning effort with Basin Electric Power Cooperative (Basin). The location for the new Magic City Substation was selected to be near an existing Basin transmission line to allow a future transmission connection to further improve electric reliability in the Minot area.

The majority of the proposed transmission line route follows an existing 115 kV transmission line. Xcel Energy will replace the existing 115 kV transmission line and structures with new single pole steel double circuit structures that will carry both the new 230 kV transmission line and the existing 115 kV line for approximately 20.5 miles. The new structures will be built adjacent to the existing line for the majority of its length. Additional right-of-way (ROW) will be obtained due to the need to build the new line adjacent to the existing ROW to allow the existing 115 kV transmission line to remain in service during construction. The existing 115 kV wooden H-frame structures will be removed once the new double circuit transmission lines have been constructed. North Prairie Township, located on the western side of McHenry County, has an ordinance requiring utilities to be built on section lines, therefore the proposed route deviates from the existing transmission line and follows section or half section lines in North Prairie Township for approximately 4.2 miles. In addition, approximately 1.2 miles of new 115 kV transmission line will be constructed along a new ROW to connect the new Magic City Substation to Xcel Energy's existing electrical grid in the City of Minot.

Upon receipt of all necessary permits, Xcel Energy intends to begin construction in the fall of 2017 and complete construction by the end of 2018, with removal of the existing 115 kV transmission line in the spring 2019.

Xcel Energy has designed the Project to in accordance with North Dakota siting criteria as well as input from state agencies, local municipalities, and landowners. Project impacts are minimized through consolidation of the new 230 kV line with an existing line, thereby avoiding the creation of a new corridor for the majority of the Project route. While a discussion of potential impacts of the Project and Xcel Energy's proposed mitigation of those impacts in accordance with North Dakota Century Code (NDCC) § 49-22-08(1)(g) and North Dakota Administrative Code (NDAC) Chapter § 69-06-05-01(2)(l) is provided in **Section 6.0**, a summary is provided in **Table ES-1**.

Xcel Energy believes that the proposed corridor and proposed route meet the standards set forth in NDCC Chapter 49-22 and requests that the Commission grant the Certificate of Corridor Compatibility and Route Permit.

[1] ORDER, *Northern States Power Company 230 kV Transmission Line-Ward & McHenry Counties Public Convenience and Necessity*, Case No. PU-16-664 (Jan. 4, 2017).

Table ES-1.Resource Impact Minimization

Resource Category	Impact Minimization Summary
Land Use Impacts	• Consolidation of new transmission line with an existing transmission line avoids the requirement for a new corridor. Any other route would require an additional transmission line corridor with additional impacts. • Utilization of single pole structures minimizes the Project footprint. • The majority of landowners have signed easement options for the proposed route. • Six residences are located within 500 feet of route. All have signed written waivers.
Cultural Resources	• Archaeological survey of the corridor has been conducted and a report submitted to the State Historic Preservation Office (SHPO). SHPO concurred that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected* on March 1, 2017. • Minor potential resource areas were mapped for avoidance.
Biological Resources	• Consultation with agencies regarding threatened and endangered species and review of potential habitat did not identify suitable Dakota skipper or other listed species habitat in the Project Corridor. • Installation of bird flight diverters to minimize potential impacts to migrating whooping cranes. • Bald eagle nests were identified and, if occupied, nearby work will be scheduled outside of nesting season.
Wetlands	• Consolidation with an existing transmission corridor minimizes wetland impacts. • Project design avoids impacts where possible by spanning wetlands with the transmission line and avoiding access routes in wetlands. • Coordination with U.S. Fish and Wildlife Service (USFWS) resulted in an agreement that proposed route and structure placement will be compatible with USFWS wetland easements.
Local Permits	• All local permits will be obtained as required to construct the Project. • North Prairie Township required rerouting the new and existing transmission lines along section and half section lines in order to obtain a permit. This resulted in an additional cost of $1.5 million.
Right-of-Way	• The majority of ROW (approximately 69 percent) for the proposed transmission line and substation has been acquired

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1.0 INTRODUCTION

Northern States Power Company,[2] a Minnesota corporation, doing business as Xcel Energy (NSP, Xcel Energy, or the Applicant) is submitting this Application for a Certificate of Corridor Compatibility (Corridor Certificate) and Transmission Facility Route Permit (Route Permit) to construct, operate, and maintain a new 230 kilovolt (kV) transmission line between a proposed Magic City Substation and the existing McHenry Substation (Minot Load Serving Project or Project). The Project consists of constructing the new Magic City Substation in Ward County and a new 20.5-mile-long 230 kV transmission line between the proposed Magic City Substation and the existing McHenry Substation in McHenry County (**Figure 1**). In addition, a new 1.2-mile-long segment of 115 kV transmission line will also be constructed to connect the Magic City Substation to Xcel Energy's existing electrical grid in the City of Minot.

Xcel Energy provides service through an integrated generation and transmission system throughout portions of North Dakota, South Dakota, and Minnesota. Xcel Energy is authorized to conduct business in the State of North Dakota as a public utility subject to the jurisdiction and regulation of the Commission pursuant to Title 49 of the NDCC.[3] Xcel Energy presently serves approximately 92,000 retail electric customers in North Dakota around Fargo, Grand Forks, and Minot and serves 54,000 natural gas customers in the Fargo and Grand Forks areas. Xcel Energy owns just over 430 miles of transmission lines and 20 substations (69 kV and above) in North Dakota.

Xcel Energy also requests a Waiver of Procedures and Time Schedules, a Corridor Certificate, and a Route Permit for the Project (collectively, Application) and respectfully requests that the North Dakota Public Service Commission (Commission) approve the proposed Corridor and Route developed for the Project. A Certificate of Public Convenience and Necessity (CPCN) was issued by the Commission for the Project in Case No. PU-16-664 on January 4, 2017.

1.1 Project Proposal

Xcel Energy proposes to construct the new transmission line as a 230/115 kV double circuit line adjacent to the existing 115 kV line for the majority of its length. The existing transmission line will remain in service during construction and will then be removed after the new lines are energized. Xcel Energy had originally proposed to construct a single circuit 230 kV transmission line adjacent to the existing 115 kV line to meet these needs. However, in conducting public outreach, it became apparent that landowners preferred a double circuit design as opposed to a side-by-side design.

[2] Xcel Energy's address is provided on the front cover of this application. Xcel Energy also operates in North Dakota from the following address: Northern States Power Company, 2302 Great Northern Drive, Fargo, ND 58102.

[3] Xcel Energy's corporate papers are on file with the Commission in Case No. PU-09-664.

Xcel Energy listened to this feedback and revised the proposal to include consolidating the 230 kV and 115 kV transmission lines on single steel pole structures. The 230/115 kV double circuit transmission line will require a 125-foot-wide right-of-way (ROW) and will overlap the existing 115 kV ROW by approximately 37.5 feet (**Figure 2**). As a result, an additional 87.5 feet of new ROW will need to be acquired.

The 230 kV and 115 kV transmission lines from the McHenry Substation will be double circuited to the Magic City Substation where they will terminate (**Figure 1**). North Prairie Township, located on the western side of McHenry County, has an ordinance requiring utilities to be built on section lines to minimize agricultural impacts. While Xcel Energy initially proposed to follow the existing 115 kV ROW through North Prairie Township, the Township denied Xcel Energy's Conditional Use Permit (CUP) and Setback Variance Application for this alignment and requested the Company reapply for a route following section and half section lines. As a result, the proposed route deviates from the existing 115 kV transmission line for approximately 4.2 miles in this area. Xcel Energy's revised CUP permit for this reroute is currently pending before North Prairie Township. In addition, a 1.5 mile segment of single circuit 115 kV transmission line will exit the proposed Magic City Substation to the east and connect to the existing Souris-McHenry 115 kV transmission line, which serves the Souris Substation within the City of Minot.

The Project also includes construction of a new 230/115 kV substation, the Magic City Substation, in Ward County. Approximately 10 acres of the 50-acre Magic City Substation site will be fenced and developed as part of this Project. Of the remaining 40 acres, approximately 10 acres will be used as a staging area during construction. The area that is not fenced for the Project will be planted to prairie grasses after construction. The 230/115 kV transmission lines from the McHenry Substation will be double circuited to the Magic City Substation where they will terminate. A single circuit 115 kV transmission line will exit the Magic City Substation and connect to the 115 kV line to the existing Souris-McHenry 115 kV transmission line (Xcel Energy Line 0850), which serves the Souris Substation.

At the McHenry Substation, owned by Great River Energy (GRE), approximately 60,000 square feet (1.4 acres) will be added to the fenced area on the south side of the existing substation. The southern substation expansion is required to address the 230 kV connection improvements for the Minot Load Serving Project. This expansion will entail the installation of three new circuit breakers (one of which will replace an existing circuit switcher) in a new ring bus configuration. The ring bus will consist of circuit breakers, switching equipment, relaying equipment and electrical bus. GRE will add an additional 75,000 square feet (1.7 acres) on the north side of the substation for a new 115 kV connection for a GRE project, independent of Xcel Energy's Project.

1.2 Project Need

The Project is needed to meet the growing demand for electricity in the Minot area and to reinforce the reliability of the region's transmission system. Xcel Energy currently serves its entire load for the City of Minot from the Souris Substation via two 115 kV transmission lines that were built in the late 1950s and early 1960s. These lines are reaching capacity and experience low voltage conditions when certain elements of the system are out of service. In addition, the McHenry Substation 230/115 kV transformer also experiences overloads when certain elements of the system are out of service. To address these low voltage and overload conditions in the Minot area, Xcel Energy, along with Basin Electric Power Cooperative (Basin) performed a joint electrical study (Joint Minot Load Serving Study, or Minot Study) in 2015 to determine the best overall solution. The Minot Study, included as a part of the CPCN submittal for the Project (Case No. PU-16-644), identified a new 230 kV transmission line from the McHenry Substation to a new 230/115 kV substation (Magic City) as well as reconfiguring and upgrading existing infrastructure as the most effective solution to address the near-term voltage issues and the long-term capacity issues in this area.

1.3 Compliance with the Energy Conversion and Transmission Facility Siting Act and Application Format

The North Dakota Energy Conversion and Transmission Facility Siting Act (Siting Act) requires applications for a Certificate of Corridor Compatibility and Route Permit to meet the criteria set forth in NDCC Chapter 49-22 and NDAC Article 69-06. Consistent with these requirements, Xcel Energy has located and designed the Project to minimize potential environmental impacts and utilize existing ROWs and corridors, field lines, and gaps between crop fields to the extent practicable.

The Application presents information required by the Siting Act, including the consideration of the exclusion areas, avoidance areas, selection criteria, and policy criteria set forth in NDAC § 69-06-08-02. In addition, transmission line design and technical information have been provided to allow a thorough evaluation of the Project.

This Application generally follows the format set forth in the Commission Energy Conversion and Transmission Facility Siting Guidelines (Guidelines), promulgated pursuant to the Siting Act. **Section 1.0** provides an overview of the Application. **Section 2.0** requests waivers of certain procedures and time schedules. **Sections 3.0 through 8.0** present the analyses of the Project and demonstrate how the Project is consistent with the Commission's statutes and regulations.

Table A-1 in **Appendix A** outlines the information required to fulfill the requirements for an Application for a Certificate of Corridor Compatibility and **Table A-2** in **Appendix A** outlines the information required to fulfill the requirements for an Application for a Transmission Facility Route Permit based on the Siting Act (NDCC Chapter 49-22) and NDAC Article 69-06. These tables identify where these requirements are addressed in this Application.

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2.0 WAIVER OF PROCEDURES AND TIME SCHEDULES

Xcel Energy requests that the Commission waive certain procedures and reduce certain time schedules required by the Siting Act and in the Commission's regulations for purposes of siting and constructing this Project. By this Application, Xcel Energy requests that the Commission pursuant to NDCC § 49-22-07.2, waive the following requirement:

That the Commission hold separate hearings as may be required by NDCC §§ 49-22-08 and 49-22-08.1, 49-22-13 and NDAC § 69-06-01-02.

Xcel Energy respectfully requests that the Commission hold a single consolidated hearing on this waiver request and the combined application for a Corridor Certificate and Route Permit. Xcel Energy also requests that the Commission shorten the three-month period specified in NDCC § 49-22-08(5) and the six-month period specified in NDCC § 49-22-08.1(5).

The Waiver of Procedures and Time Schedules (NDAC § 69-06-06-01) requires a facility description (parts a through g), description of need (parts h through j), an estimate of capital cost for the facility (part k), and a justification for the request of a waiver (part l), as well as a factual basis demonstrating that the proposed Project is of such length, design, location, and purpose that it will produce minimal adverse effects (part m). As demonstrated in this Application, including the environmental and cultural resource studies and reports commissioned by the Applicant, Xcel Energy's waiver request and the issuance of a Corridor Certificate and Route Permit are justified because the proposed Project is of such a design, location, and purpose that it will produce minimal adverse effects.

Xcel Energy respectfully requests that the Commission waive provisions of NDAC § 69-06-05-01(f), that require that the width of the corridor must be a least 10 percent of the length of the line, not less than 1 mile, and not more than six miles in width and approve a corridor 300 feet in width and limited areas of wider corridor to ensure coverage of areas with design constraints. This more narrow corridor is appropriate given that the proposed 230 kV transmission line follows an existing 115 kV line for the majority of its length.

Xcel Energy therefore respectfully requests that the Commission grant the requested waivers and/or reduction of procedures and time schedules, and render an expeditious decision approving the requested Corridor Certificate and Route Permit.

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3.0 PROJECT DESCRIPTION

3.1 Project Location

The proposed 230/115 kV transmission line will connect the proposed Magic City Substation in Ward County to GRE's existing McHenry Substation in McHenry County, North Dakota. The proposed Magic City Substation will be located southwest of the intersection of 37th Avenue Southeast and 86th Street Southeast in Section 2, Township 154 North, Range 82 West in Ward County. The McHenry Substation will be expanded and is located in Section 2, Township 152 North, Range 80 West (**Figure 1 and Appendix B).**

Terms associated with the Project and impact analysis are defined in **Table 3-1** and shown on **Figures 3 through 6** and sheet maps in **Appendix B**. In addition, the term Project area is a general term that refers to the general vicinity of the Project; the Project area varies in size depending on the resource being reviewed.

Table 3-1. Project Terms

Term	Definition/Description
Study Area	The area, which includes the Project Corridor, which was studied to determine the best route for the Project. The Project Study Area extends one mile from either side of the Project Route (two mile total width).
Project Corridor	In accordance with NDCC § 49-22-03(4), the Project Corridor is an area of land in which a designated route may be established for a transmission facility. The Project Corridor is 300 feet wide[4]. The proposed Magic City Substation and expansion of the McHenry Substation are included in the Project Corridor.
Project Route	In accordance with NDCC § 49-22-03(10), the Project Route is the location of a transmission facility within a designated corridor. The Project Route is also referred to as the centerline.
Right-of-Way (ROW)	An area around the Project Route where easements will be acquired. The typical easement that will be used during construction and maintained during the life of the Project is 125 feet wide.

The construction of the Project will occur within the Project Corridor identified in **Section 3.3**. The Project Route (centerline of proposed transmission line structure or pole locations) was selected after addressing the factors identified in NDCC § 49-22-09 and pursuant to the criteria in NDAC § 69-06-08-02 and is depicted on **Figure 1 and Appendix B**.

[4] NDAC § 69-06-05-01(2)(f) states that the "width of the corridor must be at least ten percent of its length, but not less than one mile [1.61 kilometers] or greater than six miles [9.66 kilometers] unless another appropriate width is determined by the Commission." However, based on consultation with Commission staff, a smaller corridor was selected as more appropriate for this Project compared to the larger corridor required by the NDAC. As the Applicant's proposed route for the Project follows an existing 115 kV transmission line for nearly its entire length, a more narrow corridor is appropriate and is of sufficient width for the Commission to evaluate the factors addressed in NDCC § 49-22-09. The Company respectfully requests that the Commission grant any variance request that may be required to approve the corridor width.

3.2 Project Proposal, Design, and Product Delivery

Xcel Energy proposes to construct a new 230 kV transmission line on double circuit structures with an existing 115 kV line from GRE's existing McHenry Substation to a new Magic City Substation. The specific components and design of the Project are described below.

3.2.1 Proposed 230 kV Transmission Line

Xcel Energy plans to build the 20.5-mile-long 230/115 kV transmission line on new single pole steel structures generally parallel to Xcel Energy's existing 115 kV transmission line.

Once the new 230/115 kV transmission line has been constructed, the existing 115 kV line and wooden H-frame structures will be removed. The existing 115 kV transmission line has a 75-foot-wide ROW. The 230/115 kV double circuit transmission line will require a 125-foot-wide ROW and will overlap the existing 115 kV ROW by approximately 37.5 feet. As a result, an additional 87.5 feet of ROW will need to be acquired. Approximately 4.2-miles of the route near the McHenry and Ward County border will not follow the existing 115 kV transmission line. This 4.2 mile segment would be routed on half-section lines to comply with North Prairie Township's zoning regulations.

The 230 kV and 115 kV transmission lines from McHenry will be double circuited to the Magic City Substation where they will terminate. A 1.2-mile segment of single circuit 115 kV transmission line will exit the Magic City Substation and connect to the existing Souris-McHenry 115 kV transmission line (Xcel Energy Line 0850), which serves the Souris Substation.

The height of the single pole structures will range from 85 to 130 feet, depending on span length and topography. Typical diagrams of the double circuit single pole structures are shown in **Figures 7a and 7b**. The maximum span between structures will be approximately 1,000 feet and will vary depending on geological or engineering constraints identified during final design. The typical easement, or ROW width, that will be used during construction and maintained during the life of the Project, is 125 feet.

3.2.2 Proposed Magic City Substation

Approximately 10 acres of the 50-acre Magic City Substation site will be fenced and developed as part of this Project. Of the remaining 40 acres, approximately 10 will be used as a staging area during construction. The area that is not fenced for the Project will be planted to prairie grasses after construction. The 230 kV and 115 kV transmission lines from McHenry will be double circuited to the Magic City Substation where they will terminate. A single circuit 115 kV transmission line will exit the Magic City Substation and connect to the 115 kV line to the existing Souris-McHenry 115 kV transmission line (Xcel Energy Line 0850), which serves the Souris Substation.

The 115 kV section of the Magic City Substation will be laid out on the north end of the substation and will be configured in a ring bus consisting of three circuit breakers, switches, relaying equipment, and electrical bus. The 230 kV section will be laid out on the south end of the substation and will consist of a single circuit breaker with switches, relaying equipment, and electrical bus. A 230–115 kV power transformer will be installed near the center of the substation between the 115 kV and 230 kV sections, and a 24-foot by 60-foot electrical equipment enclosure will be installed on the eastern side of the substation.

3.2.3 Existing McHenry Substation

At the McHenry Substation, owned by GRE, approximately 60,000 square feet (1.4 acres) will be added to the fenced area on the south side of the existing substation. The southern substation expansion is required to address the 230 kV connection improvements for the Minot Load Serving Project. This expansion will entail the installation of three new circuit breakers (one of which will replace an existing circuit switcher) in a new ring bus configuration. The ring bus will consist of circuit breakers, switching equipment, relaying equipment and electrical bus. GRE will add an additional 75,000 square feet (1.7 acres) on the north side of the substation for a new 115 kV connection for a GRE project, independent of Xcel Energy's Project.

3.2.4 Staging Areas

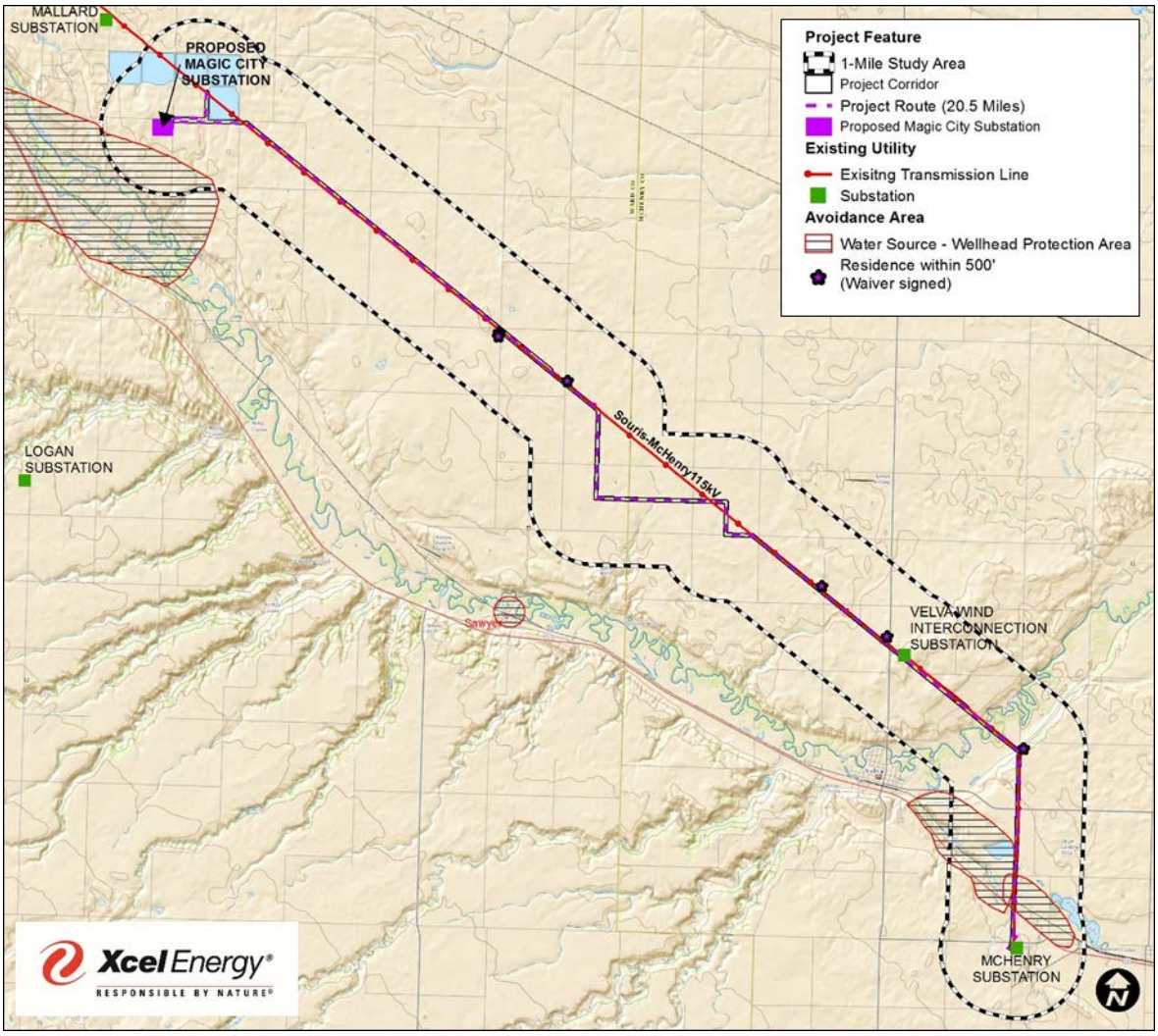
Two material and equipment staging areas will be utilized during construction. Preliminarily identified staging area locations are within an existing gravel pit north of the Souris River, at the Magic City Substation site, and the area south of the McHenry Substation.

3.2.5 Product

The Project will transmit electric energy (the product for purposes of this Application) primarily from sources within North Dakota and South Dakota and will support reliable electric service in and around Minot.

3.3 Overview of Initial Siting and Routing Area, Study Area, Project Corridor, and Route Selection Process

The proposed Project Corridor and Project Route presented in this Application were the result of an extensive data collection and review process, coordination with federal, state, and local agencies, public participation, and the criteria listed in NDAC § 69-06-08-02. The Project Study Area, Project Corridor, and Project Route are shown in the following graphic. There are no exclusion areas within 500 feet of the Project Route. Avoidance areas are shown in the graphic, and consist of 6 residences located within 500 feet of the Project Route, one well located approximately 350 feet from the Project Route, and an associated wellhead protection area that is crossed by the Project Route. Xcel Energy has received written waivers for the six residences. This section of the Application describes the process that Xcel Energy underwent to develop the Study Area, Corridor, and Route presented in this Application.



3.3.1 Initial Siting and Routing Area

The routing process began with the identification of an initial siting and routing area to determine the best location for the Project. The initial siting and routing area was determined based on the Project's end points. The Project's end points were determined based on the need to connect to the existing McHenry Substation owned by GRE and located approximately 20 miles southeast of the City of Minot, North Dakota, with the Minot area. The McHenry Substation was identified as the nearest existing strong energy source on the existing 230 kV transmission system. The northern substation endpoint needed to connect to existing facilities on the eastern fringe of the City of Minot near the existing Mallard Substation owned by Basin. The area initially reviewed for siting and routing was an approximately 280-square-mile rectangle centered on Basin's Mallard Substation and GRE's McHenry Substation (**Figure 3**).

3.3.2 New Magic City Substation Site Selection

Selection of the new Magic City Substation site east of the City of Minot was primarily guided by the need to connect the new 230 kV line to existing transmission facilities near the Mallard Substation, specifically the existing Souris-McHenry 115 kV transmission line and the existing Garrison Max-Mallard and Mallard-Logan 115 kV transmission lines owned by Basin. However, the area near the Mallard Substation is constrained by existing and possible future residential development. Also, the City of Minot wastewater treatment ponds are located south of the Mallard Substation. Efforts to avoid residential areas focused the site selection immediately south of the wastewater treatment ponds. Specific substation sites were assessed based on proximity to connection points to existing transmission lines, avoidance of wetlands, accessibility, and engineering suitability. In addition, meetings were held with landowners of the highest ranking sites and Xcel Energy agreed to terms to purchase the proposed Magic City Substation site.

The selection of the proposed Magic City Substation site was based on the following criteria:

- Near existing 115 kV transmission lines: One mile east of Basin's Garrison Max-Mallard and Mallard-Logan 115 kV line and 1.3 miles southwest of the existing Souris-McHenry 115 kV line.
- Compatible land use: Near wastewater treatment ponds and away from existing and proposed residential development.
- Engineering considerations: Directly accessible from 37th Avenue and relatively level site requiring minimal grading.
- Environmental impacts: No wetland, wooded area, or other habitat affected.
- Human/social impacts: No residences on land and willing seller.

After the Magic City Substation site was selected, Xcel Energy examined the siting and routing area between the existing McHenry Substation and the proposed Magic City Substation site. Within this siting and routing area, Xcel Energy assessed exclusion and avoidance areas, as well as routing opportunities and other constraints. Specifically, Xcel Energy identified linear features within the area that provided routing and ROW sharing opportunities as potential opportunities. Identified existing linear features, and their opportunities and constraints, are summarized in **Table 3-2** and shown on **Figures 3 and 8**.

Table 3-2. Existing Linear Features within the Initial Siting and Routing Area

Existing Linear Feature	Opportunities	Constraints
Highway 52	• Existing highway corridor • Provides a direct route between end points	• Crosses high concentration of residences and developed areas • Rugged terrain • Requires additional Souris River crossing • Introduces visual impacts within Souris River valley • Large portions located within mapped floodplains
Highway 41 and BNSF Railroad	• Existing developed north/south corridor	• Approximately 4 miles longer route than proposed route • Crosses many residences along Highway 41 • Close to Linrud Air Strip located at 49th Street North • Crosses various U.S. Fish and Wildlife (USFWS) wetland easements
Highway 41 / BNSF Railroad / Mallard - Rugby	• Existing developed north/south corridor	• Approximately 6 miles longer route than proposed route • Crosses many residences along Hwy 41 • Close to Linrud Air Strip located at 49th Street North • Crosses various USFWS wetland easements
Canadian Pacific Railroad	• Existing railroad corridor • Diagonal feature close to northern and southern endpoints	• Requires multiple crossings of Souris River • Large portions located within mapped floodplains • Passes through Velva, Sawyer and Logan
Garrison Max-Mallard and Mallard-Logan 115 kV Electric Transmission Lines	• Existing transmission line corridor	• 12 miles longer route than proposed route • Significantly more streams located south of Souris River than north of Souris River
Souris-McHenry 115 kV Electric Transmission Line (Proposed Route)	• Existing transmission line corridor • Provides direct route between endpoints	• Crosses various USFWS wetland easements
Property Line Boundaries (multiple options)	• Minimizes impacts to agricultural land • Follow existing field roads in many places	• Longer routes than a diagonal between endpoints • Crosses existing electric transmission lines multiple times • Adds another transmission corridor in close proximity to existing Souris River crossing.

Based on this examination of the initial siting and routing area and potential corridors within that area, Xcel Energy then focused on identifying a Study Area and Project Corridor.

3.3.3 Study Area

After Xcel Energy identified linear features that provided routing and ROW sharing opportunities, the existing 115 kV transmission line was identified favored project siting corridor. Xcel Energy then established a Study Area of one mile on either side of the existing 115 kV transmission line in accordance with NDAC § 69-06-05-01. Xcel Energy then evaluated the Study Area for exclusion and avoidance areas, and selection and policy criteria as required by NDCC § 49-22-09.

3.3.4 Project Corridor

In accordance with NDCC § 49-22-03(4), the Project Corridor is an area of land in which a designated route may be established for a transmission facility. NDAC § 69-06-05-01 requires that, "The width of a corridor must be at least ten percent of its length, but not less than one mile [1.61 kilometers] or greater than six miles [9.66 kilometers] unless another appropriate width is determined by the Commission". Based on early consultation with Commission staff, it was determined that a 300-foot-wide Project Corridor would provide an appropriate amount of information for this specific Project, and would be appropriate for this Application. In certain locations where the route is less certain, the Project Corridor is wider than 300 feet in order to accommodate minor adjustments. The proposed Magic City Substation and McHenry Substation expansion are included in the Project Corridor.

Xcel Energy developed the Project Corridor after a Study Area analysis, examination of potential corridors (**Table 3-2**), agency coordination, and public involvement. Based upon Xcel Energy's initial review of the potential corridors, presented in **Table 3-2**, the least impactful corridor and route option would follow the existing Souris-McHenry 115 kV transmission line corridor between the two endpoints for the Project (i.e., the proposed Magic City Substation and the existing McHenry Substation). By following the corridor of the existing 115 kV transmission line, the Project Corridor meets the policy criteria of utilizing existing ROW that is listed in Part 4 of the NDAC § 69-06-08-02. Xcel Energy also considered the exclusion and avoidance areas set forth in NDAC § 69-06-08-02 in selecting the Project Corridor. Impacts to exclusion or avoidance areas and resources listed in Selection Criteria that are identified in Part 3 of NDAC § 69-06-08-02, including wetlands, can be avoided or minimized by placing poles outside these areas.

The Project Corridor follows that existing 115 kV transmission line between the McHenry Substation and the Magic City Substation and is rural and primarily composed of a mixture of cropland and grassland. It is located on privately owned land and is located parallel to the existing 115 kV transmission line for the majority of the Project. The legal land descriptions for parcels within the Project Corridor are provided in **Table 3-3** and represented on the sheet maps in **Appendix B**.

Table 3-3. Project Corridor Land Description

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 14, 15, 16, 22, 23, 24, 25, 36
	154 N	82 W	1, 2
	155 N	81 W	31
	155 N	82 W	35, 36
McHenry	152 N	80 W	2, 3
	153 N	80 W	3, 4, 5, 10, 11, 13, 14, 24, 25, 36
	154 N	80 W	31, 32

3.3.5 Project Route

After narrowing the focus to the existing 115 kV corridor, Xcel Energy identified the Project Route within the Project Corridor by taking into account the exclusion and avoidance criteria outlined in NDAC § 69-06-08-02 (**Section 5.0** of this Application) and after considering public input and agency input as described below and in **Section 7.0** of this Application.

The public outreach process consisted of obtaining landowner information for landowners within the Project Corridor, and mailing a Project information sheet and invitation to an open house in Sawyer, North Dakota on December 15, 2015. Approximately 25 people attended the public meeting and provided feedback. Of these, Xcel Energy estimates that 18 were landowners, consequently approximately 50 percent of the landowners attended the public meeting. Landowners at this meeting did not support routing the new 230 kV transmission line parallel to the existing 115 kV transmission line due to additional farming impacts. Rather landowners requested the route for the new 230 kV transmission line use of the existing line route and be combined with the existing 115 kV line on new single pole structures. In incorporating the feedback, Xcel Energy had to balance additional cost, reliability, and constructability factors in evaluating whether the existing 115 kV line and the new 230 kV line could be combined in a double circuit configuration.

In finalizing a proposed route, Xcel Energy also took into account the criteria listed in NDAC § 69-06-08-02. These criteria include exclusion and avoidance areas, selection criteria that relate to minimizing potential land use and environmental impacts, and policy criteria that relate to maximizing public benefits. These factors are discussed in **Section 5.0**. In selecting the proposed route, Xcel Energy also took into account several additional considerations, including:

- Minimizing impacts on residents, including (but not limited to) displacement, noise, aesthetics, recreation, agricultural production, and public service
- Consideration of effects on public health and safety
- Maximizing the amount of ROW adjacent to existing utility ROW
- Minimizing effects on archaeological, architectural, and historic resources
- Minimizing effects on wetlands, surface waters, and rivers
- Minimizing effects on wildlife, rare or endangered species, and unique natural resources
- Minimizing total length and construction costs

Based on an evaluation of these criteria as well as the other factors listed above, Xcel Energy selected a route that follows an existing 115 kV transmission line between the McHenry substation and the new Magic City Substation siting area.

After selecting this proposed route, Xcel Energy set about to obtain the necessary local permits for construction of this route. Xcel Energy obtained the necessary permits from McHenry[5] and Ward[6] counties for the proposed 230 kV transmission line.

Xcel Energy also sought to obtain a CUP and Setback Variance from North Prairie Township. North Prairie Township's Zoning Regulations state that "above ground utilities shall be placed in a manner which will not place undue hardship on normal farming operations. Utility placement shall conform with section lines, highway (state and federal) and railroad right-of-ways."[7] While the proposed route following the existing 115 kV transmission line did not follow section lines within North Prairie Township, Xcel Energy conferred with North Prairie Township officials who indicated that this route complied with the intent of the regulation of minimizing impacts to farming operations. Xcel Energy therefore submitted a CUP and Setback Variance application for the double circuit option on October 18, 2016.

The North Prairie Township Board considered the application at a December 19, 2016 hearing. At this hearing, several landowners opposed the use of the existing corridor, regardless of whether or not the new line was consolidated with the existing line. Rather, these landowners requested that the new 230 kV line as well as the existing 115 kV line be located on section lines or half-section lines to minimize impacts to agricultural operations. Xcel Energy also presented its position at this hearing noting that consolidating these two lines along the existing 115 kV route is the shortest route and reduces land use impacts from the existing condition. After deliberation, the North Prairie Township Board denied Xcel Energy's application citing the Township's Zoning Regulation requiring new utilities to be sited to conform with section lines. The North Prairie Township Board clarified that a route along half-section lines would also be acceptable and that any new application must include removal of the existing 115 kV and consolidating this line with the new 230 kV line.

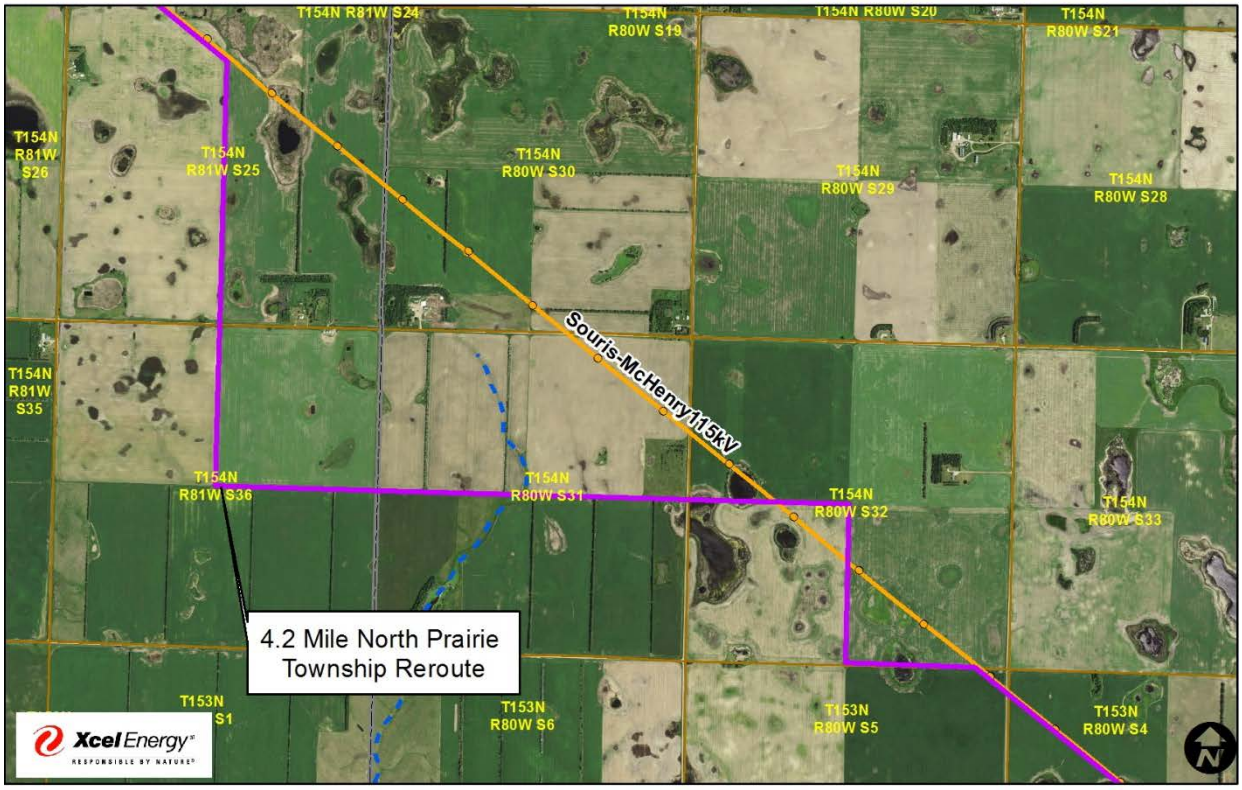
Given this denial, Xcel Energy revised the portion of the route within North Prairie Township to follow section and half-section lines. In addition, Xcel Energy rerouted a portion of the line in Ward County to ensure that the proposed transmission line was 500 feet away from an inhabited rural residence as required by NDCC § 49-22-05.1. The North Prairie Township reroute adds approximately $1.5 million when compared to the double circuit route following the existing 115 kV

[5] A Conditional Use Permit (CUP), necessary to construct a transmission line within the McHenry County Agricultural District, was approved by the McHenry County Board of Commissioners in December 2016. A Setback Variance was also approved by the McHenry County Board of Commissioners in February 2017 to permit the placement of transmission structures within setback areas.

[6] A Special Use Permit (SUP) and Setback Variance are not required in the Agricultural Zoning District per the Ward County Zoning Ordinance confirmation has been provided by the Ward County Planning and Zoning Administrator

[7] North Prairie Township Zoning Regulation at Section 6 (B)(1)(a) and (b).

transmission line corridor. This reroute gained verbal approval from 9 of the 11 landowners along the proposed alignment. Verbal approval has been provided for all parcels located within North Prairie Township limits. Two landowners, who own properties outside of North Prairie Township limits, are opposed to the reroute. **Figure 9** and the following graphic show the location of the 4.2-mile North Prairie Township reroute in relation to the existing Souris-McHenry 115 kV transmission line.



Xcel Energy submitted a revised CUP and Setback Variance application to North Prairie Township on February 17, 2017 with this reroute. A hearing before the North Prairie Township has been scheduled for March 15, 2017. Xcel Energy will update the Commission following this hearing.

The proposed Route presented in this Application includes the North Prairie Township reroute and the remainder of the proposed Route follows the existing 115 kV transmission line between the existing McHenry Substation and the proposed Magic City Substation.

Figures 3 through 6 identify the Project Route relative to the Project Corridor and exclusion and avoidance criteria. The legal descriptions of the Project Route location are provided in **Table 3-4**.

Table 3-4. Project Route (Centerline) Land Description

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, 22, 23, 24, 25, 36
	154 N	82 W	1, 2
	155 N	82 W	35, 36
McHenry	152 N	80 W	2, 3
	153 N	80 W	3, 4, 5, 10, 11, 13, 14, 24, 25, 36
	154 N	80 W	31, 32

3.4 Project Cost

The total cost of the Project is estimated at $50.5 million (in 2018 dollars) and will be paid for by Xcel Energy.

3.5 Project Schedule

The preliminary Project schedule in **Table 3-5** is based on information known as of the date of this filing. The operation date is dependent upon permitting, equipment deliveries, and other development activities. Xcel Energy is targeting starting construction of the Project for September 2017 provided all pre-construction permits and approvals have been obtained.

Table 3-5. Preliminary Project Schedule

Milestone	Date
Obtain Certificate of Corridor Compatibility	August 2017
Obtain Transmission Facility Route Permit	August 2017
Complete Right-of-Way Acquisition	August 2017 (not including acquisitions by eminent domain)
Construction Start	September 2017
Construction Complete and Testing	December 2018
In-Service Operations (Commissioning)	December 2018
Removal of 115 kV Transmission Line	Spring 2019

3.6 Easement Acquisition

As of the date of this filing, Xcel Energy has acquired voluntary easement options comprising approximately 66 percent of the necessary ROW for the 230/115 kV Project Route and 100 percent of the 1.2 mile-long 115 kV segment. A 50-acre parcel was purchased for the Magic City Substation site in October 2016. Xcel Energy will work with the remaining landowners to secure easement options for the remainder of the Project Route. Easements will be executed prior to construction. Xcel Energy will compensate landowners for all acquired easement rights based on fair market value of the easement area as determined by a qualified appraiser. The easement agreement describes easement conditions and restrictions. In the rare instances where a negotiated settlement cannot be reached with a landowner regarding easement acquisition,

valuation will be made through the utility's exercise of the right of eminent domain pursuant to NDCC Chapter 32-15. Pre-existing easements will be released following the removal of the 115 kV transmission line.

3.7 Project Construction

Construction of a transmission line follows the sequence of surveying the centerline, determining construction access, ROW preparation, installing foundations, assembling and erecting the structures, installing shield wires and conductors, installing ground rods, removal of existing H-frame structures, and cleanup and restoration. Various phases of construction occur at different locations throughout the construction process and, in some cases, at the same time at different locations. The steps in this process are described in greater detail below.

Construction will begin after federal, state, and local approvals are obtained; property and ROW are acquired; soil conditions are established; and final design is completed. The precise timing of construction takes into account various requirements that may be in place due to permit conditions, electrical system loading issues, and available workforce.

3.7.1 Right-of-Way Preparation

The Project Route is located in agricultural land along an existing transmission line ROW, therefore, there are very few obstructions and minimal ROW preparation will be necessary. In those limited areas where there is tree and shrub growth, all trees and tall shrubs will be cut and removed from the 125-foot ROW unless future growth is not anticipated to interfere with the operation or maintenance of the transmission line. Vegetation remaining within the ROW will be monitored regularly and controlled so that it does not exceed safety provisions. Herbicides may be used in limited locations within the ROW to remove or control the growth of tall vegetation. Herbaceous and small woody plants outside of access routes and established disturbance areas around each structure will not be disturbed.

As required by the Commission's tree and shrub replacement guidelines, a tree inventory will be completed for all wooded areas that are cleared and an appropriate mitigation plan will be prepared. As required by the Commission, this work will be completed after all tree clearing has been completed along the Project Route.

3.7.2 Transmission Line Construction

Typical construction equipment that will be used on the Project consists of tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front-end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete trucks, and various trailers. Many types of excavation equipment are set on wheel- or track-driven vehicles. Transmission structures will be transported on tractor-trailers.

Staging areas are usually established to store the equipment and materials necessary to construct the new transmission line facilities until they are needed. Temporary laydown areas may be required for additional space for storage during construction. These areas will be selected for their location, access, security, and ability to efficiently and safely warehouse supplies and will be sited to minimize excavation and grading. The temporary laydown areas and any staging areas outside the transmission line ROW will be obtained from affected landowners through rental agreements. Two temporary staging areas are anticipated to be used for the Project.

Access to the transmission line ROW corridor will typically be made directly from existing roads or trails close to the transmission line ROW. In some situations, private field roads or trails will be used. Coordination with the property owner will occur prior to accessing the transmission line corridor.

When it is time to install the transmission structures, they will be moved from the staging area and delivered to the staked location. Structures will typically be placed within the ROW until set. Insulators and other hardware will be attached while the structures are on the ground.

The structures will then be lifted, placed, and secured using a crane. In general, structures will either be direct embedded or installed on concrete drilled pier foundations, depending on the actual structure load and soil conditions. Direct embed structures will be placed in steel culvert lined holes approximately 5 feet in diameter and 20 or more feet deep. Poles are placed in the drilled culverts and secured in place with gravel backfill. Drilled pier concrete foundations will be approximately 10 feet in diameter and 30 or more feet deep depending on soil conditions. After the concrete foundation is set, the structure will be bolted to the foundation.

Typically, structure sites with 10 percent or less slope are not graded or leveled. Sites with more than a 10 percent slope may require some grading to construct working pads. If the landowner permits, it is preferred to leave the leveled areas and working pads in place for use in future maintenance activities. If permission has not been obtained, the site will be graded back to its original contours with topsoil replaced. Excess soil from foundation holes will be offered to the landowner for disposal on the structure site or other location on the property within reasonable proximity to the construction site. If on-site disposal has not been permitted, it will be removed from the site.

Once structures have been placed, conductors will be installed by establishing stringing setup areas within the ROW or on temporary construction areas outside the ROW. These stringing setup areas are usually located every two miles along a Project Route. Conductor stringing operations will also require brief access to each structure to secure the conductor wire to the insulator hardware and the shield wire to clamps once design sag is parameters are met. Where the transmission line crosses streets, roads, highways, or other energized conductors or obstructions, temporary guard or clearance poles may be installed so that the conductors do not

obstruct traffic or contact existing energized conductors or other cables during stringing operations and to protect the conductors from damage. Once a section of the transmission line has been installed, temporary structures will be removed and holes will be backfilled. Bird flight diverters will be installed along the entire length of the transmission line. The existing 115 kV transmission line and wooden H-frame structures will be removed once the 230/115 kV line is energized.

Environmentally sensitive areas and wetland areas may also require special construction techniques in some circumstances. The most effective way to minimize impacts to wet areas is to span all streams and rivers. During construction, construction mats may be placed in wet or soft soil locations and in narrow ditches to minimize disturbance. These mats can also provide access to sensitive areas during times when the ground is not frozen to minimize impacts at the site. Construction equipment will not be allowed to cross waterways except under special circumstances, and only after discussion with appropriate resource agencies. Where waterways must be crossed to pull in the new conductors and shield wires, workers may walk across, use boats, or drive equipment across ice in the winter. These construction practices help prevent soil erosion. Neither equipment fueling nor lubricating will not occur near waterways or wetlands.

3.7.3 Restoration Procedures

After construction, all temporary facilities, including staging areas, will be removed. Materials with salvage value, including conductor reels, unused conductor and hardware, poles, and other materials, will be removed from the site for reuse. All other debris will be disposed of in accordance with local, state, and federal regulations.

Construction crews will attempt to limit ground disturbance wherever possible. However, areas may be disturbed during the normal course of work, which typically lasts only a few days in any one location. As construction is completed, disturbed areas will be restored to their original condition by smoothing any ruts and re-vegetating. If damage has occurred to crops, fences, or the property, repairs will be made or the landowner will be fairly reimbursed.

Areas with significant soil compaction and disturbance from construction activities may require assistance to re-establish vegetation and control soil erosion. Methods commonly used to accomplish this include deep plowing to decompact soil, prompt reseeding of disturbed areas, erosion control blankets, silt fences, and weekly inspection of construction sites for compliance. Erosion control and vegetation establishment practices that are regularly used in construction projects will be prescribed in a storm water pollution prevention plan (SWPPP) Restoration activities will include grooming, reseeding, and replacing trees and shrubs as necessary in disturbed areas. Xcel Energy will incorporate a tree replacement policy based on the Commission’s tree and shrub mitigation guidelines.

4.0 NEED FOR FACILITY

4.1 Need Analysis

The Project is required to increase the electric transmission capacity to meet the growing electricity demand in Minot and the surrounding area. Xcel Energy currently serves its entire load for the City of Minot from the Souris Substation via two 115 kV transmission lines that were built in the late 1950s and early 1960s. These lines are reaching capacity and experience low voltage conditions when certain elements of the system are out of service. In addition, the McHenry Substation 230/115 kV transformer also experiences overloads when certain elements of the system are out of service.

To address these low voltage and overload conditions in the Minot area, Xcel Energy, along with Basin performed a joint electrical study (Minot Study) in 2015 to determine the best overall solution. The Minot Study, included as a part of the CPCN submittal for the Project (Case No. PU-16-644), identified a new 230 kV transmission line from the McHenry Substation to a new 230/115 kV substation (Magic City) and called for reconfiguring and upgrading existing infrastructure as the most effective solution to address the near-term voltage issues and the long-term capacity issues in this area.

The Project was also reviewed by the Midcontinent Independent System Operator (MISO) as a part of their MISO 2015 Transmission Expansion Plan (MTEP). The Project was approved in order to address the McHenry Substation overloads. The MTEP identified the existing McHenry Substation as likely experiencing overloads by winter 2018, and the Project is proposed to be in service before that time.

A CPCN was issued by the Commission for the Project in Case No. PU-16-644 on January 4, 2017.

4.2 No Action and Feasible Alternative Methods

A no action alternative will likely result in a decrease in the reliability of electric service within the Project area due to increased overloads and low voltage conditions as load in the Minot area continues to grow. The new 230 kV line and new 230/115 kV transformer will unload the identified overloaded facilities and provide voltage support to increase the reliability in the area.

The Project will largely be located adjacent to an existing utility corridor. If the Project is not built along the existing utility corridor, construction of additional new electric transmission lines will be required in a different location to meet the growing electric demand in the Project area. An alternative route or method will likely cause greater impacts by being built in a new utility corridor. Therefore, the proposed route was identified as the least impactful way to meet the energy demand of the Project area.

No portion of the Project will require underground transmission. While it is common for lower voltage lines to be buried, it is rare for high-voltage transmission lines to be constructed underground. Although transmission lines can be placed underground, the cost to construct underground can be many times higher than the cost of overhead construction. Underground transmission also results in higher operation and maintenance costs. Because of the significantly greater expense associated with underground transmission construction, the use of underground technology is limited to locations where the impacts of overhead construction are completely unacceptable or where physical circumstances allow for no other option. In addition, the installation of underground transmission by trenching results in more extensive temporary environmental impacts than for overhead transmission lines, including greater wetland impacts and the potential for soil compaction. Xcel Energy concluded that the environmental and land use setting of the Project did not warrant underground construction on any portion of the new 230/115 kV transmission line.

4.3 Ten-Year Plan

Xcel Energy filed a Ten-Year Plan with the Commission on July 1, 2016, under Case No. PU-16-489.[8] This Project is consistent with this Ten-Year Plan.

[8] Xcel Energy's Ten-Year Plan is available online at http://www.psc.nd.gov/database/documents/16-0489/001-010.pdf

5.0 SUMMARY OF TRANSMISSION FACILITY CORRIDOR AND ROUTE CRITERIA

This section provides a summary of transmission line siting, corridor, and route criteria that were evaluated by Xcel Energy in determining the Project's end points, the proposed Project Study Area, Project Corridor, Project Route, and line configuration.

The North Dakota Energy Conversion and Transmission Facility Siting Act (Act) and the Commission's rules pursuant to the Act provide a robust framework for transmission siting decisions. This framework is the routing criteria, including exclusion areas, avoidance areas, selection criteria, and policy criteria provided in NDAC § 69-06-08-02. The routing criteria identify those environmentally and socially important areas that may be impacted by the transmission facility and provide guidance as to which areas where no transmission facilities can be sited, which areas to avoid if possible, and the necessity to mitigate, to the fullest extent possible, impacts to certain environmental, social, and human resources when developing and approving transmission corridors and routes. Additionally, the Act provides guidance to the Commission as to certain factors to be considered in evaluating applications and designation of corridors and routes (NDCC § 49-22-09).

Xcel Energy gathered data from several sources to identify the locations of exclusion and avoidance areas and to determine the potential impact of its proposed facility on selection criteria, including field surveys to identify occupied residences and cultural resources. A computerized geographic information system (GIS) was utilized to compile and analyze most of the data. A complete list of the data sources reviewed will be provided to the Commission upon request. Some of the data sources reviewed included:

- North Dakota Natural Heritage Program dataset on sensitive species and habitats
- North Dakota Forest Service State Forest dataset
- USFWS National Wetland Inventory (NWI) maps obtained in GIS format
- Documented cultural resources identified through a Class I Cultural Resources Inventory
- Structures and other constraints (including extractable resources, cemeteries, and communication towers) derived from data obtained from the North Dakota GIS Hub as well as aerial photo interpretation, discussion with landowners, and field verification
- National Land Cover Database data (NLCD)

A specific description of the compliance with the NDAC § 69-06-08-02 is described in the **Sections 5.1 through 5.4** of this document.

5.1 Exclusion Areas

In accordance with NDAC § 69-06-08-02(1), the geographical areas listed in **Table 5-1** have been excluded in the consideration of a route for a transmission facility. No exclusion areas are present within the Project Corridor.

Table 5-1. Exclusion Areas

Exclusion Area	Present within One-mile Study Area	Present within 300-foot Project Corridor	Crossed by Project Route	Proposed Buffer
Designated or registered national parks memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.
Designated or registered state parks; historic sites; monuments; historical markers; archaeological sites; and nature preserves	Class I Literature Search identified 23 recorded cultural resource sites.	Eight sites were recorded during Class III cultural field surveys. SHPO concurred that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected* on March 1, 2017.[1] GRE did not identify any recorded cultural resources within the McHenry Substation expansion area.	One site was recorded during Class III cultural field surveys. SHPO concurred that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected* on March 1, 2017.[1]	No buffer is proposed because the SHPO concurred on March 1, 2017 that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected*. An Unanticipated Discovery Plan will be prepared for the Project outlining the procedures that will be followed to prepare for and address any unanticipated discoveries of cultural resources, including previously undiscovered archeological sites and possible human remains (see **Section 6.7**).
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.
Areas critical to the life stage of threatened or endangered animal or plant species	No designated critical habitat	No designated critical habitat	No designated critical habitat	No buffer is proposed because no features are identified within the Project Corridor.

Table 5-1. Exclusion Areas

Exclusion Area	Present within One-mile Study Area	Present within 300-foot Project Corridor	Crossed by Project Route	Proposed Buffer
Areas where animal or plant species that are unique or rare to this state will be irreversibly damaged	No – remnant native prairie was identified within the Study Area: however areas outside of the Project Corridor will not be impacted by the Project.	No – agency coordination and field and desktop habitat surveys of the Project Corridor verified that irreversible damage to unique or rare species habitat will not occur.	No	No buffer is proposed because no features are identified within the Project Corridor.
Areas within 1,200 feet of the geographic center of the intercontinental ballistic missile (ICBM) launch or launch control facility	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.
Areas within 30 feet on either side of a direct line between ICBM launch or launch control facilities to avoid microwave interference	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.

1 Approximately 6.1 miles of corridor was not surveyed because of restricted access or wetlands. Based upon a review of the Project documentation, SHPO determined that a Class III cultural field survey was not warranted for these remaining areas.

5.2 Avoidance Areas

In accordance with NDAC § 69-06-08-02(2), the Commission will not approve certain avoidance areas as a site for a transmission facility unless the applicant shows that under the circumstances there is no reasonable alternative. In determining whether an avoidance area should be designated for a transmission facility, the Commission may consider, among other things, the proposed management of adverse impacts, the orderly siting of facilities, system reliability and integrity, the efficient use of resources, and alternative sites.

The Class I Literature Search for the Project identified two recorded cultural site leads (cultural material scatter) as occurring within the Project Corridor (**Table 5-2**). Field surveys were conducted to determine whether resources associated with these site leads exist in Project Corridor and whether previously unidentified cultural resources are present. A Class III Cultural Resource Inventory of the Project Corridor was conducted by Metcalf Archaeological Consultants, Inc. (Metcalf). Metcalf surveyed a total of 18.1 miles of the Project Corridor, 6.4 miles of access routes, and the McHenry Substation site. The remaining 1.9 miles of Project Corridor was not surveyed because of restricted access or the presence of wetlands. No evidence of the two prehistoric site leads was found within the Project Corridor. The survey identified eight newly recorded sites consisting of two architectural sites, one architectural site lead, three historic sites,

and two prehistoric isolated finds. Of the eight sites identified, six are located within the Project Corridor, one is located along an access route, and one is located within the existing McHenry Substation site. GRE and their consultant reviewed cultural resources for the McHenry Substation site expansion, and determined there are no recorded cultural resources within the property. Metcalf recommended that the eight sites be recorded as not eligible for inclusion in the National Register of Historic Places (NRHP), and therefore no avoidance measures were recommended. Metcalf also recommended a finding of *No Historic Properties Affected.* A report was submitted to the SHPO on February 27, 2017 and SHPO concurrence was received on March 1, 2017 (**Appendix C**).

After the North Prairie Township reroute was identified, Metcalf confirmed with the SHPO on February 8, 2017 that, based upon a review of the Project documentation a Class III cultural field survey was not warranted for the new segment of transmission line route. A record of this correspondence from the SHPO is included in **Appendix C**.

Table 5-2. Avoidance Areas

Avoidance Area	Present within One-mile Study Area	Present within Project Corridor	Crossed by Project Route	Proposed Buffer
Designated or registered national historic districts; wildlife areas; wild, scenic or recreational rivers; wildlife refuges; and grasslands	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.
Designated or registered state wild, scenic, or recreational rivers; game refuges; game management areas; forests, forest management lands; and grasslands	No	No	No	J. Clark Salyer and Audubon Wetland Management Districts cover the entire Study Area. Xcel Energy coordinated with the USFWS to avoid wetland easement impacts within the WMD boundaries.

Table 5-2. Avoidance Areas

Avoidance Area	Present within One-mile Study Area	Present within Project Corridor	Crossed by Project Route	Proposed Buffer
Historical resources that are not specifically designated as exclusion or avoidance areas	Class I Literature Search identified 23 recorded cultural resource sites.	Eight sites were recorded during Class III cultural field surveys. SHPO concurred that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected* on March 1, 2017.[1] GRE did not identify any recorded cultural resources within the McHenry Substation expansion area.	One site was recorded during Class III cultural field surveys. SHPO concurred that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected* on March 1, 2017.[1]	No buffer is proposed because the SHPO concurred on March 1, 2017 that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected*. An Unanticipated Discovery Plan will be prepared for the Project outlining the procedures that will be followed to prepare for and address any unanticipated discoveries of cultural resources, including previously undiscovered archeological sites and possible human remains (see **Section 6.7**).
Areas that are geologically unstable	Two landslide deposit areas are located within the Study Area	No	No	No buffer is proposed because no features are identified within the Project Corridor.
Within 500 feet of a residence, school, or place of business	Six residences are located within 500 feet of the centerline	No	No	In accordance with NDAC § 69-06-08-02, Xcel Energy has obtained written waivers from the owners of the six residences located within 500 feet of the centerline. (NDCC. § 49-22-05.1)
Reservoirs and municipal water supplies	Yes, City of Velva and Minot-Sundre Aquifer wellhead protection areas	Yes, City of Velva wellhead protection area	Yes, City of Velva wellhead protection area	The City of Velva wellhead protection area is located at the southern end of the Project Route. However, best management practices (BMPs) will be used to minimize potential impacts to surface and ground water.
Water sources for organized rural water districts	Yes, North Prairie Rural Watershed District III	Yes, North Prairie Rural Watershed District III	Yes, North Prairie Rural Watershed District III	The North Prairie Rural Watershed District System III is crossed by the southern end of the Project Route. However, BMPs will be used to minimize potential impacts to surface and ground water.

Table 5-2. Avoidance Areas

Avoidance Area	Present within One-mile Study Area	Present within Project Corridor	Crossed by Project Route	Proposed Buffer
Irrigated land	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.
Areas of recreational significance that are not designated as exclusion areas	No	No	No	No buffer is proposed because no features are identified within the Project Corridor.

1 Approximately 6.1 miles of corridor was not surveyed because of restricted access or wetlands. Based upon a review of the Project documentation, SHPO determined that a Class III cultural field survey was not warranted for these remaining areas.

5.3 Selection Criteria

In accordance with NDAC § 69-06-08-02(3), "a corridor or route shall be designated only when it is demonstrated to the Commission by the applicant that any significant adverse effects resulting from the location, construction, and maintenance of the route, as they relate to the following, will be at an acceptable minimum or that those effects will be managed and maintained at an acceptable minimum." **Table 5-3** identifies the selection criteria effect to be considered for the Project Corridor and Project Route. Certain resources relevant to selection criteria (wetlands and wooded areas) are shown on **Figures 4 through 6** and the sheet maps **in Appendix B**.

Table 5-3. Selection Criteria

Selection Criteria	Potential Adverse Effects	Application Section
The impact upon agriculture:		
Agricultural production	Approximately 83 percent of the Project Corridor is agricultural land (cultivated or hay/pasture), and areas within the construction easement may be disturbed during field surveys and construction. Disturbed areas will be restored as practicable and landowners will be compensated through an easement payment and for loss of agricultural production. The proposal of removing existing H-frame structures and replacing them with single pole structures will lessen the impact to agricultural production compared with the existing condition. Removing the existing 115 kV transmission line and replacing it with single pole steel structures as a double circuit with the 230 kV line will result in 74 fewer poles.	6.1
Family farms and ranches	Areas within the construction easement may be disturbed during field surveys and construction, but will be restored as practicable and landowners will be compensated through an easement payment and for loss of agricultural production. Consolidation with an existing line means that a new line will not be built across family farms and ranches.	6.1

Table 5-3. Selection Criteria

Selection Criteria	Potential Adverse Effects	Application Section
Land that the owner can demonstrate has soil, topography, drainage, and an available water supply that cause the land to be economically suitable for irrigation	The Project Corridor and ROW is primarily cropland and grassland. No irrigated lands were identified within the Project Corridor or ROW.	6.1
Surface drainage patterns and groundwater flow patterns.	A desktop wetland and waterway review was conducted for the Project Corridor, a field wetland delineation of the proposed Magic City Substation site was conducted in August 2016, and a field wetland delineation of the existing McHenry Substation site was conducted in September and November 2016 (**Appendix D).** The Project will be built to avoid impacts to surface waters to the extent practicable. Temporarily disturbed areas will be returned to their original contours, and no impact to surface or groundwater flow patterns are anticipated.	6.3, 6.4
The impact upon:		
Sound-sensitive land uses	Following construction, a minimal amount of sound from the transmission line will occur as a result of corona effects. Corona effects occur when air molecules near conducting wire are ionized due to changes in the electric field intensity at the conductor surface. The noise is most noticeable when conductors are wet as a result of precipitation. In 2013, U.S. Department of Agriculture Rural Utilities Service (RUS) conducted noise modeling of a 230 kV transmission line that estimated the audible corona to be 15 A-weighted decibels (dBA) in fair weather and 25 to 40 dBA in wet weather at the edges of the ROW (RUS 2013). These sound levels are well below normal ambient outdoor levels. Six residences are located within 500 feet of the Project Route, and temporary noise impacts may occur during construction. Xcel Energy has obtained written waivers from the owners of the six residences located within 500 feet of the Project Route.	6.12
The visual effect on the adjacent area	The Project will be visible to landowners and travelers along roadways adjacent to the Project Corridor. Other high-voltage transmission lines, including the existing 115 kV transmission line, electric distribution lines, and radio towers are present in the viewshed. Although the new structures will range between approximately 15 to 33 feet taller than the existing H-frame structures. Consolidation with an existing line means that a new line will not be built thus minimizing aesthetic impact in the Project Corridor and ROW.	6.9
Extractive and storage resources	Xcel Energy reviewed maps of economically mineable coal available from the North Dakota Geological Survey (NDGS 2016), and based upon these maps, no economically mineable coal is present within the Project area. In addition, Xcel Energy reviewed the North Dakota Department of Mineral Resources Oil and Gas interactive web mapper (NDDMR 2016) and determined that no oil and gas mines are located within the Project area. Xcel Energy is not aware of any current or planned oil and gas extraction within the Project Corridor or ROW.	8.12

Table 5-3. Selection Criteria

Selection Criteria	Potential Adverse Effects	Application Section
Wetlands, woodlands, and wooded areas	A desktop wetland and waterway review was conducted for the Project Corridor, a field wetland delineation of the proposed Magic City Substation site was conducted in August 2016, and a field delineation of the McHenry Substation site was conducted in September and November 2016 (**Appendix D**). The Project will be built to avoid impacts to surface waters to the extent practicable. According to National Land Cover Data, approximately 6 percent of the Project Corridor contains wetlands or open water. However, permanent impacts to jurisdictional wetlands will be minimized as practicable, with an anticipated approximate net impact of 629 square feet of wetlands impacted by the Project Route. Impacts to jurisdictional wetlands at the McHenry Substation site will be addressed by GRE and a mitigation plan between GRE and the U.S. Army Corps of Engineers (USACE). Economically important forestry resources are not present in the Project Corridor. A few small patches of trees are present as shelterbelts and in drainageways and wetlands. The most prevalent area of forest is the Souris River valley.	6.2, 6.4
Radio and television reception, and other communication or electronic control facilities	Tall structures such as buildings, communication towers, transmission lines, and wind turbines can create minor obstructions to nearby communications systems. Based on the low density of airwave receptors and the relatively small obstruction of utility poles, television reception disruption and disturbances to global positioning system (GPS) and other farm-related location systems are not anticipated.	6.12
Human health and safety	The Project will be designed and constructed to meet or exceed the standards of the National Electrical Safety Code (NESC). Regular maintenance and inspections will be performed during the life of the Project to ensure its continued integrity. Safety precautions will be taken during construction and line installation. No impacts on human health and safety are anticipated from the Project.	6.11
Animal health and safety	Construction work will be coordinated with landowners to avoid impacts to livestock. Xcel will implement measures to avoid and minimize impacts to wildlife by using bird diverters and avoiding wetlands and other habitat to the extent practicable.	6.5, 6.6, 6.11
Plant life	Xcel Energy will avoid existing trees and shrubs as practicable. If impacts to trees and shrubs cannot be avoided, the individual trees/shrubs will be replaced according to the Commission's tree and shrub mitigation specifications. Temporarily disturbed areas will be reseeded. Temporarily disturbed areas will be reseeded and reclaimed to as near as practicable to pre-construction conditions in accordance with Natural Resources Conservation Service (NRCS) recommendations, unless otherwise specified by the landowner. A total of approximately 3.2 acres forested land will be cleared along the Souris River, and less than 0.2 acres of permanent impacts will occur from poles located in non-agricultural lands. **Table 6-2** shows the percentage of land cover types within the Project Corridor.	6.2

5.4 Policy Criteria

In accordance with NDAC § 69-06-08-02(4), "the Commission may give preference to an applicant that will maximize benefits that result from the adoption of the following policies and practices, and in a proper case may require the adoption of such policies and practices. The Commission may also give preference to an applicant that will maximize interstate benefits." **Table 5-4** summarizes these policy criteria for the Project Corridor and Project Route.

Table 5-4. Policy Criteria

Policy Criteria	Suitable Policy or Xcel Energy Practice	Application Section
Location and design	The Project proposal of double circuiting with an existing transmission line minimizes impacts from a new transmission line. Xcel Energy has committed to minimizing and mitigating environmental impacts, following the NESC requirements and policies, designing the system to efficiently transfer electricity, ensuring worker and public health and safety, and constructing facilities to most effectively and efficiently meet its delivery obligations.	1.0, 3.0
Training and utilization of available labor in this state for the general and specialized skills required	Xcel Energy will use local qualified contractors to provide labor for the Project to the extent practicable based on available qualified personnel.	6.13
Economies of construction and operation	Xcel Energy will use experienced local qualified contractors to the extent practicable based on available qualified local personnel. Xcel Energy has evaluated feasible alternatives and selected a Project Route that minimizes the extent and impacts to the social, economic, and natural environment to the extent practicable.	5.6
Use of citizen coordinating committees	No citizen coordinating committees were used for the Project Route or Project Corridor. However, an open house was held in December 2015 that included discussion of the Project Route and resulted in Xcel Energy's decision to construct the Project as a double circuit on single steel poles. Xcel Energy has worked with landowners to avoid or minimize impacts on landowners to the extent practicable.	3.3
A commitment of a portion of the transmitted product for use in this state	The Project will transmit energy from the McHenry Substation in McHenry County to the proposed Magic City Substation in Ward County. The energy will be used to serve the Minot area.	1.0
Labor relations	No labor relations will be affected by the Project.	6.13
The coordination of facilities	Xcel Energy will interconnect with the existing McHenry Substation, the proposed Magic City Substation, and a new 230/115 kV double circuit transmission line will replace the existing 115 kV transmission line. The proposed interconnections with the substations and replacement of the existing 115 kV transmission line will occur in a manner that provides continuous, uninterrupted electrical service in the Project area throughout the construction process.	1.0, 3.0, 4.0
Monitoring of impacts	Construction crews will employ prudent utility BMPs during construction to monitor soil impacts and segregate topsoil, as required by any applicable permits. A construction SWPPP will be prepared for the Project. Weekly monitoring of permit and environmental compliance will be conducted.	3.7

Table 5-4. Policy Criteria

Policy Criteria	Suitable Policy or Xcel Energy Practice	Application Section
Utilization of existing and proposed rights-of-way and corridors	Xcel Energy's proposed Route for the new transmission line parallels an existing 115 kV transmission line for approximately 74 percent of its total length (16.0 of the 21.7 total miles of transmission line to be constructed).	1.0, 3.0
Other existing or proposed transmission facilities	Xcel Energy's proposed Route utilizes an existing utility ROW for approximately 74 percent of its total length (16.0 of the 21.7 total miles of transmission line to be constructed).	1.0, 3.0

Xcel Energy's Corporate Responsibility Report (Xcel 2015), states that Xcel Energy believes in an environmental policy and management approach that balances costs and environmental benefits while maintaining a reliable utility system. Xcel Energy pursues proactive emission reduction and clean energy strategies that improve the environment, control costs, and meet the interests of their communities. Xcel Energy regularly engages in discussions with policymakers, regulators, energy providers, the environmental community, and customers regarding environmental issues. Xcel Energy's 2015 Corporate Responsibility Report, the most recent Corporate Responsibility Report published as of the writing of this Application, is available online[9].

5.5 Design and Construction Limitations

As described in **Section 3.3**, the locations of the proposed 230/115 kV transmission line and the proposed Magic City Substation were determined based upon available land in the area near the existing utility corridor of the McHenry Substation and the existing 115 kV transmission line. Xcel Energy further refined the location of the Project Corridor by identifying interested landowners in the area near the existing utility corridor to construct the new substation. Based upon these factors, Xcel Energy chose the Project Route. The Project Route was chosen because it follows the existing utility ROW for the majority of its length and the substation location was chosen due to its proximity to the existing transmission line. Pursuant to NDAC § 69-06-05-01(2)(j), the proposed location of the Project is the most direct route that also minimizes impacts on the exclusion, avoidance, selection, and policy criteria identified in NDAC § 69-06-08-02. In the evaluation of the Study Area, Xcel Energy also considered topography, location of existing transmission facilities (lines and substations), land ownership, and economics.

[9] Xcel Energy's 2015 Corporate Responsibility Report is available online at https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Corporate%20Responsibility%20Report/2015-Corporate-Responsibilty-Report.pdf

5.6 Economic Considerations

Several economic factors were considered in deciding where to route the Project (NDAC § 69-06-05-01(2)(j)). Overall, minimizing the length decreases the cost to construct the 230 kV transmission line because less ROW and fewer materials need to be acquired. Fewer landowner easements need to be obtained for the shorter Project Route. Minimizing the length also reduces energy loss due to standard transmission inefficiencies.

Xcel Energy has and will continue to take steps to minimize any economic impact that might result from the proposed facility. Landowners will be compensated through an easement payment for any potential loss of land and agricultural production. The Project Route was chosen to follow as straight a line as possible with consideration given to willing landowner participation, constructability, exclusion areas, avoidance areas, and other selected areas. Short-term economic benefits will be derived from the construction of the Project. During construction local businesses will see economic gains from spending by construction crews on lodging, meals, and other goods and services. Long-term economic benefits from the Project will include incremental increases in revenues to local taxing jurisdictions from utility property taxes.

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6.0 ENVIRONMENTAL ANALYSIS

This section provides a summary of the existing conditions, potential impacts, and mitigation measures (if any) for various environmental resources that are present within the Project Corridor and Project Route. The existing conditions and potential impacts are based in part upon desktop analysis using the best and most current publicly available data. In addition, a raptor and habitat field survey of the Project Corridor, field wetland delineation of the Magic City Substation site, field wetland delineation of the McHenry Substation property, and a Class III Cultural Resource Inventory of the Project Corridor and Magic City Substation site were conducted. GRE and their consultant reviewed cultural resources for the McHenry Substation site expansion, and determined there are no recorded cultural resources within the property.

In general, impacts to all resources will be minimized by consolidating the new transmission line with the existing transmission line on double circuit single pole structures. The use of single-pole structures and removal of existing H-frame structures are taken into consideration when addressing the potential impacts and mitigation measures of each resource discussed below.

6.1 Land Use

6.1.1 Existing Conditions

General Land Use

The Project is located within McHenry and Ward counties and in an agricultural area consisting of rural farmsteads, pothole wetlands, and areas of native and restored prairie. The Project Corridor includes approximately 710 acres of agricultural fields and hay/pasture lands. NLCD land cover types located within the Project Corridor are shown in **Section 6.2** of this document. The majority of the Project ROW (16.0 miles) shares corridor with the existing 115 kV transmission line ROW and consists primarily of agricultural land. The 75-foot-wide existing 115 kV transmission line ROW will overlap the 125-foot-wide Project ROW by 37.5 feet, requiring an additional 87.5 feet of new ROW (**Figure 2**). The approximately 1.2 miles of new transmission line ROW required to connect the 230/115 kV transmission line to the proposed Magic City Substation and the approximately 4.2 miles of new transmission line ROW of the North Prairie Township reroute cross agricultural fields. The proposed Magic City Substation will be located within an agricultural field. Double circuiting the 230/115 kV transmission lines and removing the existing 115 kV H-frame structures minimizes the impact to agricultural land.

Six residences are located within 500 feet of the Project centerline. No schools are located within the Project ROW. The closest school to the Project is Velva Public School, which is approximately 1.7 miles southwest of the Project ROW. No designated recreational sites are crossed by or located near the Project ROW. No communication towers are located within the Project ROW.

The Project Corridor does not cross any federal lands (BLM 2011), national or state parks or designated recreation areas, or any state Land and Water Conservation Fund lands. The Project crosses two snowmobile trails, although no impacts to these trails are anticipated.

Within Ward County, the Project ROW is located entirely within the A-1 Agricultural District. The Ward County Zoning Ordinance does not list any restrictions for utility lines, transmission lines, or substations. McHenry County zoning maps are not publicly available, although the McHenry County Auditor confirmed in a conversation on November 18, 2016 (McHenry County 2016) that the entire Project is located within the Agricultural District and that transmission lines are a permitted use within this district.

Prime Farmland

Prime farmland, as designated by the NRCS, is crossed by the Project. Prime farmland, prime farmland if drained, and farmland of statewide importance are shown on **Figure 4**. The Project Corridor crosses approximately 460.1 acres of prime farmland, 96.5 acres of prime farmland when drained, and 20.6 acres of farmland of statewide importance. The proposed Magic City Substation encompasses approximately 10.0 acres of prime farmland, 0.0 acre of prime farmland when drained, and 0.0 acre of farmland of statewide importance. The expansion of the McHenry Substation for the 230/115 kV connection encompasses approximately 2.8 acres of prime farmland, 0.0 acres of prime farmland when drained, and 0.0 acres of farmland of statewide importance.

6.1.2 Potential Impacts

General Land Use

Land use in and adjacent to the Project Corridor is not expected to be significantly impacted as a result of construction, operation, or maintenance of the Project.

Temporary impacts within the existing transmission line ROW will occur during construction. Construction access to the structure locations will be via overland access, and along the edge of adjacent roads and agricultural fields. Access will generally require little or no grading or vegetation clearing and consists of driving equipment across land from the nearest public road, field road, or private driveway.

Temporary impacts include:

- Construction/removal area at each new transmission and existing H-frame structure location, approximately 0.2 acre per structure (up to 86 acres for the entire Project)
- Use of approximately 10 acres within a 40 acre parcel of a previously disturbed gravel pit north of the Souris River as a staging area (preliminary staging location)
- Use of approximately 10 acres of the approximately 50 acre at the Magic City Substation site as a temporary staging area

If additional staging areas are identified, Xcel Energy will conduct any required field surveys and obtain any necessary permits prior to use. Areas of temporary disturbance will be revegetated in nonagricultural areas and returned to pre-existing conditions after construction.

Permanent impacts will be minimized by constructing the Project primarily adjacent to or within an existing transmission line ROW, and by removing the existing H-frame structures and returning the land at existing structures to the surrounding land use. The proposed 10-acre Magic City Substation will be developed for the Project, as well as the approximate 1.2-mile-long segment of new ROW required to connect the substation to the new double circuit transmission line. Grading will be required at the Magic City Substation site and McHenry Substation expansion.

No residences are located within the Project ROW or Project Corridor. Xcel Energy has obtained written waivers from the owners of six residences located within 500 feet of the Project Route. While the transmission line is in operation, landowners with properties that are crossed by the Project will be permitted to continue using their land in the same manner as they currently do, although height restrictions (similar to those currently in place for the existing transmission line) concerning the use of tall equipment under the new transmission line will apply.

With the exception of the expanded ROW, proposed Magic City Substation, expanded McHenry Substation, the 1.2-mile segment of new transmission line ROW, and 4.2-mile segment of the North Prairie Township reroute, the land use will not be changed for the majority of the Project. In addition, Xcel Energy will continue to maintain open communication with all counties, cities, townships, and landowners throughout the course of the permitting process to ensure that community values set forth in land use and zoning plans are considered. Direct impacts to the Project area's community values will be minimized to the greatest extent feasible. Any impacts to land use resulting from the Project will be further reduced by implementing the mitigation measures described below.

Prime Farmland

Agriculture is the principal land use within the Project area, and the majority of land within or adjacent to the ROW could still be used for agricultural following construction. Temporary impacts to prime farmland and farmland of statewide importance will be minimal and will be limited to the access routes and disturbance around the foundation of each structure. Construction and operation of the transmission line will not interfere with continued use of the surrounding areas for agricultural uses. Overall impacts to agricultural land will be minimized by consolidating the new line with an existing one and utilizing single pole structures instead of the existing two-pole structures.

During construction, temporary impacts such as soil compaction and crop damage may occur in a small area around each structure and along access routes. Temporary impacts to agricultural lands and areas of prime farmland may also occur at the staging and laydown areas. Xcel Energy estimates that the temporary impacts in areas of prime farmland, prime farmland if drained, and farmland of statewide importance will be 0.2 acre per structure for construction. Xcel Energy estimates temporary impacts of approximately 26.2 acres (131 structures) to classified prime farmland, 6.4 acres (32 structures) of classified prime farmland if drained, and 1.0 acre

(2 structures) of farmland of statewide importance will be temporarily impacted by transmission line construction.

The Project Corridor includes approximately 460.1 acres of prime farmland, 96.5 acres of prime farmland if drained, and 20.6 acres of farmland of statewide importance. However, permanent impacts to prime farmland will be limited to the location of structures, the proposed Magic City Substation, and the McHenry Substation expansion. Net impacts to prime farmland and prime farmland if drained will increase as a result of the Project, while impacts to farmland of statewide importance will decrease slightly. **Table 6-1** summarizes the anticipated permanent impacts to prime farmland and farmland of statewide importance. The number of transmission structures located in important farmland was determined based on preliminary engineering for the Project. No permanent access routes will be constructed on prime farmland or farmland of statewide importance.

The Magic City Substation will be constructed on a 50-acre parcel which contains approximately 41.5 acres of prime farmland and 8.5 acres of prime farmland if drained. Approximately 10.0 acres of prime farmland will be converted to a fenced substation area and 40.0 acres will be planted to prairie grass after construction is completed. At the McHenry Substation site, the existing gravel pad will be expanded by approximately 1.4 acres for the Project, all of which is located within prime farmland.

Table 6-1. Permanent Impacts to Prime Farmland, Prime Farmland if Drained, and Farmland of Statewide Importance

Facility	Prime Farmland		Prime Farmland if Drained		Farmland of Statewide Importance	
	Poles	**Area**	**Poles**	**Area**	**Poles**	**Area**
Existing 115 kV Transmission Line[1]	170 poles	2,040 square feet (0.05 acre)	8 poles	96 square feet (0.002 acre)	24 poles	288 square feet (0.01 acre)
Proposed 115/230 kV Transmission Line[2]	131 poles	4,632 square feet (0.11 acre)	32 poles	1,217 square feet (0.02 acre)	5 poles	276 square feet (0.01 acre)
Magic City Substation	Not Applicable	435,600 square feet (10.0 acres)	Not Applicable	0 square feet	Not Applicable	0 square feet
McHenry Substation[3]	Not Applicable	60,000 square feet (1.38 acres)	Not Applicable	0 square feet	Not Applicable	0 square feet
Net Impact	39 fewer poles, new and expanded substation	498,192 additional square feet (11.4 acres)	24 additional poles	1,121 additional square feet (0.03 acre)	19 fewer poles	12 fewer square feet (0.0001 acre less)

1 The existing transmission line makes use of wooden H-frame structures, which have two poles per structure. This table measures total existing permanent impacts based on two poles per structure.
2 The proposed single pole steel structures have a surface area of 78.5 or 19.6 square feet depending on the type of structure used at each specific location.
3 McHenry Substation expansion for Xcel Energy's Project will require 1.4 acres, however, additional expansion of the McHenry Substation for a separate GRE Project will occur independently of the Project.

Xcel Energy has consulted with the NRCS, and as confirmed in an email from the NRCS on December 7, 2016 that the NRCS acknowledges that the Project is excluded from the Farmland Protection Policy Act because no federal funding will be used for the Project. However, Xcel Energy has designed the Project to limit permanent impacts to prime farmland to the extent practicable. Correspondence with the NRCS is included in **Appendix C**.

Temporary and permanent impacts as described above will be minimized by implementing the mitigation measures listed below.

6.1.3 Mitigation

The Project will result in temporary and permanent impacts to general land use and agricultural operations. Xcel Energy has made an effort to avoid or minimize potential impacts to agricultural operations by constructing the double circuit transmission line and reducing the permanent footprint of the Project by removing the existing 115 kV H-frame structures. In addition, the following mitigation measures will be implemented to further reduce potential impacts to land use:

- Landowners will be compensated for use of their land through an easement payment. Xcel Energy will compensate landowners for any temporary impacts, including crop damage and soil compaction that may occur during construction.
- Soil compaction will be addressed by compensating the farmer to repair the ground or by using contractors to chisel-plow the site.
- In the event that Xcel Energy intercepts a tile line, Xcel Energy will relocate the transmission structure, if possible, and repair the tile line if it has been damaged.
- Xcel Energy will work with landowners to identify potential mitigation measures that could avoid or reduce Project-induced changes to farming practices, such as crop dusting.
- Access to all residences will be maintained during construction.
- Residents will be notified of construction activities prior to the start of construction.
- Nonagricultural disturbed areas will be reseeded according to landowner requests.
- Existing 115 kV H-frame structures will be removed and the disturbance re-contoured and revegetated.

6.2 Vegetation

6.2.1 Existing Conditions

The Project is located in the NRCS Northern Great Plains Spring Wheat Region Land Resource Region; the majority of the Project is located in the Northern Black Glaciated Plains Major Land Resource Area (MLRA) and a short segment at the southern end of the Project ROW located in the Central Black Glaciated Plains MLRA (NRCS 2006). These MLRAs are covered by glacial till plains, with glaciolacustrine deposits, kettle holes and moraines, as well as glacial lake plains. Mollisols are the dominant soil order in these MLRAs. Based upon these geologic and soil conditions, the Project area supports natural prairie vegetation, although the approximately three quarters of each of these MLRAs have been converted for use as private cropland (NRCS 2006).

The Project is located within the Level III Northern Glaciated Plains Ecoregion, and more specifically within the Level IV Northern Black Prairie and Drift Plains ecoregions. The Northern Glaciated Plains ecoregion is characterized by a flat to gently rolling landscape consisting of glacial drift and subhumid conditions that foster a grassland transitional between the tall and shortgrass prairie. Land cover within the Project Corridor, as identified by data obtained from the NLCD (MRLC 2011), is provided in **Table 6-2**.

Table 6-2. Land Cover Types within the Project Corridor

NLCD Land Cover Type	Acres within Project Corridor	Percentage of Total Area
Transmission Line Corridor		
Emergent Herbaceous and Woody Wetlands	45.3	5
Cultivated Crops	497.7	58
Developed, Open Space	44.7	5
Open Water	8.5	1
Hay/Pasture	155.8	18
Herbaceous	34.2	4
Deciduous Forest	0.4	<1
Developed, Low or Medium Intensity	3.7	<1
Evergreen Forest	0.3	<1
Subtotal	**790.6**	**92**
Magic City Substation		
Cultivated Crops	48.5	6
Developed, Open Space	1.5	<1
Subtotal	**50.0**	**6**
McHenry Substation		
Developed, Open Space	3.9	<1
Developed, Low or Medium Intensity	3.5	<1
Hay/Pasture	7.9	
Herbaceous	1.5	<1
Subtotal	**16.8**	**2**
PROJECT TOTAL	**857.4**	**100**

Source: MRLC (2011)

The percentages identified in **Table 6-2**, based upon NCLD data, are consistent with the land cover observed during field reconnaissance completed in August 2016.

Herbaceous vegetation, row crops, and pasture are predominant within the existing 115 kV ROW through agricultural fields and pasture lands. Woody vegetation has been almost entirely eliminated from the existing ROW. New ROW will consist primarily of agricultural land. The proposed Magic City Substation will be located within a cultivated agricultural field and the two temporary staging areas will be located within the disturbed portion of an existing gravel pit and at the proposed Magic City Substation site.

In addition to agriculture and native vegetation, noxious weeds may be present within and adjacent to the Project Corridor. To prevent the spread of these noxious weeds, NDCC § 4.1-47-02 states that, "Each person shall do all things necessary and proper to control the spread of noxious weeds." The North Dakota Department of Agriculture coordinates the efforts of county and city weed boards and state and federal land managers to implement integrated weed management programs, and McHenry and Ward Counties have Weed Control Boards to control the spread of noxious weeds within each county. The North Dakota State Noxious Weed list has 11 different weed species, and Ward County has 2 additional weeds on their noxious weed list. McHenry County does not have any listed noxious weeds in addition to the state list. **Table 6-3** lists the state and county designated noxious weeds.

Table 6-3. State and County Noxious Weeds

Common Name	Scientific Name	Designation (State or County)
Absinth wormwood	*Artemisia absinthium*	State
Canada thistle	*Cirsium arvense*	State
Dalmatian toadflax	*Linaria genistifolia*	State
Diffuse knapweed	*Centaurea diffusa*	State
Houndstongue	*Cynoglossum officinale*	Ward County
Leafy spurge	*Euphorbia esula*	State
Musk thistle	*Carduus nutans*	State
Purple loosestrife	*Lythrum salicaria*	State
Russian knapweed	*Acroptilon repens*	State
Saltcedar	*Tamarix* spp.	State
Scentless chamomile	*Anthemis arvensis*	Ward County
Spotted knapweed	*Centaurea maculosa*	State
Yellow toadflax	*Linaria vulgaris*	State

Source: North Dakota Department of Agriculture (2016), Ward County Noxious Weeds (2017)

6.2.2 Potential Impacts

Construction of the Project will involve excavation and grading in limited areas around each transmission structure, and the removal of the existing H-frame structures will temporarily disturb herbaceous vegetative cover. Impacts from operations and maintenance will be similar to those currently associated with the existing transmission line. The newly constructed transmission line will continue to be maintained in the manner in which the existing transmission line has been maintained (i.e., overhanging vegetation will be trimmed and the Project ROW will be periodically mowed or treated with herbicide in non-agricultural areas).

Equipment access has the potential to temporarily disturb vegetation. No permanent access routes and no permanent impacts resulting from the use of the temporary staging areas during construction will occur. If vegetation is disturbed by workers who are making use of overland access or are using the temporary laydown within the Project Corridor, Xcel Energy will revegetate

disturbed non-cultivated areas to pre-construction conditions. The long-term effects of these actions are not expected to result in measurable losses.

The Magic City Substation site is located in a cultivated agricultural field and will not result in any permanent impacts to vegetation. In forested areas, such as near the Souris River, only trees that interfere with safety and equipment operation will be removed. Tree clearing will be limited to forested areas within the proposed ROW. Access routes will be designed to avoid trees, but removal of a small number of trees may be necessary for access routes. (Sheet Maps 20 and 21, **Appendix B**).

Overall, impacts to vegetation are anticipated to be insignificant because the majority of the Project will be located within or adjacent to an existing utility ROW or on cultivated agricultural land. Permanent vegetation impacts will be primarily limited to the footprint of transmission structures in forested or non-cultivated land and tree clearing of forested areas within the proposed ROW. Tree clearing of such forested areas within the ROW will occur almost exclusively near the Souris River and has been estimated at approximately 3.2 acres.

Temporary effects during construction will result in areas of bare ground that could increase the potential for the spread of invasive plant species. Xcel Energy will implement appropriate protection measures to prevent the spread of invasive species during construction.

6.2.3 Mitigation

Impacts to existing vegetation communities caused by implementation and operation of the Project include both direct and indirect temporary and permanent impacts. The following mitigation measures will be implemented to reduce potential impacts to vegetation:

- After the ROW is established, it is typical to control and manage vegetation using mechanical and herbicide treatments following a prescribed management plan. Vegetation that does not interfere with the safe operation of the transmission line will be allowed to establish within the 125-foot ROW.
- When necessary, non-agricultural areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a seed mix agreed to by the landowner.
- Xcel Energy will attempt to avoid, minimize, and/or mitigate impacts to any areas known to support native vegetation or special status species, as practicable. When native vegetation communities cannot feasibly be spanned, Xcel Energy will minimize the number of structures within these communities.
- As required by the North Dakota Construction Stormwater General Permit NDR10-0000, vegetation monitoring will take place until 70 percent (or greater if requested by the landowner) of the original cover is attained or applicable permit conditions are otherwise satisfied.

- Xcel Energy will incorporate a tree replacement policy based on the Commission's tree and shrub mitigation guidelines.
- The use of seed mixes with no viable noxious weeds will be used to prevent and reduce the spread of noxious weeds, as well as the use of standard construction BMPs such as avoidance of infested areas, removal or control of small populations of noxious weeds, cleaning construction equipment before leaving an area infested with noxious weed species, or cleaning equipment prior to accessing uninfested areas.

6.3 Floodplains

6.3.1 Existing Conditions

Federal Emergency Management Agency (FEMA) floodplain data were reviewed to identify floodplains crossed by the Project. Digital FEMA floodplain data were available for McHenry County but not publicly available for Ward County.

According to the publically available FEMA floodplain data, the Project centerline crosses one designated floodway and floodplain associated with the Souris River, located in Sections 13 and 24 of Township 153 North, 80 West in McHenry County, North Dakota. The centerline will cross the regulatory floodway, 100-year floodplain, and 500-year floodplain. The total length of floodplain crossed is approximately 0.7 mile (3,850 feet) wide.

6.3.2 Potential Impacts

Based on preliminary design, the Project will result in three structures being placed in the floodway and three structures within the 100-year floodplain. No structures will be placed within the 500-year floodplain. Disturbance within floodplains will be limited to the area needed for the new structures and access routes. Structures will result in up to 236 square feet (0.005 acre) of permanent disturbance within the floodway and 177 square feet (0.004 acre) of permanent disturbance within the 100-year floodplain (up to 79 square feet or approximately 0.002 acre of permanent impact per structure). The location of the floodplain crossing is shown on **Figure 6**.

During construction, ground cover and soils will be temporarily disturbed. Effects resulting from the removal of groundcover and soils in floodplains will be temporary in nature and the area not occupied by the transmission structures will be reclaimed and revegetated to pre-construction conditions. Potential floodwater displacement could occur where structures are placed in the floodway and floodplains. Based on the low volume of potential floodwater displacement, impacts on flooding are not anticipated.

The existing 115 kV transmission line has three H-frame structures (six poles) located within the floodway and two H-frame structures (four poles) located in the 100-year floodplain. The new double-circuit transmission line would result in three single pole structures in the floodway and two within the floodplain. Once the new transmission line is energized the existing 115 kV will be removed from their current location within floodplain and floodway. The disturbed area associated

with the removal of the existing structures will be revegetated and graded to pre-construction conditions so that water flow is not impeded during flooding events. NDCC § 61-16.2-14 requires that the community responsible for permitting or authorizing a use in a regulatory floodway, in this case McHenry County, notify the State Engineer of the proposed use before issuing the permit or authorization. The State National Flood Insurance Program (NFIP) Coordinator, Office of the State Engineer requested that Xcel Energy provide calculations to determine whether the conveyance of floodwaters would be reduced by the Project. The Application for the State Engineer's Floodway Review, floodwater conveyance calculations, and No-Rise certificate were completed using guidance from the NFIP Coordinator and submitted to McHenry County on March 1, 2017. The County has forwarded these documents to the NFIP Coordinator for review. Results of the floodwater conveyance calculations show that flood conveyance would not be reduced by the Project.

Based on preliminary engineering, construction of the Project will require temporary overland access within the floodway, the 100-year floodplain, and the 500-year floodplain. The use of temporary overland access will not require improvement, earthwork, or gravel amendments. As a result, no impacts to floodplains from the use of or construction of overland access are anticipated.

With implementation of the mitigation measures described below, it is not anticipated that construction of the Project will result in significant effects on floodplains. It is anticipated that operations and maintenance of the Project will have similar effects as the existing transmission line.

6.3.3 Mitigation

Structures in the FEMA floodway and 100-year floodplain will displace water storage volume within the floodplain. However, based on the low volume of potential floodwater displacement, the structures are not anticipated to have an effect on flooding. Despite the minimal anticipated impacts to floodplains, the following mitigation measures will be employed to further reduce potential impacts to floodplains:

- Xcel Energy will coordinate with the USACE and North Dakota State Water Commission (NDSWC) to identify a final appropriate structure placement in floodway, 100-year, and 500-year floodplains.
- Xcel Energy will follow all floodway development requirements as outlined in the Ward County Floodplain Ordinance and the McHenry County Zoning Regulations.
- Xcel Energy will remove all excavated soil from the floodplain and restore temporary ground disturbance within the floodway, 100-year, and 500-year floodplains caused by construction activities by revegetating the disturbed area.

6.4 Wetlands and Other Waters of the U.S.

6.4.1 Existing Conditions

Xcel Energy identified wetlands that could be impacted by the Project using desktop review and field wetland delineations. Xcel Energy conducted field wetland delineations for the 50-acre Magic City Substation site. The delineations were conducted using the methodologies cited in the USACE Jurisdictional Determination Form Instruction Guidebook (USACE and EPA 2007), including the revised Rapanos guidance dated December 2, 2008 (EPA and USACE 2008). Three farmed wetlands were delineated within the Magic City Substation site. These wetlands are low areas within the farmed field that are tilled and planted in non-wet years. Wetland-1 and Wetland-2 appear to be nonrelatively permanent waters that are formed by geomorphic position, are isolated from jurisdictional waters, and appear to be isolated from any navigable water. Wetland-3 is a depressional wetland along a road ditch and may have surface connectivity to a wetland complex to the east, which is connected to an unnamed tributary of the Souris River. As a result, Wetland-3 may be considered a water of the U.S. by the USACE because of connectivity. Delineated wetlands will be avoided. A wetland delineation report for the Magic City Substation site is included in **Appendix D.**

A field wetland delineation was conducted for the McHenry Substation and is included in **Appendix D**. The expansion of the McHenry Substation will impact two wetlands (Wetlands 1, 4a and 4b). USACE provided jurisdictional determinations; 1) A preliminary jurisdiction determination indicates that Wetland 1 is isolated and not under USACE jurisdiction; 2) however, an Approved Jurisdictional Determination indicates that Wetland 4a and 4b is under USACE jurisdiction. GRE will work with the USACE on the required permits and mitigation for the wetland listed under Item 2.

For the remainder of the Project Corridor, the locations of wetlands were determined through a desktop review using a review of historic aerial photography and hydric soil maps, in accordance with guidance provided by the USACE.

Prior to beginning the desktop review, the USACE North Dakota Regulatory office was contacted to review and provide input on the desktop wetland delineation methods that were proposed for the Project. The desktop review methods included using location information, climate data, topography, soil data, and aerial photography. USACE concurred with the desktop methods as described and also agreed that desktop wetland delineation was appropriate for this type of project (USACE 2016).

Background information from government agencies and private sources, where available, were collected and reviewed as a part of the desktop wetland review. The documents reviewed included:

- U.S. Geologic Service 7.5-Minute Topographic Quadrangle Maps for Surrey, Sawyer NE, and Velva North Dakota (USGS 2016)
- Web Soil Survey of McHenry and Ward Counties, North Dakota, http://websoilsurvey.nrcs.usda.gov (USDA/NRCS 2016)
- Hydric Soils List for McHenry and Ward Counties, North Dakota (USDA/NRCS 2016)
- Aerial Imagery for McHenry and Ward Counties, North Dakota (2003, 2006, 2009, 2010, 2012, 2014, 2015, 2015 LiDAR (Xcel Energy provided imagery), and 2016)
- National Wetland Inventory GIS data, USFWS, website accessed on May 29, 2015

The desktop analysis of the remainder of the Project Corridor identified 148 wetlands and 3 stream crossings within the Project Corridor. The wetland delineation reports for the Magic City Substation Site and McHenry Substation property and the results of the desktop wetland determinations are included in **Appendix D.**

6.4.2 Potential Impacts

One hundred forty-eight wetlands were identified within the Project ROW during the wetland delineation and desktop determinations, as shown on the sheet maps in **Appendix B**. Xcel Energy designed the Project to avoid and minimize permanent impacts to wetlands. The proposed Magic City Substation was designed to avoid impacts to the field delineated wetlands (Sheet Map 1 in **Appendix B**). While 53 new structures will be located within delineated or assumed wetlands, approximately 72 existing poles will be removed from wetlands. The new poles are bigger than the existing poles (78.5 or 19.6 square feet per structure) therefore, despite there being fewer poles in wetlands, approximately 0.01 acre of net permanent wetland impacts occur as a result of the Transmission Line. The expansion of the existing McHenry Substation will impact approximately 13,068 square feet (0.3 acre) field delineated wetlands. Of the McHenry Substation expansion wetlands impacted, approximately 2,614 square feet (0.06 acre) are non-jurisdiction field delineated wetlands and 10,454 square feet (0.24 acre) are USACE jurisdictional wetlands. GRE will work on a mitigation plan with the USACE and other responsible agencies for the remaining 10,454 square feet (0.24 acre) of jurisdictional wetlands impacted by the McHenry Substation expansion. **Table 6-4** shows the new, existing, and net impacts to wetlands as a result of the Project.

Table 6-4. Permanent Impacts to Wetlands

Facility	Emergent Wetlands		Scrub/Shrub Wetlands		Forested Wetlands	
	Poles	Area	Poles	Area	Poles	Area
Existing Transmission Line[1]	72 poles	1,413 square feet (0.03 acre)	0 poles	0 square feet (0.00 acre)	0 poles	0 square feet (0.00 acre)
Proposed Transmission Line[2]	50 poles	1,806 square feet (0.04 acre)	0 poles	0 square feet (0.00 acre)	3 poles	236 square feet (0.005 acre)
Magic City Substation	Not Applicable	0 square feet	Not Applicable	0 square feet	Not Applicable	0 square feet
McHenry Substation	Not Applicable	13,068 square feet (0.3 acre)	Not Applicable	0 square feet	Not Applicable	0 square feet
Net Impact	22 fewer poles, McHenry Substation Expansion	13,464 additional square feet (0.31 acre)	0 additional poles	0 additional square feet (0.00 acre)	3 additional poles	236 additional square feet (0.005 acre)

1 The existing transmission line makes use of wooden H-frame structures, which have two poles per structure. This table measures total existing permanent impacts based on two poles per structure.
2 The proposed single pole steel structures have a surface area of 78.5 or 19.6 square feet depending on the type of structure used at each specific location.
3 Wetland impacts at the McHenry Substation include 2,614 square feet (0.06 acre) of non-jurisdictional wetlands and 10,454 square feet (0.24 acre) of jurisdictional wetlands, for a total of 13,068 square feet (0.30 acre) of wetland impacts. These wetland impacts will be mitigated by GRE.

Xcel Energy anticipates that approximately 3.2 acres of forested wetland associated with the Souris River will be cleared within the new 125-foot-wide ROW. Where access routes cannot avoid forested wetlands, such as in the Souris River Valley, trees will need to be removed to provide access. Areas of forested wetland that are anticipated to be impacted by the Project are shown on Sheet Maps 20 and 21 in **Appendix B**. After construction, vegetation maintenance procedures will be implemented under transmission lines to prohibit the establishment of new trees.

Xcel Energy anticipates that all streams and other surface waterway features will be spanned. Therefore, no permanent impacts are anticipated to waterways.

6.4.3 Mitigation

Impacts to streams will be avoided and minimized by implementing appropriate sediment control practices and BMPs. These practices will be detailed in the National Pollution Discharge Elimination System (NPDES) permit and the Erosion Control Plan that will be completed prior to the start of construction. Post-construction, there will be no significant impact on surface water quality because wetland impacts will be minimized and mitigated, disturbed soil will be restored to pre-existing conditions, and the amount of land area converted to impervious surface will be small. Permanent impacts to wetlands will occur if structures are placed in a wetland within the 125-foot ROW. The following mitigative measures will be taken regarding wetland impacts from the Project:

- Xcel Energy will obtain the necessary permits from the USACE, State of North Dakota, and local governments for impacts on wetlands, streams, or other waterbodies.
- Xcel Energy will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to the NPDES permit requirements.
- Xcel Energy will install temporary safety fencing during construction to mark wetland boundaries within the Magic City Substation site.
- Wetland construction techniques may include timing wetland construction to occur during dry or frozen conditions, construction of ice roads and the use of low ground pressure equipment and/or construction matting materials to minimize soil and vegetation disturbances.
- GRE will work with the USACE to obtain the required permits and mitigation for the wetland impacted on the GRE-owned McHenry Substation property.

6.5 Threatened and Endangered Species and Critical Habitat

6.5.1 Existing Conditions

Federally listed species were discussed with the USFWS at a meeting on June 15, 2016. County lists from the USFWS were also used to determine which protected species have the potential to occur within the Project counties. According to the county lists, McHenry and Ward counties may potentially contain suitable habitat for, or have known occurrences of six federally listed threatened or endangered species. These species include the endangered whooping crane (*Grus Americana*), endangered gray wolf (*Canis lupus*), threatened piping plover (*Charadrius melodus*), threatened Dakota skipper (*Hesperia dacotae*), threatened rufa red knot (*Calidris canutus rufa*), and threatened northern long-eared bat (*Myotis septentrionalis*). One candidate species that was previously on the North Dakota County Lists in McHenry and Ward counties, Sprague's pipit (*Anthus spragueii*), was removed from its listed status as a candidate species on April 5, 2016. In addition, the USFWS commented in a meeting on June 15, 2016, that this species does not need to be included in this analysis (USFWS 2016).

In addition to these species, designated critical habitat for the piping plover occurs within McHenry and Ward counties, and designated critical habitat for the Dakota skipper occurs within Ward County. No impacts to shorelines are anticipated by the Project, so crossing piping plover habitat is unlikely. However, the Dakota skipper can potentially occur within native prairie, which is present within the Project Corridor.

On August 30, 2016, AECOM conducted field surveys for potential Dakota skipper habitat. Nine areas of potential habitat were surveyed along the Project Corridor. Three were given a moderate quality remnant prairie determination and six were given a low quality remnant prairie determination. The moderate quality habitats had some native plant species, but also invasive species and disturbances adjacent to the area. The low quality habitats consisted most of invasive species and highly disturbed areas. According to the trained field biologists, neither the moderate

or low quality habitats exhibited the characteristics and plant species diversity necessary to be classified as Dakota skipper habitat. A summary of these findings are included in the *Raptor and Habitat Survey Report for the Magic City Substation to McHenry Substation 230 kV Transmission Line Project* report included in **Appendix E**.

A desktop review was conducted of the 4.2-mile North Prairie Township reroute since the reroute was identified after the 2016 field season was over (**Appendix E**). An approximately 1,100 foot long grassland area is crossed by the reroute. A review of historical aerial photography indicated that the area had been hayed and used for pasture. In order to determine if this was a possible remnant prairie, Xcel Energy contacted the landowner on February 21, 2017 to find out more about the historic use of the area. The landowner stated that the area had been cultivated in the past and that, since there is a ditch present, the area has been seeded to grass for grazing horses. Based on this information, the area is not likely to provide suitable habitat for the Dakota skipper**.**

6.5.2 Potential Impacts

Table 6-5 below lists the federally listed species that potentially occur within the Project area, as well as potential impacts to the species or their habitat from the Project.

Table 6-5. Federally Listed Species with Potential to Occur in the Project Area

Species	Status[1]	Habitat	Potential for Occurrence in Project Corridor and Route
Insects			
Dakota skipper[2] *Hesperia dacotae*	FT	Known to occur in upland native prairie habitat with high abundance of wildflowers, high species diversity, and minimal human disturbance.	No designated critical habitat within the Project Corridor. Field habitat surveys and desktop studies verified that no suitable Dakota skipper habitat is present within the Project Corridor
Birds			
Piping plover[2] *Charadrius melodus*	FT	In North Dakota, breeding and nesting sites for the piping plover can be found along the Missouri River system. The spring/summer reproductive season for the piping plover runs from mid-April through August. Preferred habitat includes riverine sandbars, gravel beaches, alkali areas of wetlands, and flat sandy beaches with little vegetation. The USFWS has identified critical habitat for the piping plover on the Missouri River system.	No designated critical habitat within the Project Corridor. As with other migratory birds, if tree clearing and mowing near large waterbodies is to occur during nesting season, a biologist will review the corridor five days before construction and flag any nests to be avoided. Xcel Energy will install bird diverters along the entire length of the transmission line to reduce the potential for impacts to piping plovers.

Table 6-5. Federally Listed Species with Potential to Occur in the Project Area

Species	Status[1]	Habitat	Potential for Occurrence in Project Corridor and Route
Red knot *Calidris canutus rufa*	FT	The red knot, although rare in the Northern Great Plains, is known to use shoreline/marsh habitat as stopover habitat during its migration. Sightings in North Dakota typically occur in mid-May and mid-September.	Construction is planned for fall and winter when red knots may be migrating through North Dakota. Red knots do not nest in North Dakota, so impacts associated with construction of the Project are not anticipated. In addition, Xcel Energy will install bird diverters along the entire length of the transmission line to reduce the potential impacts to red knots.
Whooping crane[2] *Grus americana*	FE	Whooping cranes migrate through North Dakota along a band running from the south-central to the northwest portions of the state. They use shallow, seasonally and semi-permanently flooded palustrine (marshy) wetlands for roosting, and various cropland and emergent wetlands for feeding. During migration, whooping cranes are often observed in riverine habitats, including the Missouri River. Typically, whooping cranes from the Aransas-Wood Buffalo flock (the flock that is known to migrate through North Dakota) begin migrating north from their wintering grounds in Texas in late March. By early-May, the majority of the migrating population will arrive at their nesting grounds in Wood Buffalo National Park (Alberta and Northwest Territories, Canada). Autumn migration typically begins in mid-September with the majority of the flock arriving back at the wintering grounds by late-October to mid-November.	No designated critical habitat within the Project Corridor. Palustrine emergent wetlands are present within the Project area. According to a map of North Dakota's whooping crane migration corridor produced by the USFWS, the Project area is located within the whooping crane central flyway where 75 percent of confirmed sightings have occurred. However, Xcel Energy will use bird diverters along the entire transmission line to reduce the potential for impacts to whooping cranes.
Gray wolf *Canis lupus*	FE	Preferred habitat includes biomes such as boreal forest, temperate deciduous forest, and temperate grassland. Likely habitat for the gray wolf in North Dakota is the forested areas in north central and northeast parts of the state.	No suitable habitat in the Project area.
Northern long-eared bat *Myotis septentrionalis*	FT	The northern long-eared bat is primarily an eastern US species, but it does occur in North Dakota. Northern long-eared bats spend winter hibernating in caves and during the summer the bats roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees.	Suitable habitat may exist in the Project area, however, it is outside of the known white-nose syndrome area. Much of the land cover in upland areas is not wooded and consists primarily of cropland.

1 FC = federal candidate; FE = federally endangered; FT = federally threatened
2 Critical habitat only identified for the piping plover, whooping crane, and Dakota skipper.
Source: USFWS (2015a, USFWS 2015b)

At the June 15, 2016 meeting the USFWS indicated that potential impacts from the Project appeared to be limited to the following:

- Collision risk from migrating whooping cranes
- Potential habitat for Dakota skipper butterfly
- Bald and golden eagle nest locations – provided locations of two nests within project area and gave recommendations on seasonal scheduling to avoid disturbance to nesting eagles

It was noted that the Project is located outside the white nose syndrome zone for the northern long-eared bat, and under the 4(d) ruling, therefore, there are no restrictions on incidental take of the species within the Project area. (USFWS 2016). It was also noted that the while gray wolves have been observed in McHenry and Ward counties, they are habitat generalists and are unlikely to be impacted by the Project. The USFWS also recommended that clearing and mowing the Project area occur outside of the migratory bird nesting season to avoid impacts to nesting birds and that bird diverters be used along the transmission line to minimize impacts to whooping cranes.

Field habitat surveys verified that no suitable Dakota skipper habitat is present within the Project Corridor. A review of the North Prairie Township reroute determined no suitable Dakota skipper habitat is present.

6.5.3 Mitigation

In addition to continued coordination with USFWS throughout the Project, Xcel Energy will implement the following mitigations measures.

- Xcel Energy will install bird diverters as recommended by the USFWS along the entire transmission line to reduce potential impacts on whooping cranes.
- Xcel Energy will span and otherwise avoid USFWS wetland easements.
- Xcel Energy will, to the extent practicable, conduct tree clearing and mowing activities outside the nesting season for migratory birds (typically March through August).

6.6 Fish and Wildlife Resources

6.6.1 Existing Conditions

Despite the predominance of agricultural land use along the Project ROW, the ROW may be used by animals for foraging, hunting, shelter, breeding, rearing, and during migration. Particular species may include small mammals, such as voles, shrews, mice, squirrels, and rabbits, and larger mammals, such as coyote, raccoon, fox, white-tailed deer; and birds, including migratory waterfowl and songbirds. Additional species, including fish, reptiles, and amphibians, such as snakes, turtles, toads, and frogs, may be found near the non-farmed wetlands and waterway crossings along the Project ROW.

No North Dakota Game and Fish Department (NDGFD) Public Fishing Waters are crossed by the Project (NDGFD 2016).

In addition to the fish and wildlife species listed above, migratory birds and bald and golden eagles are protected by the Migratory Bird Treaty Act (16 USC 703) and the Bald and Golden Eagle Protection Act (16 USC 668-668d). The NDGFD identified two existing eagle nests "in close proximity" to the Project Corridor in a letter to Xcel Energy on September 2, 2016 (**Appendix C**). The USFWS in a meeting with Xcel Energy on June 15, 2016 identified one eagle nest southwest of the Project Corridor near the Souris River (**Appendix C**). Field surveys for raptor nests, conducted on August 30, 2016, and as summarized in the *Raptor and Habitat Survey Report for the Magic City Substation to McHenry Substation 230 kV Transmission Line Project* report included in **Appendix E** of this application, verified the locations of the two eagle nests within a 0.5 mile of the Project Route that were identified by the NDGFD.

6.6.2 Potential Impacts

There is minimal potential for long-term displacement of non-special-status wildlife and loss of habitat from the Project because it will be constructed within an existing, disturbed transmission line ROW and within agricultural fields. Wildlife could be temporarily displaced within the immediate area of construction activity.

Five raptor nests, including two bald eagle nests, were identified during field surveys. Field biologists stated that sufficient screening and distance buffers may be present to minimize disturbance to nesting eagles, however, if construction occurs during the nesting season (March through August) then it is recommended that a biologist review the nests five days before construction to determine if the nests are active. Further, construction activities that occur after the nesting season for bald eagles (September or later) would greatly reduce the risk of disturbance. It was recommended by the USFWS that biologists review the nests five days before initiation of construction activities, and if the nests are active construction should be avoided in that area until the young birds have fledged.

In addition, bird diverters will be used along the entire Project to minimize potential impacts to the federally listed whooping crane, which will also minimize impacts to other bird species. It is anticipated that operations and maintenance of the Project will have similar effects as the existing transmission line.

6.6.3 Mitigation

Xcel Energy will implement the following mitigation measures regarding fish and wildlife resources:

- Xcel Energy will, to the extent practicable, conduct tree clearing and mowing activities outside the nesting season for migratory birds (typically nesting season is March through August).
- If possible, Xcel Energy will conduct construction activities near the known eagle nest after September and before March to reduce potential impacts to eagles. If construction will occur between March and August, field review by a biologist of the known eagle nest near the Souris River will occur five days prior to construction to determine nest activity. If the nest is active construction will be delayed until young birds have fledged.

6.7 Cultural Resources

6.7.1 Existing Conditions

Metcalf Archaeological Consultants (Metcalf) performed a Class I Literature Review for the Project routing and siting area (an approximately 280-square-mile area shown on **Figure 3**) in June 2016 to cover all possible areas where the Project could potentially be located. The file review was completed at the State Historical Society of North Dakota (SHSND). The literature review returned 298 recorded cultural resources within McHenry County and 1,013 recorded cultural resources within Ward County. These cultural resources include architectural sites with post-contact components, architectural site leads, pre-contact sites, and sites with isolated finds.

After the Project Route and Corridor were determined, the Class I Literature Review results were then reviewed within one mile of the Project Route and 18 cultural resource sites were recorded within McHenry County and 5 recorded cultural resource sites within Ward County.

The literature review identified two sites within the Project Corridor, both of which are located within McHenry County. The two sites identified within the Project Corridor are archaeological sites of cultural material scatter. The two archaeological sites have not been evaluated for their eligibility to be listed on the NRHP. One historical railroad was also identified during the literature review; however, the SHPO has previously advised Metcalf not to include railroads in their reporting of literature review and field surveys. In addition, the historical railroad is listed as eligible as a whole, non-contributing element. **Table 6-6** summarizes the previously recorded sites identified within the Project Corridor.

Table 6-6. Previously Recorded Cultural Resource Sites within the Project Corridor

Site Number	Site Type	Description	National Register of Historic Places Eligibility
32MHX0126	Archaeological-site lead	Cultural material scatter	Unevaluated
32MHX0128	Archaeological-site lead	Cultural material scatter	Unevaluated

Field surveys were conducted to determine whether resources associated with these site leads exist in Project Corridor and to determine whether previously unidentified cultural resources are present. A Class III Cultural Resource Inventory of the Project Corridor was conducted by Metcalf. Metcalf surveyed a total of 18.1 miles of the Project Corridor and 6.4 miles of access routes, as well as the proposed Magic City Substation. The remaining 1.9 miles of Project Corridor was not surveyed due to restricted access and areas that are wetlands. No evidence of the two prehistoric site leads was found within the Area of Potential Effect. The survey identified eight newly recorded sites consisting of two architectural sites, one architectural site lead, three historic sites, and two prehistoric isolated finds. Metcalf recommended that the nine sites be recorded as not eligible for inclusion in the NRHP or be avoided. Of the eight sites identified, six are located within the Project Corridor, one is located along an access route, and one is located within the existing McHenry Substation site. GRE and their consultant reviewed cultural resources for the McHenry Substation site expansion, and determined there are no recorded cultural resources within the property. GRE will coordinate separately with SHPO regarding the McHenry Substation expansion. The Metcalf Class III Cultural Resources Inventory Report were submitted to the SHPO for review and concurrence and the letter of concurrence of findings from the SHPO is included in **Appendix C**.

After a reroute was adopted to meet the requirements of a township ordinance in North Prairie Township in McHenry County, Xcel Energy contacted the SHPO to determine if additional field surveys were required along the new segment of transmission line corridor. In an email on February 8, 2017, the SHPO determined that based upon Project documentation, no additional cultural field surveys were required for the reroute segment of the corridor. The SHPO correspondence is included in **Appendix C**.

6.7.2 Potential Impacts

Based upon completed field surveys, Metcalf did not recommend avoidance for any cultural resource sites identified during field surveys and recommended a finding of *No Historic Properties Affected*. Approximately 1.35 miles the Project Corridor was not surveyed due to restricted access, 0.6 mile of Project Corridor was not surveyed due to presence of wetlands, and approximately 4.2 miles of Project Corridor along the North Prairie Township reroute was not surveyed as it was identified after the initial survey was completed. However, the North Dakota SHPO Chief Archaeologist Paul Pichas communicated to Metcalf that field surveys of these remaining areas is not warranted to complete the SHPO consultation, following SHPO review of Project documentation (**Appendix C**).

An Unanticipated Discovery Plan will be prepared for the Project outlining the procedure that will be followed to prepare for and address any unanticipated discoveries of cultural resources, including previously undiscovered archaeological sites and possible human remains. It will provide direction to on-site personnel and their consultants as to the proper procedure to follow in the event that unanticipated discoveries were to be made during construction of the Project. No significant impacts to cultural resources will, therefore, be anticipated from the Project.

In the event that human remains are identified during construction of the Project, work will immediately halt within a minimum of 100 feet of the site and the site will be protected until the SHSND and the North Dakota Indian Affairs Commission, in addition to any involved Tribes that express interest in the Project and identify a potential impact, are consulted.

If confirmed or potential human skeletal remains are discovered, the McHenry County and Ward County sheriff's offices will be contacted. The Sheriff will call the North Dakota State Forensic Examiner to determine whether the remains are associated with a crime scene. If the remains are determined not to be part of an active crime scene or investigation, the North Dakota Chief Archaeologist will be contacted.

6.7.3 Mitigation

SHPO concurred on March 1, 2017 that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected*, so Xcel Energy will not need to avoid any known cultural resource sites.

Xcel Energy will develop an Unanticipated Discovery Plan to outline the procedures for handling such discoveries should previously unknown cultural resources or human remains be inadvertently encountered during construction.

6.8 Air Quality

6.8.1 Existing Conditions

McHenry and Ward counties are in attainment with national and North Dakota ambient air quality standards (AAQS) for all criteria pollutants (ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide, and lead). All areas of areas in North Dakota are currently meeting AAQS.

6.8.2 Potential Impacts

Construction of the transmission line may result in minor short-term air quality impacts from the operation of heavy-duty construction equipment and fugitive dust due to travel on unpaved roads and excavation for transmission structure foundations. Exhaust emissions from construction equipment will include oxides of nitrogen, volatile organic compounds, carbon monoxide, and particulate matter greater than 10 microns in diameter. Because of the short-term nature of the construction activities, local impacts on air quality are expected to be minor. Construction of the Project is not expected to have any long-term or regionally significant impacts on air quality. No permanent sources of emissions are anticipated from the operation of the Magic City Substation or double -circuit transmission line.

6.8.3 Mitigation

To reduce potential impacts to air quality, water may be applied from a water truck, as necessary, to alleviate nuisance dust generated by construction activities.

6.9 Visual Resources

6.9.1 Existing Conditions

Visual or aesthetic resources are naturally occurring or man-made visible physical features (e.g., land, water, vegetation, and structures) that occur along a landscape. Landscape character includes the distinctive qualities and arrangement of the features of a landscape, such as existing man-made features, land, water, and vegetation.

The Project is located primarily in agricultural fields and pastures characterized by flat to gently rolling terrain. Scattered rural residences and forested areas are common within the Project area. The Project crosses the Souris River, Spring Creek, an unnamed creek, and wetlands. The Project will be located adjacent to and an existing transmission line corridor for much of its length, with the exception of an approximately 1.2 mile segment to connect the proposed Magic City Substation to the new transmission line and an approximately 4.2 mile reroute segment in North Prairie Township, McHenry County and New Prairie Township, Ward County. The vegetation within the Project area includes fallow and active croplands and pothole wetlands. Riparian vegetation is also present in the Project Corridor near the Souris River.

Potential visually sensitive areas are limited to those associated with rural residences. No residences are located within the Project ROW or Corridor; six residences are located within 500 feet of the Project Route. Man-made modifications within the Project area include dispersed rural residences associated with agricultural lands and associated ancillary structures (e.g., barns, maintenance sheds, and fences) and the McHenry Substation. Local infrastructure modifications within the area include the existing 115 kV transmission line (to be rebuilt as part of the Project), other transmission lines (constructed with single wood and H-frame poles), State Highways 52 and 41, other local paved and unpaved roads, electric distribution lines (single wood poles), and the McHenry Substation.

6.9.2 Potential Impacts

The proposed transmission structures will be single pole steel structures, which will replace the existing wood H-frame structures. These steel structures will range between 85 and 130 feet tall, while the existing wood H-frame structures being replaced range between 52 and 115 feet tall, but they are single pole structures rather than two-pole H-frame structures[10]. The total number of poles will also decrease by 74 due to the single pole structures being used instead of the H-frame structures. In addition to the increased visual impact from the taller structures, reconstruction of the transmission line will create direct short-term impacts to visual resources by introducing vehicles, equipment, materials, and a workforce during the construction period. Viewers will see transmission line structure assembly and erection and conductor stringing activities. Visual effects

[10] Heights of proposed single pole steel structures are based upon preliminary engineering design.

from construction activities will not be significant because of the short-term duration of the construction timeframe, anticipated to be just a few days at each structure.

Overall, effects to visual resources are anticipated to be less than significant because vertical elements similar to the proposed transmission line already exist in the landscape. It is anticipated that operations and maintenance of the Project will have similar effects as the existing transmission line. Visual impact is minimized by consolidating the 230 kV and 115 kV transmission lines on single pole structures and removing the existing 115 kV transmission line H-frame structures.

6.9.3 Mitigation

Where the Project parallels the existing transmission line, impacts to visual resources will be minimal because the Project will consolidate the 230 kV and 115 kV transmission lines on single pole double circuit structures and reduce the total number of structures required. Visual impacts already exist in the landscape, and impacts to previously undisturbed areas are restricted to the new Magic City Substation, the 1.2 mile segment of new ROW to connect to the new substation, and the 4.2 mile segment of new ROW along the North Prairie Township reroute. Because other electrical facilities and infrastructure already exist on the landscape, visual impacts will be minimal.

Xcel Energy will continue to work with landowners and public agencies to identify concerns related to the transmission line and aesthetics. General mitigation strategies may be utilized to enhance positive effects as well as minimize or eliminate negative effects. Additional potential mitigation measures will be site-specific depending on the landscape type and existing visual character and may include the following:

- Xcel Energy will double circuit existing transmission lines using a single set of new structures and remove the existing H-frame structures.
- Care will be used to preserve the natural landscape to the extent practicable; construction and operation will be conducted to prevent any unnecessary destruction, scarring, or defacing of the natural surroundings; and any disturbed areas will be revegetated after construction in accordance with the SWPPP, guidance from the NRCS, and per landowner requests.
- The proposed transmission line will parallel existing ROW for the majority of the route to minimize visual impacts to farmlands or open spaces.

6.10 Transportation

6.10.1 Existing Conditions

Transportation corridors in proximity to the Project consist of residential roads, county roads, and highways. The Project does not parallel any roadways or railroads, although it will cross 14 local roads, County Highways 16 and 23 in Ward County, State Highways 41 and 97 in McHenry

County, and U.S. Highway 52 in McHenry County. Average daily traffic counts of the state and U.S. highways crossed by the Project are available from the North Dakota Department of Transportation (NDDOT) (NDDOT 2015), and are shown in **Table 6-7**.

Table 6-7. Average Annual Daily Traffic Counts of Federal and State Highways Crossed

Highway Name, County	Average Annual Daily Traffic[1]	Average Annual Commercial Truck Traffic
State Highway 41, McHenry County	805	145
State Highway 97, McHenry County	270	110
U.S. Highway 52, McHenry County	2,565	945

1 Average annual daily traffic counts are provided by North Dakota Department of Transportation 2015 data (NDDOT 2015).

Airport data for McHenry and Ward counties were obtained from the National Flight Data Center and North Dakota GIS Hub. Based upon these data, there are two airstrips located within 5 miles of the Project, although none are located within the Project Corridor (**Figure 3**). The Linrud Airstrip is located approximately 1.8 miles northeast of the Project Route near State Highway 41 and 49th Street North in McHenry County. In addition, the Warren Pietsch Airstrip is located approximately 3.2 miles southwest of the Project, which is approximately 1.2 miles northwest of the town of Sawyer. Both of these are private airports.

Data on railroads crossed by the Project were obtained from the North Dakota GIS Hub (NDGIS 2016). Based upon these data, one railroad is crossed by the Project. The Project crosses the Canadian Pacific Railroad approximately 0.1 mile north of U.S. Highway 52 in McHenry County. The existing 115 kV transmission line currently crosses the railroad at this same location.

6.10.2 Potential Impacts

Effects to transportation resulting in construction of the Project are not expected to be significant and will be temporary in nature. Construction crews will use roadways and overland travel to access structure locations and to install the new structures, string conductor within the Project ROW, and to remove existing transmission structures. A construction crew of approximately 30 people will be required to build the transmission line. It is not anticipated that traffic related to the movement of construction equipment or workers' commutes will have a significant impact on traffic volumes or flow on local roadways or federal/state/county highways. Any increases in traffic will be short term and will be limited to the construction time period near individual transmission structures.

Nineteen roads will be crossed to string or remove the conductor, and traffic will temporarily be delayed for the time that it will take to string or remove the conductor across the road. Conductor stringing and/or removal at these locations is estimated to require only a few hours per crossing. If lane closures are necessary while conductor stringing or removal takes place, at least one lane will remain open to traffic at all times. Removal of existing conductors and the stringing of new overhead conductors over highways will require the installation of temporary wood pole "guard

structures" and other measures to safeguard the public and construction crews. Once the installation of new conductors has been completed, the temporary guard structures will be removed. At some locations, additional measures such as boom trucks equipped with "bat wings" may be employed to ensure that adequate vertical clearance is maintained at the highway crossing during stringing operations. Restriction of traffic may occasionally be required for short periods of time during pole deliveries or during critical wire-stringing activities. Construction crews will work closely with the NDDOT, as well as with the Ward County Highway Department and the McHenry County Road Department to ensure implementation of appropriate measures to safeguard the public and construction crews.

No impacts to airports or heliports during construction or operation of the Project are anticipated. The online FAA Notice Criteria tool was used to determine whether the new transmission structures will require Xcel Energy to file a notice to construct with the FAA (FAA 2016). The screening tool indicated that the closest structure to an airport did not exceed the Notice Criteria; therefore, Xcel Energy is not required to file a Notice of Proposed Construction or Alternation Form 7460-1, as shown in **Appendix C**.

The closest airport, Linrud Airstrip is located 1.8 miles northeast of the Project Route. However, given the proximity to the Project to the airstrip, the North Dakota Aeronautics Commission recommended in a letter dated September 8, 2016 that a Notice of Proposed Construction or Alternation Form 7460-1 be submitted to the FAA to receive a formal response. Xcel Energy provided the FAA Notice Criteria screening tool results to the North Dakota Aeronautics Commission on November 22, 2016, which indicate that a Notice of Proposed Construction or Alternation Form 7460-1 is not required for the Project. After reviewing the Notice Criteria tool results, the North Dakota Aeronautics Commission concurred that no submittal of Form 7460-1 is required. Correspondence with the North Dakota Aeronautics Commission is included in **Appendix C.**

No long-term impacts to railroads are anticipated as a part of the Project because the railroad crossing location of the new double circuit transmission line is in the same crossing location as the existing transmission line. Xcel Energy will coordinate with the Canadian Pacific Railroad prior to conductor stringing or removal activities that cross the railroad. Temporary guard or clearance poles will also be installed to ensure that conductors do not obstruct the railroad during stringing. Once the installation of new conductor or removal of existing conductor has been completed, the temporary guard poles will be removed.

6.10.3 Mitigation

The following mitigation measures will be employed to reduce potential impacts to transportation:

- Roadway crossings will be maintained in a condition that will prevent tracking of sediment onto the roadway.
- Mud tracked onto paved roadways will be shoveled or swept off the road daily.
- Temporary wood pole "guard structures" or boom trucks equipped with "bat wings" may be employed to ensure that adequate vertical clearance is maintained at the highway crossing during stringing operations.

6.11 Health and Safety

6.11.1 Existing Conditions

The Project involves constructing a 20.5-mile-long 230/115 kV transmission line on new single pole steel structures generally parallel to Xcel Energy's existing 115 kV transmission line and then removing the existing 115 kV transmission line. A 1.2 mile segment of 115 kV transmission line will also be built to connect the Magic City Substation to the existing 115 kV transmission line. The Project will be designed according to local, state, NESC, and Xcel Energy standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials, wind and ice loadings, and ROW widths. Construction crews and/or contract crews will comply with local, state, NESC, and Xcel Energy standards regarding installation of facilities and standard construction practices. Established Xcel Energy and industry safety procedures will be followed during and after installation of the transmission line to include posting of clear signage during all construction activities.

Electrical characteristics associated with transmission lines include electric and magnetic fields (EMF), corona, audible noise, and radio and television interference. Corona, audible noise, and radio and television interference are discussed in **Section 6.12**. Electric and magnetic fields are described in this section.

Voltage on any wire (conductor) produces an electric field. The intensity of the electric field is proportional to the voltage of the transmission line and distance from the wires. The flow of electrical current on a wire produces a magnetic field. The intensity of the magnetic field is proportional to the current flow through the wires. EMF extends outward from the wires and decreases rapidly with distance. There is no federal or North Dakota state standard for transmission line EMF.

Stray voltage is a condition that can occur on the electric service entrances to structures from distribution lines, not transmission lines. More precisely, stray voltage can exist when there is a small (1- to 2-volt) voltage difference between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences.

However, transmission lines can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line.

6.11.2 Potential Impacts

The transmission lines will be equipped with protective devices to safeguard the public in the event of an accident, or if the structure or conductor falls to the ground. The protective devices are breakers and relays located where the transmission lines connect to the substations. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation facilities will be properly fenced and accessible only to authorized personnel.

The Project will consist of replacing an existing 115 kV transmission line and will add a new 230 kV transmission line and substation, both of which will be new sources of EMF. However, many studies of EMF have been conducted, but none has identified a cause and effect relationship between EMF exposure and health effects or a mechanism by which EMF could cause disease. Considerable research has been devoted to this subject over the past 30 years. More information and questions and answers can be found on the website for The National Institute of Environmental Health Sciences:

<http://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf>

Since transmission lines do not produce stray voltage, there are no anticipated stray voltage impacts as a result of construction of the Project.

6.11.3 Mitigation

No impacts to human health and safety are anticipated, so no mitigation measures are proposed. However, if stray voltage issues arise as a result of the transmission line proposed in this Application, the Xcel Energy will take appropriate measures to address those issues on a case-by-case basis. Such measures may include avoiding routes that contain distribution lines, placing the transmission line across the road from distribution lines, burying distribution lines, crossing perpendicular to distribution lines, or other measures that reduce the possibility of inducing a voltage on the distribution neutral.

6.12 Corona, Audible Noise, Radio, and Television Interference

6.12.1 Existing Conditions

The potential exists for interference between the proposed transmission line and communications devices, such as radios, televisions, cellular phones, and GPS units. Corona from transmission line conductors can generate electromagnetic “noise” at the same frequencies transmitted by

radio and television signals. (Corona consists of the breakdown or ionization of air within a few centimeters of conductors and hardware.) This noise can cause interference with signal reception depending on the frequency and strength of the radio and television signal. Tightening loose hardware on the transmission line usually resolves the problem.

Audible noise may consist of a variety of sounds of different intensities across the entire frequency spectrum. Audible noise is measured in units of decibels on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA.

The primary land use in proximity to the Project is rural agricultural; rural residences and farmsteads are scattered throughout the Project area. Average background noise levels in these areas are typically in the range of 30 to 40 dBA. Ambient noise in rural areas is commonly caused by rustling vegetation, light traffic, and agricultural equipment use. Higher ambient noise levels, typically in the range of 60 to 80 dBA, are produced near roadways, urban areas, and commercial and industrial properties. Sources of audible noise in proximity to the Project include the equipment noise from agricultural operations, residential activities, and noise generated by cars and trucks along county and local roads and highways.

6.12.2 Potential Impacts

Corona from transmission lines can create buzzing, humming, or crackling. Measures such as carefully handling the conductor during construction to avoid nicking or scraping or otherwise damaging the surface and using hardware with no sharp edges or points are typically adequate to control corona. Corona effects are expected to be low enough that no objectionable audible noise will result outside the Project ROW. Corona-related ozone and nitrogen oxide emissions are the primary air quality concerns related to transmission line operations. The concentration of ozone caused by corona is a few parts per million near the conductor and is not measurable at any distance from the conductor.

It is Xcel Energy's general experience that when the radio or television receiver is located outside the Project ROW, very few problems with radio or television reception are encountered. According to a study conducted by the RUS, television interference from corona generally only occurs at the edge of a ROW during wet weather for transmission lines with voltages of 345 kV or higher (RUS 2013).

Corona associated with the proposed transmission line is expected to be low enough so that no radio or television interference is anticipated outside of the Project ROW, consistent with the operation of the existing transmission line. However, Xcel Energy is committed to taking all reasonable steps to assure area landowners that the Project will not interfere with radio or television reception. In cases where there is a demonstrable effect from the transmission line on

reception, simple corrective steps, such as checking line hardware for loose or defective hardware and repairing or replacing defective items, is very often sufficient to solve the problems. In a very limited number of cases, it has been necessary to take more extensive corrective steps such as relocating individual television or radio antenna systems or installing systems where none previously existed. In most cases, however, it is possible to entirely avoid radio and television interference by appropriate routing steps and by post-construction adjustments of line hardware. It is anticipated that operations and maintenance of the Project will have similar effects as the existing transmission line.

Construction-related noise will result in temporary short-term increases in noise in areas where construction and staging are taking place. The audible noise generated during construction will be caused by foundation construction, assembly and erection of the transmission line structures, removal of transmission line structures, and noise generated by construction equipment such as auguring machines, cranes, heavy machinery, and trucks. Noise levels from operation of the Project at 250 feet from the Project Route will barely be distinguishable when compared to background noise levels in the ambient Project Corridor (RUS 2013).

Noise from heavy machinery during construction of the proposed transmission line may create a short-term nuisance to nearby residents. Xcel Energy will mitigate the nuisance by ensuring that construction vehicles and equipment are maintained in proper operating condition and equipped with manufacturer's standard noise control devices or better (e.g., mufflers or engine enclosures). Noise during operations and maintenance is expected to be the same as the existing transmission line. Indirect effects from post-construction activities, which will include the audible noise impacts from the transmission line and inspection and maintenance activities, will be insignificant because of their short duration and infrequency and will be similar to those associated with the existing transmission line.

6.12.3 Mitigation

This Project is located primarily in a rural agricultural area with only six residences located within 500 feet of the Project Route. Noise from construction will be short-term and temporary, so significant impacts resulting from construction noise are not anticipated, and no significant long-term noise impacts are anticipated from operation of the Project. Therefore, no mitigation will be required for the audible noise generated by the proposed transmission lines. Impacts associated with the generation of corona are not anticipated, and there will be no impact to radio and television interference; therefore, no mitigation measures are proposed.

6.13 Socioeconomics and Environmental Justice

6.13.1 Existing Conditions

According to the U.S. Census Bureau, population estimates as of July 1, 2015, McHenry County, North Dakota had a total population of 5,968, and increase of 10.6 percent since the 2010 census (U.S. Census Bureau 2016). General demographics for McHenry County show a predominantly

non-Hispanic white population (97.1 percent). Per capita income in the county is $34,169 which is approximately 6.6 percent higher than the statewide average of $32,035. Unemployment in McHenry County was 4.2 percent, which is higher than the statewide average of 2.7 percent for the year 2015 (U.S. Bureau of Labor Statistics 2016). Approximately 2.9 percent of McHenry County residents identify as a race other than non-Hispanic white, which is lower than the state average of 11.4 percent. However, the percentage of residents below the poverty line is 11.1, which is 0.1 percent higher than the state-wide average of 11.0 percent (**Table 6-8)**. According to the U.S. Census Bureau American Community Survey 5-year Estimates from 2011 to 2015, Ward County has a rental vacancy rate of approximately 8.8 percent.

According to the U.S. Census Bureau, population estimates as of July 1, 2015, for Ward County, North Dakota had a total population of 71,275, and increase of 15.6 percent since the 2010 census (U.S. Census Bureau 2016). General demographics for Ward County show a predominantly non-Hispanic white population (88.8 percent). Per capita income in the county is $31,215, which is approximately 3.6 percent lower than the statewide average of $32,035. Unemployment in Ward County was 3.1 percent, which is higher than the statewide average of 2.7 percent for the year 2015 (U.S. Bureau of Labor Statistics 2016). Approximately 11.2 percent of Ward County residents identify as a race other than non-Hispanic white, which is lower than the state average of 11.4 percent. In addition, the percentage of residents below the poverty level is 8.4 percent, which is 2.6 percent less than the state-wide average (**Table 6-8)**. According to the U.S. Census Bureau American Community Survey 5-Year Estimates from 2011 to 2015, Ward County has a rental vacancy rate of approximately 8.8 percent (U.S. Census Bureau 2016).

Table 6-8. Socioeconomic Indicator Data for McHenry and Ward Counties*

Location	Population	Race Percentages		Per Capita Income	Population Below Poverty Level (2014 ACS 5-year)	Unemployment Rate (2015)
		Non-Hispanic White	Other			
State of North Dakota	756,927	88.6%	11.4%	$32,035	11.0%	2.7%
McHenry County	5,968	97.1%	2.9%	$34,169	11.1%	4.2%
Ward County	71,275	88.8%	11.2%	$31,215	8.4%	3.1%

ACS = American Community Survey
Source: U.S. Census Bureau (2015)

6.13.2 Potential Impacts

Any impacts to social and economic resources will generally be short term. Xcel Energy anticipates that approximately 30 construction workers will be needed for construction of the Project. The construction contractors will not likely be local. Revenue, therefore, will likely increase for some local businesses, such as restaurants, gas stations, grocery stores, and hotels, because of an increase in the number of out-of-town workers in the area. Other local businesses, such as gravel suppliers, hardware stores, welding and machine shops, and heavy equipment

repair and maintenance service providers, will also likely benefit from construction of the Project. The existing businesses and social services will be adequate to support the Project because of the small size of the construction crew and the short-term nature of the construction activities. Given the relatively small number of the construction workers needed, as well as the relatively high rental vacancy rates (9.4 and 7.2 percent in McHenry and Ward counties, respectively) and short-term nature of the Project, the Project is not anticipated to have a negative effect on housing. The increased availability of reliable power in the area will have a positive effect on local businesses and the quality of service provided to the general public.

Given the relatively small size of the construction crew needed for construction of the Project, no impacts to emergency health care facilities or law enforcement services are anticipated. It is anticipated that operations and maintenance of the Project will have similar effects as the existing transmission line.

The percentages of minority populations in McHenry and Ward counties are lower than those found in the state of North Dakota. The percentage of the population below the poverty line in Ward County (9.3 percent) is lower than that reported for the state of North Dakota (11.9 percent); however, the percentage of the population below the poverty line in McHenry County (13.5 percent) is slightly higher than the state of North Dakota. Per capita income in both McHenry and Ward counties is slightly lower that the North Dakota average.

Based upon the poverty and income levels in McHenry and Ward counties, it is not anticipated that the Project will have disproportionate environmental effects on minority and low-income populations, either during construction or operations and maintenance. In addition to income and poverty levels in the Project area that are similar to state-wide averages, the Project involves rebuilding an existing transmission line and operating and maintaining this new transmission line almost entirely within an existing ROW. Therefore, the Project will not significantly impact any populations that are not currently impacted by the existing transmission line.

6.13.3 Mitigation

Any adverse impacts to socioeconomic conditions within the Study Area will be short term due to the duration of construction and size of projected workforce; therefore, no mitigation is proposed.

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7.0 AGENCY COORDINATION AND IDENTIFICATION OF PERMITS AND APPROVALS

Xcel Energy is required to obtain approvals from a variety of federal, state, and local agencies prior to constructing the Project. This section summarizes Xcel Energy's consultations with these agencies as the status of these other permits and approvals.

7.1 Agency Consultation

NDAC § 69-06-01-05 lists 27 state agencies or officers that are entitled to notice of the applicant's proposed action. Letters describing the Project were sent to the applicable agencies in August 2016. Copies of these letters and all responses received are included in **Appendix C**; a summary of the responses received as of March 7, 2017, are presented in **Table C-1** in **Appendix C**. A summary of meetings with federal and state agencies is listed below.

Xcel Energy will continue to meet with federal, state, and city and county officials as the Project moves forward and Xcel Energy seeks any necessary permits from these agencies.

7.2 Federal Agencies

U.S. Army Corps of Engineers

The Project will require authorization from the USACE for wetland impacts under Section 404 of the clean water act. Xcel Energy discussed the Project with USACE staff during telephone and email correspondence (included in **Appendix C**) and learned the following:

- The Project will likely qualify for coverage under a Nationwide Permit if wetland impacts are less than 0.5 acre.
- A conservative wetland delineation using desktop methods will be appropriate because much of the Project Corridor wetlands are in farmed fields where soils, vegetation, and hydrology are often altered.
- Impacts to wetlands should be avoided if practicable.
- GRE will apply for a separate authorization and permit with the USACE for their McHenry Substation expansion.

U.S. Department of Agriculture - Natural Resources Conservation Service

Xcel Energy sent a Project review letter to the NRCS office and requested comments on the Project. NRCS responded, in a letter dated September 16, 2016, that form NRCS-CPA-106 should be completed to determine whether the Farmland Protection Policy Act applies to the Project. NRCS also recommended that impacts to wetlands be avoided. However, an email follow-up from the NRCS State Soil Liaison on December 7, 2016, stated that the NRCS acknowledges that the Project is excluded from the Farmland Protection Policy Act because no federal funding will be used for the Project.

U.S. Fish and Wildlife Service

Xcel Energy met with USFWS staff on June 15, 2016. A summary letter was submitted to USFWS on August 10, 2016 (see **Appendix C**). A brief summary of USFWS coordination is below:

- Endangered species – USFWS endangered species concerns were related to the Dakota skipper (butterfly) and whooping crane.
- Dakota skipper – Dakota skipper could be present in the Project area if native prairie exists. USFWS recommended a survey to determine whether native prairie exists and, if so, to submit a survey plan.
  Follow up: Xcel Energy's biologists surveyed and found no suitable habitat in the Project Corridor. A review of the North Prairie Township reroute determined no suitable Dakota skipper habitat is present.
- Whooping crane – The Project is located within the whooping crane migratory corridor. The USFWS recommended installation of bird diverters for all areas of the line that are within one mile of suitable stopover habitat (shallow wetlands).
  Follow up: Xcel Energy will install bird diverters in accordance with USFWS recommendations.
- Eagles – The USFWS identified one eagle nest near the Souris River on the southwestern side of the river. USFWS recommended that nearby construction take place in September to minimize impacts to the nest.
- Migratory birds – USFWS recommended that Xcel Energy clear and mow areas outside the migratory bird nesting season. Also, USFWS recommends that if tree clearing occurs during nesting season that surveys be done for nesting birds.
- Wetland easements – The Project Corridor crosses the J. Clark Salyer and Audubon Wetland Management Districts, within which several wetland areas are protected by USFWS easements. These wetlands can be spanned but poles must be located outside protected wetlands. Xcel Energy will coordinate with local USFWS wetland district managers to assure poles are located outside USFWS protected wetlands.
  Follow up: Pole locations have been reviewed by USFWS wetland district staff to ensure the Project will conform to the wetland easements.

7.2.1 State Agencies

North Dakota Aeronautics Commission

The North Dakota Aeronautics Commission responded to a Project review in a letter dated September 8, 2006. The North Dakota Aeronautics Commission's letter recommended completion of FAA form 7460-1 because an airstrip is present northeast of the project approximately two miles north of the proposed corridor.

Xcel Energy followed up by completing an online FAA Notice Criteria tool that found that no notice was required. Results of this online screening were sent to the North Dakota Aeronautics Commission on November 22, 2016; the commission agreed no further action will be required based on the online screening.

North Dakota Department of Health

The North Dakota Department of Health (NDDoH) responded to the Project review letter by commenting that the Project must take measures to minimize noise, release of fugitive dust, and impacts to waterbodies. The NDDoH also indicated that a construction stormwater permit will be required for the Project.

North Dakota Department of Transportation

The NDDOT responded to the Project review letter stating that the Project will have no adverse effect on highways. However, the NDDOT indicated that utility permits will be required and any work in the highway ROW will require permits and risk management documents.

North Dakota Game and Fish Department

Xcel Energy sent a Project review letter to NDGFD. The NDGFD responded with a letter dated September 2, 2016, that listed several concerns. The NDGFD recommended that impacts to native prairie and wetlands be avoided, that construction at the Souris River be conducted outside April 15 to June 1, and that overhead lines be marked with bird diverters. The NDGFD also noted the presence of two bald eagle nests within 0.5 mile of the Project, and suggested a 0.5 mile construction buffer be implemented around active eagle nest sites (known occupied within the last 5 years). The NDGFD's comments concluded with a statement that they do not believe the Project will result in significant adverse effects on wildlife or habitat provided the department's recommendations are implemented.

North Dakota Parks and Recreation Department

The North Dakota Parks and Recreation Department (NDPRD) responded to the Project review letter indicating that the Project will not affect any park land but will cross two snowmobile trails. The NDPRD's response also included a map showing locations of known rare plant, animal, and ecological communities. None of the rare species range or habitat lies within the Project Corridor and no impacts are anticipated to the snowmobile trails.

North Dakota State Historic Preservation Office

Xcel Energy submitted the results of a Class I Literature Review to the North Dakota State SHPO on May 5, 2015 for the Project Study Area. As a result of the initial correspondence with SHPO regarding the Class I Literature Review, Metcalf conducted a Class III Cultural Resource Inventory for the Project Corridor and the Magic City Substation. Xcel Energy submitted the Class III Cultural Resource Inventory Reports for the Magic City Substation and 230 kV Transmission Line on

February 27, 2017. SHPO concurred on March 1, 2017 that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected* (**Appendix C)**.

North Dakota State Water Commission

Xcel Energy sent a Project review letter to the NDSWC. The Commission responded with comments regarding potential impacts to the Souris River floodplain and floodway and indicated that a sovereign land permit may be needed.

Table C-1 in **Appendix C** summarizes all relevant Project correspondence with federal, state, and local agencies.

7.2.2 Local Permits

McHenry County

A CUP, necessary to construct a transmission line within the McHenry County Agricultural District, was approved by the McHenry County Board of Commissioners in December 2016. A Setback Variance was also approved by the McHenry County Board of Commissioners in February 2017 to permit the placement of transmission structures within setback areas.

Ward County

A Subdivision Plat was approved by the Ward County Board of Commissioners in August 2016 to facilitate the purchase of the Magic City Substation parcel. A Building Permit will be obtained for substation facilities prior to construction. A SUP and Setback Variance are not required in the Agricultural Zoning District per the Ward County Zoning Ordinance confirmation has been provided by the Ward County Planning and Zoning Administrator.

North Prairie Township (McHenry County)

Xcel Energy submitted the Proposed Route in a revised CUP and Setback Variance application to North Prairie Township on February 17, 2017. A hearing has been scheduled for March 15, 2017. An update will be filed with the Commission following the upcoming North Prairie Township hearing.

Miscellaneous Local Permits

Right-of-Way Utility Permits, Approach Permits, Road Use Agreements, and Road Crossing Licenses will be obtained from each County and Township within the Project Route, as necessary.

7.3 Potential Permits/Approvals

The federal, state, and local permits or approvals that have been identified as potentially required for the construction and operation of the Project are shown in **Table 7-1**. Permits dependent on the final route and structure location will be applied for in winter and spring of 2017 prior to construction.

Table 7-1. Potential Permits and Approvals Required for Construction and Operation of the Project

Agency	Type of Permit or Approval	Status[1]	Need
Federal			
USACE	Clean Water Act §404 – Nationwide Permit 12	3	Wetland desktop reviews are currently underway to ensure that the Project minimizes impacts to waters of the United States and to determine whether project impacts remain below the pre-construction notification threshold or will require notification GRE will obtain the necessary authorization and permit for their McHenry Substation expansion.
USFWS	No approval necessary, but Xcel Energy has consulted with USFWS regarding Endangered Species Act, Migratory Bird Treaty Act, and Bald and Golden Eagle Protection Act	3	Consultation is ongoing. Xcel Energy will install bird diverters on the 230 kV transmission line and has verified that there are no structures within USFWS wetland easements. Raptor nests within one mile were identified and a habitat survey determined that suitable Dakota skipper habitat is not present within the Project Corridor. A review of the North Prairie Township reroute determined no suitable Dakota skipper habitat is present.
State of North Dakota			
North Dakota Public Service Commission	Public Convenience and Necessity, Certificate of Corridor Compatibility and Route Permit	1	Required for transmission lines over 115 kV.
State Historical Preservation Office	Concurrence with effect determinations	1	Class I Literature Search and Class III Intensive Cultural Resources Inventory have been completed for the Project Corridor. The reports will be submitted to SHPO for review and concurrence.
North Dakota Department of Health, Water Quality Division	Clean Water Act §401 for 404	2	Required for Projects permitted under USACE NWP 12. Pre-construction notification will be submitted to the NDDoH concurrently with the USACE submittal to request Section 401 Water Quality Certification.
North Dakota Department of Health, Water Quality Division	Clean Water Act §402- National Pollutant Discharge Elimination System General Permit for Stormwater Discharges Associated with Construction Activity	2	Required for disturbance of over 1 acre of land. Must prepare a SWPPP to accompany permit application.

Table 7-1. Potential Permits and Approvals Required for Construction and Operation of the Project

Agency	Type of Permit or Approval	Status[1]	Need
North Dakota State Water Commission	Sovereign Lands Permit	3	If Project construction activities impact an island or bed of state-defined navigable waters or streams (NDCC § 61-33)
North Dakota Department of Transportation	Utility Occupancy Permit	2	Permits highway crossings and approaches to build facilities associated with the Project.
Local			
Ward County	Subdivision Plat	1	Approval to subdivide and plat an existing lot, necessary to facilitate the purchase of the Magic City Substation property.
	Building Permit	2	Permit to build aboveground facilities associated with the Project.
	Floodplain Permit	2	Permit for structures located within floodplain.
	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	County Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
McHenry County	Conditional Use Permit	1	Permit build transmission line within the Agriculture Zoning District.
	Setback Variance	1	Permit for structures located within setback areas.
	Floodplain Permit	2	Permit for structures located within floodplain. (The Office of State Engineer, State National Flood Insurance Program Coordinator has requested that Xcel Energy submit cross sections and calculate floodwater conveyance for pre- and post-Project conditions.)
	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	County Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
North Prairie Township	Conditional Use Permit	1	Permit to build transmission line within the Agriculture Zoning District.
	Setback Variance	1	Permits road crossings for facilities associated with the Project.
	Township Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
Brown Township	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	Township Approach Permit	2	Permits road approaches for construction access.

Table 7-1. Potential Permits and Approvals Required for Construction and Operation of the Project

Agency	Type of Permit or Approval	Status[1]	Need
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
Velva Township	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	Township Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
New Prairie Township	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	Township Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
Sundre Township	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	Township Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.
Nedrose Township	ROW Utility Permit	2	Permits road crossings for facilities associated with the Project.
	Township Approach Permit	2	Permits road approaches for construction access.
	Road Use Agreement	2	Permits haul routes and construction equipment road use.

1 Status Explanation: 1 = Applied and/or Decision Pending, 2 = Will Apply Prior to Construction, 3 = Final Layout will Determine Whether Permit/Approval is Needed

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8.0 FACTORS CONSIDERED

Section 49-22-09 of the NDCC lists 11 factors to guide the Commission in the evaluation and designation of the corridor and route.

8.1 Public Health and Welfare, Natural Resources and the Environment

In developing the Corridor and Route, Xcel Energy sought to minimize potential impacts to public health and welfare, natural resources, and the environment. **Section 6.0** summarizes the potential effects of the proposed facility on public health and welfare, natural resources, and the environment. **Section 6.0** also identifies Xcel Energy's proposed mitigation measures that will be employed to minimize these potential impacts.

8.2 Technologies to Minimize Adverse Environmental Effects

Xcel Energy will utilize the most current technologies and industry-standard approaches to minimize environmental impacts, including designing and constructing the Project according to Avian Powerline Interaction Committee (APLIC 2012) recommendations, avoiding of cultural resources, and minimizing impacts to wetlands and streams. In addition, bird diverters will be installed along the Project to minimize the likelihood of large birds such as cranes colliding with the transmission line.

8.3 Beneficial Uses of Waste Energy

This factor is not applicable to the Project.

8.4 Unavoidable Adverse Environmental Effects

The Project will introduce a new visual component into the landscape; however, the new structures will be located in approximately the same location as the existing transmission line. In addition, the existing landscape in the vicinity of the Project Corridor already includes existing high-voltage transmission lines, electrical distribution lines, and radio towers. The proposed Magic City Substation will add a new visual impact to the Project area, although within the Project area there are other existing developments, such as a quarry and residential housing, which have similar impacts. The Project Route is expected to permanently impact approximately 11.6 acres of land during operation, assuming a 10-acre Magic City Substation, a McHenry Substation expansion of 1.4 acres, and either 78.5 or 19.6 square feet per structure for a total of 0.2 acre.[11]

8.5 Alternatives to the Proposed Route

Other alternatives were considered for the Project Route within the area between the northern terminus (Magic City Substation) and the southern terminus (McHenry Substation). Xcel Energy believes that the proposed location is the most viable route alternative based on landowner preferences; the fact that the Project Route primarily follows existing utility ROW; and is the most

[11] Two hundred twelve structures, each consisting of either 78.5 or 19.6 square feet per pole, is approximately 7,752 square feet, or 0.2 acre.

direct route that also minimizes impacts on the exclusion, avoidance, selection, and policy criteria identified in NDAC § 69-06-08-02. Additional discussion of the alternatives considered are located in **Section 5.0** of this Application.

8.6 Irreversible and Irretrievable Commitment of Natural Resources

Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable timeframe. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but these include those resources primarily related to construction and the small permanent footprint of the Project.

The small size of the permanent footprint, approximately 11.6 acres, means that there will be minimal irreversible damage to regional natural resources. This damage will primarily involve the soil and agricultural property used for the structures and substations. Restoration after the life of the transmission line will reduce these potential irreversible impacts. Irretrievable resource commitments also include permanent losses of nonrenewable resources such as fossil fuels. Natural gas, energy, and non-recyclable materials used in construction and operation will represent irretrievable commitments of non-renewable resources that will not be available for use in other projects. These resources are not in short supply, and their use will not have an adverse effect on the availability of these resources.

8.7 Direct and Indirect Economic Impact of the Proposed Transmission Facility

The Project will enable power to be delivered from the existing Souris Substation to the Minot area to increase overall capacity of the electrical system to support new growth and development in the area. The Project will also reduce overloads at the existing McHenry Substation to increase the reliability of the electrical grid. Direct and indirect economic benefits of the transmission line are primarily positive. Increased electrical capacity in the Minot area will allow for continued reliable electrical service in new growth and development areas.

To the extent that local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in McHenry and Ward counties will contribute to the total personal income of the region. Additional personal income will be generated for residents in the county and the state by circulation and recirculation of dollars paid out by Xcel Energy as business expenditures and state and local taxes. Expenditures made for equipment, energy, fuel, operating supplies, and other products and services benefit businesses in the county and the state. Long-term beneficial impacts to the county's tax base as a result of the construction and operation of the transmission line will contribute to improving the local economy in this area of North Dakota.

Direct positive economic impacts associated with the Project include payments made to landowners for the transmission line easement. While minor negative impacts may occur during construction, direct negative economic impacts are minimal because agricultural areas surrounding each transmission line structure can still be farmed, and landowner compensation will be established by individual easement agreements.

8.8 Existing Development Plans in the Vicinity of the Route

No conflicts are anticipated with existing state and local government and private entities' development plans. The vast majority of the Project Route was developed based on voluntary easement agreements with landowners.

8.9 Effects on Scenic and Cultural Resources

There are no designated recreational or scenic resources that will be affected by the Project. **Section 6.7** describes the cultural resources for the Project. No impacts to cultural resources are anticipated.

8.10 Effects on Biological Resources

Biological resources within the Project Corridor and potential effects as a result of the Project are discussed in **Section 6.0** of this application. Effects will be avoided and minimized to the extent practicable. The transmission line and substation will be designed and constructed following APLIC (APLIC 2006) recommendations to minimize the risk of electrocution for birds, and the Project will be marked with bird diverters to minimize impacts to whooping cranes and other large birds. Other effects to biological resources are anticipated to be minimal because the majority of the Project will follow an existing transmission line.

8.11 Problems Identified by Agencies

Agency coordination and potential permits/approvals are discussed in **Section 7.1** and **Section 7.2**, respectively. In general, the agencies that responded concluded that the Project will have minimal adverse effects. A copy of agency correspondence is included in **Appendix C**.

8.12 Effects on Present and Future Natural Resource Development

No conflicts are anticipated with any publicly available and currently known state and local government, or private entities' natural resource development plans. The Project Route was developed based on the location of an existing utility line and on a large majority of voluntary easement agreements with landowners.

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9.0 QUALIFICATIONS OF CONTRIBUTORS

Name Project Role	Education and Professional Experience
Thomas Hillstrom Principle Permitting Agent Xcel Energy	Mr. Hillstrom is a Principal Permitting Agent with Xcel Energy and has over 25 years of environmental review and permitting experience with the last 13 years focusing on review and permitting of electric transmission lines. Mr. Hillstrom received his Bachelors of Science degree in Biology/Environmental Studies from the University of Minnesota
Noel Klinnert, PE, PMP Xcel Energy	Mr. Klinnert has 10 years of Transmission Line Engineering and Project Management experience. His experience includes design and engineering of distribution and transmission power line facilities. His project management experience includes managing all facets of project scope, schedule and cost of electric substation and power line facilities. Mr. Klinnert is a licensed Professional Engineer in the state of Minnesota and is a licensed Project Management Professional with certification from the Project Management Institute. Mr. Klinnert received his Graduate degree in Infrastructure Systems Engineering from the University of Minnesota and Bachelor's degree in Civil Engineering from North Dakota State University.
Jeff Marquardt, PE Senior Transmission Line Engineer Xcel Energy	Mr. Marquardt has over 15 years of engineering experience with over five years related to the design of overhead transmission lines. He has designed projects of similar scope and complexity in Wisconsin and Michigan. A recent example is a 36 mile transmission line rebuild in Northern Wisconsin where an existing 69kV line rebuilt on the same corridor to double circuit 161kV/69kV. Mr. Marquardt is licensed engineer in the state of Wisconsin and is working towards licensure in North Dakota. He graduated from the University of Wisconsin-Madison in 2001 with a BS degree in Civil and Environmental Engineering.
Sean Lawler, RWA Siting & Land Rights Agent Xcel Energy	Mr. Lawler has 5 years of experience related to the planning, siting and acquisition of permits and land rights for the construction, operation and maintenance of electric and gas utility facilities. His experience includes land rights negotiation, local permitting, right-of-way management, damage settlements and permit compliance for electric and gas utility corridors. Mr. Lawler has a BA in Planning and Community Development from St. Cloud State University.
Leslie Knapp, PG Senior Project Manager Tetra Tech, Inc.	Ms. Knapp has 34 years of experience related to NEPA and state level environmental review and permitting. Her experience includes routing and siting, managing field surveys, environmental review, permitting, public outreach, and coordination and consultation with agencies for transmission lines, power plants, and other facilities conducted for private industry and state, local, federal, and military agencies throughout the US. Ms. Knapp is a Professional Geologist in Minnesota and Wisconsin. She has a MA in Earth Science/Geology and a BA in General Science/Biology.
Mark Rothfork, PMP Environmental Planner Tetra Tech, Inc.	Mr. Rothfork has 17 years professional experience responsible for project management, fieldwork, and research and environmental permitting. Mr. Rothfork's experience includes transmission line siting/routing and permitting, power plant siting and permitting, transportation planning and permitting, GIS mapping, public involvement, state and federal level environmental review documents.
Jared Brandell-Douglas Environmental Scientist Tetra Tech, Inc.	Mr. Brandell-Douglas has 5 years of experience in environmental planning, policy and regulation with an emphasis in transmission line and pipeline siting and permitting. Mr. Brandell-Douglas has a BA in Biology with a Concentration in Environmental Studies from St. Olaf College.

Name Project Role	Education and Professional Experience
John Cannon Environmental Planner AECOM	Mr. Cannon has 8 years of professional experience with a primary focus on environmental permitting, NEPA compliance, wetland management, NPDES compliance, and SWPPP management services for pipeline, energy transmission, and transportation projects throughout the Midwest. His technical responsibilities have included state and federal agency coordination, field work coordination and supervision, permit application preparation, client coordination, and technical report preparation. Mr. Cannon has a BS in Environmental and Natural Resources and an MS in Urban and Regional Planning (Environmental Planning Specialization) from the University of Minnesota (U of M) – Twin Cities. He is a certified Delineator In-Training (#5140) through the U of M's Minnesota Wetland Delineator Certification Program.

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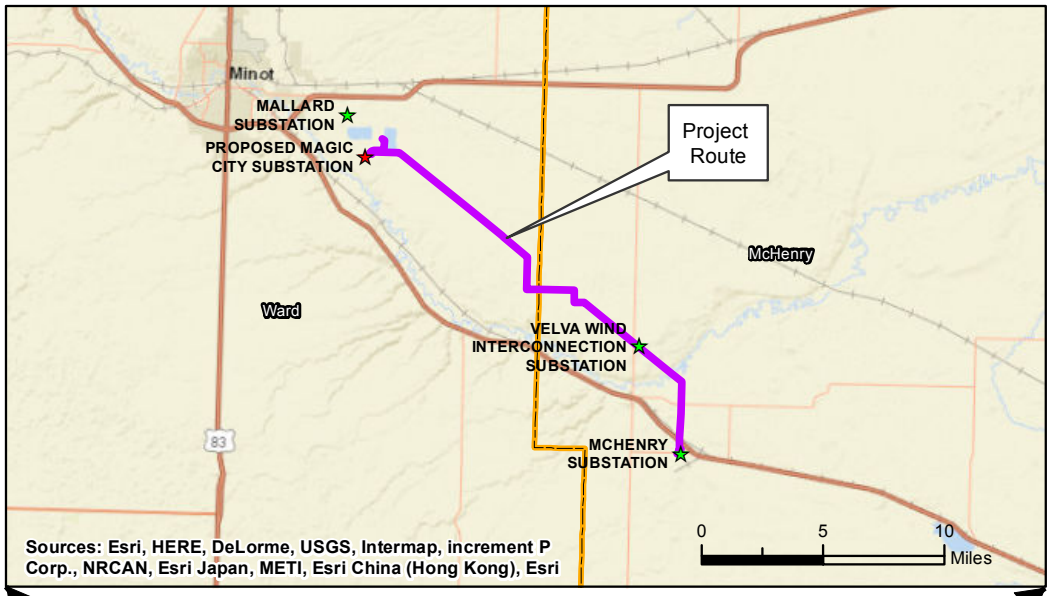
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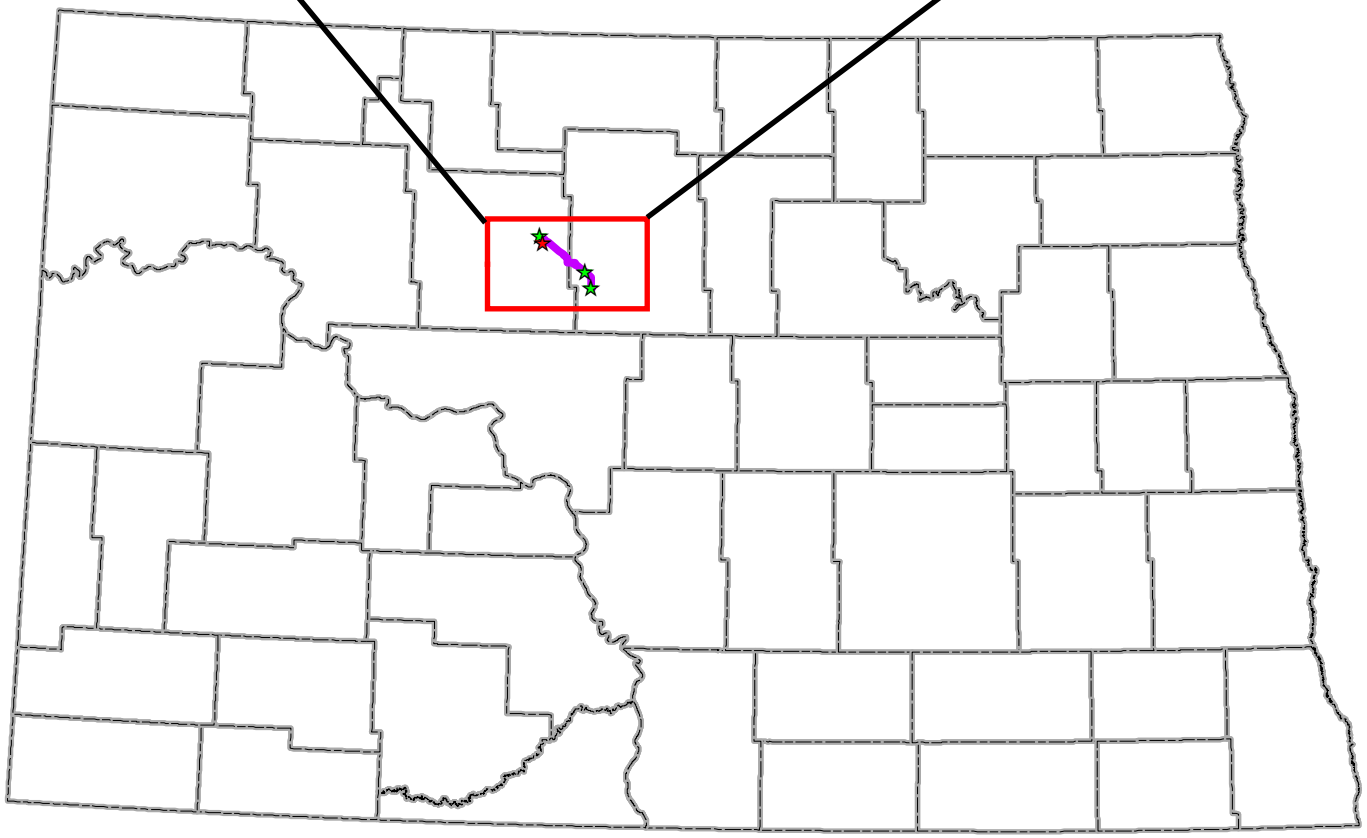
Act	North Dakota Energy Conversion and Transmission Facility Siting Act
AAQS	Ambient Air Quality Standards
APLIC	Avian Power Line Interaction Committee
Applicant	Northern States Power Company d/b/a/ Xcel Energy
Basin	Basin Electric Power Cooperative
BLM	Bureau of Land Management
BMP	Best Management Practice
CFR	Code of Federal Regulations
Class I Cultural Resources Inventory	Existing data inventory—a large-scale review and compilation of known cultural resource data
Class III Cultural Resources Inventory	Field inventory to identify cultural resources that could be affected by project facilities within the Project area
Commission	North Dakota Public Service Commission
Corridor Certificate	Certificate of Corridor Compatibility
CPCN	Certificate of Public Convenience and Necessity
CUP	Conditional Use Permit
dBA	Decibels on the A-weighted Scale
EMF	Electric and Magnetic Fields
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GPS	Global Positioning System
GRE	Great River Energy
Guidelines	Commission Application Guidelines for a Certificate of Corridor Compatibility
ICBM	Intercontinental Ballistic Missile
kV	Kilovolt
Metcalf	Metcalf Archaeological Consultants, Inc.
Minot Study	Joint Minot Load Serving Study
MISO	Midcontinent Independent System Operator
MLRA	Major Land Resource Area

MTEP	MISO Transmission Expansion Plan
NDAC	North Dakota Administrative Code
NDCC	North Dakota Century Code
NDDoH	North Dakota Department of Health
NDDOT	North Dakota Department of Transportation
NDGFD	North Dakota Game and Fish Department
NDGIS	North Dakota GIS Hub
NDPRD	North Dakota Parks and Recreation Department
NDSWC	North Dakota State Water Commission
NESC	National Electrical Safety Code
NFIP	National Flood Insurance Program
NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSP	Northern States Power Company – Minnesota
NWI	U.S. Fish and Wildlife National Wetland Inventory
Project	Minot Load Serving Project
Route Permit	Transmission Facility Route Permit
ROW	Right-of-Way
RUS	U.S. Department of Agriculture, Rural Utilities Service
SHPO	State Historic Preservation Office
SHSND	State Historical Society of North Dakota
Siting Act	North Dakota Energy Conversion and Transmission Facility Siting Act
SUP	Special Use Permit
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

FIGURES

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North Dakota

Legend

- Project Route
- Proposed Substation
- Substation

20 0 20 Miles

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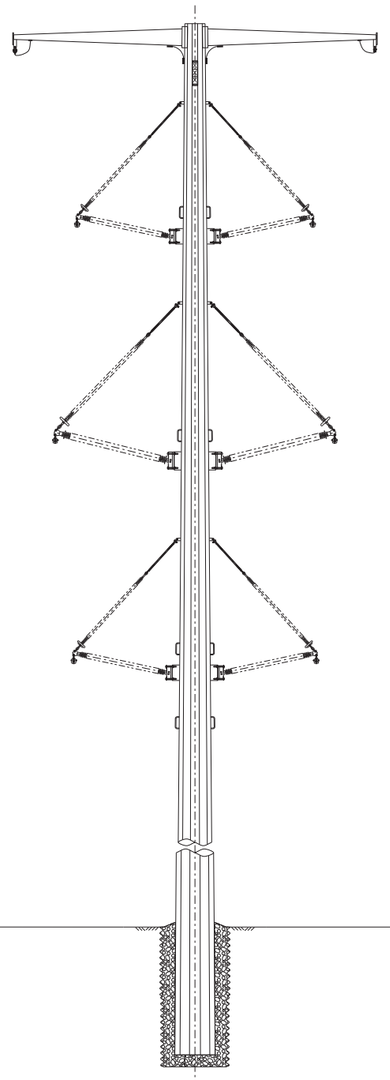
Xcel Energy® RESPONSIBLE BY NATURE®

Minot Load Serving Project

McHenry and Ward Counties, North Dakota

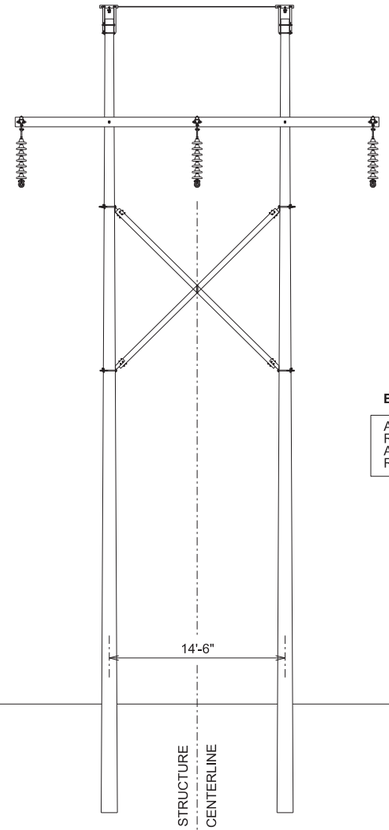
Figure 1
Project Location Map
March 2017

TYPICAL TANGENT CONSTRUCTION SHOWN.
ADDITIONAL RIGHT-OF-WAY WIDTH MAY INCREASE AS DICTATED BY SPAN LENGTHS AND/OR STRUCTURE LOCATIONS.



NEW TRANSMISSION LINE STRUCTURES - OVERALL

AVERAGE STRUCTURE HEIGHT: 100'
RANGE OF STRUCTURE HEIGHTS: 85' TO 130'
AVERAGE SPAN LENGTH: 540'
RANGE OF SPAN LENGTHS: 113' TO 1,000'



EXISTING TRANSMISSION LINE STRUCTURES

AVERAGE STRUCTURE HEIGHT: 58'
RANGE OF STRUCTURE HEIGHTS: 52' TO 115'
AVERAGE SPAN LENGTH: 706'
RANGE OF SPAN LENGTHS: 113' TO 840'

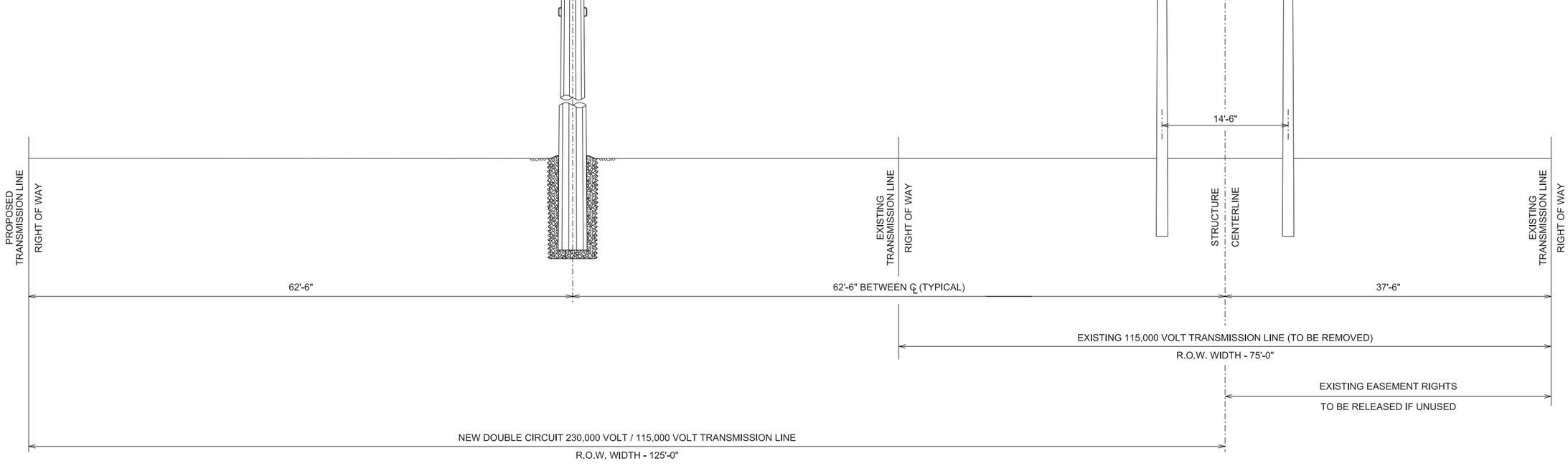


Figure 2

RIGHT OF WAY WIDTH REQUIREMENTS

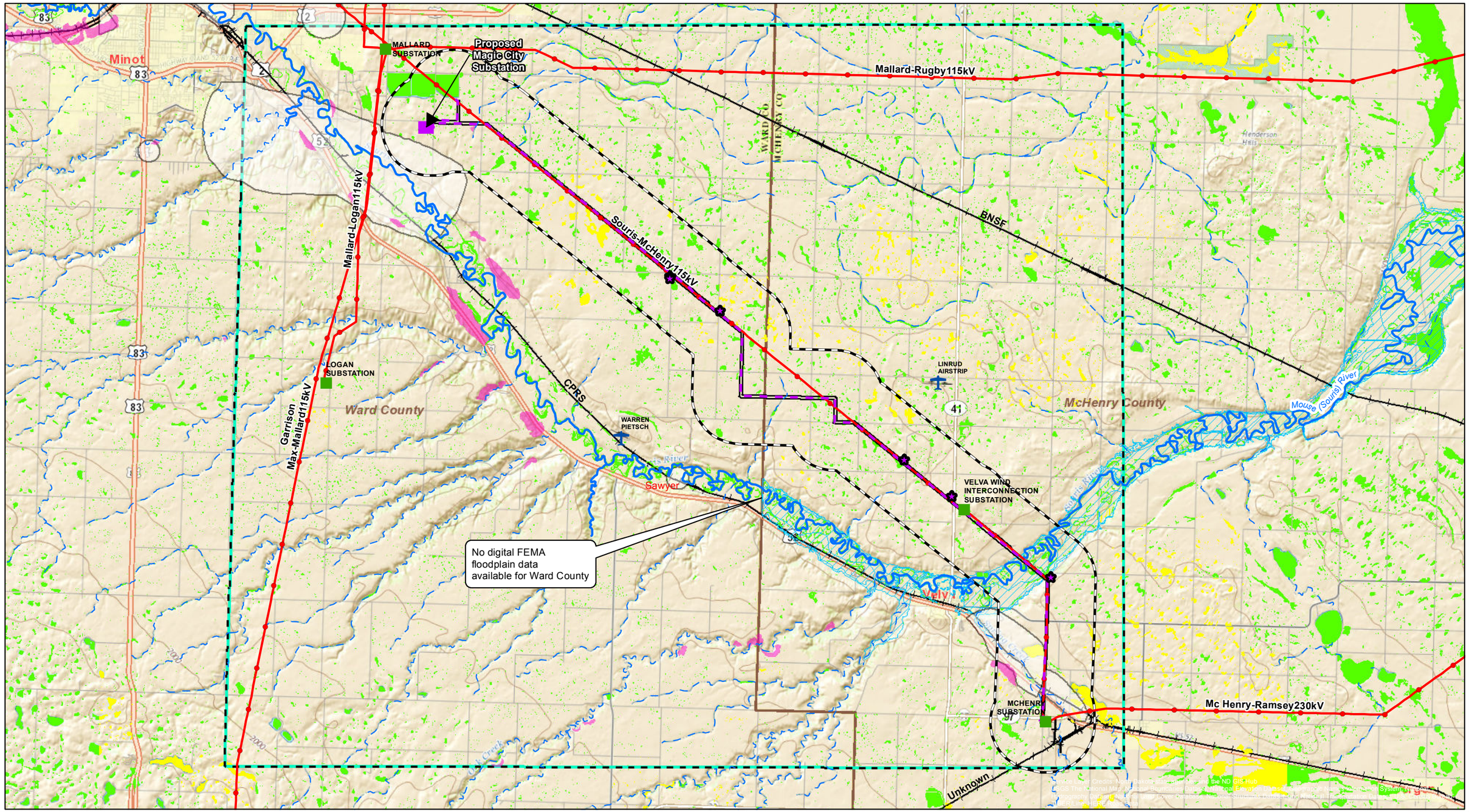
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LINE 0924 230kV
PERMIT DRAWING
EXHIBIT 1 - R.O.W. WIDTH SKETCH - 550' RULING SPAN

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ND-270540-P1-1.DGN
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Project Feature
- Initial Siting and Routing Area
- 1-Mile Study Area
- Project Corridor
- Project Route
- Proposed Magic City Substation

Existing Utility
- Transmission Line

Constraint
- Stream (Intermittent)
- Stream (Perennial)
- Available FEMA Floodplain
- USFWS Easement Wetland
- NWI Wetland
- Airport

Avoidance Area
- Water Source - Community Wellhead Protection Area
- Residence within 500' (Waiver signed)
- Geologically Unstable Area Landslide Deposit Area

Exclusion Area
- None Identified

N

0 1 2 Miles

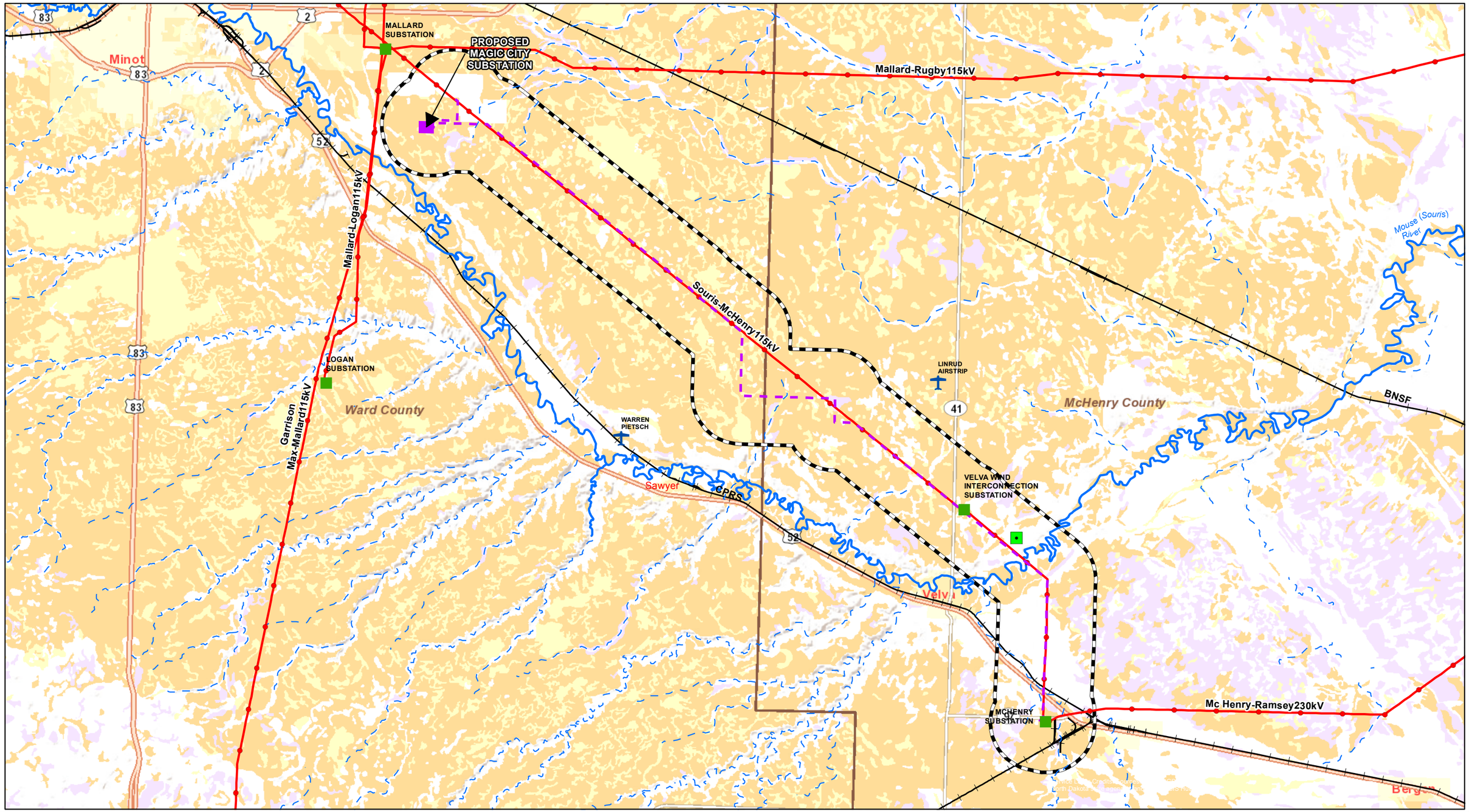
Minot Load Serving Project
Exclusion and Avoidance Area Map
McHenry and Ward Counties, North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	Figure 3

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Project Feature
- 1-Mile Study Area
- Proposed Alignment
- Proposed Magic City Substation
- Approximate Staging Area Location

Existing Utility
- Transmission Line
- Substation

Water Feature
- Stream (Intermittent)
- Stream (Perennial)

Transportation
- Airport
- Railroad
- Business Loop
- Interstate
- State Highway
- U.S. Highway

Prime Farmland
- All areas are prime farmland
- Farmland of local importance
- Farmland of statewide importance
- Prime farmland if drained

0 1 2 Miles

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Minot Load Serving Project
Prime Farmland Map
McHenry and Ward Counties, North Dakota

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FIGURE NUMBER	Figure 4

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MALLARD SUBSTATION

PROPOSED MAGIC CITY SUBSTATION

Mallard-Rugby115kV

Souris-McHenry115kV

Mallard-Logan115kV

Garrison Max-Mallard115kV

LOGAN SUBSTATION

Minot

Ward County

McHenry County

WARREN PIETSCH

LINRUD AIRSTRIP

VELVA WIND INTERCONNECTION SUBSTATION

MCHENRY SUBSTATION

Mc Henry-Ramsey230kV

Sawyer

Velva

Underwood

Bergen

Mouse (Souris) River

BNSF

OPRS

Service Layer Credits: North Dakota state agencies and the ND GIS Hub

National Landcover Center Data

- Unclassified
- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land
- Deciduous Forest
- Evergreen Forest
- Mixed Forest
- Shrub/Scrub
- Herbaceuous
- Hay/Pasture
- Cultivated Crops
- Woody Wetlands
- Emergent Herbaceuous Wetlands

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Project Feature
- 1-Mile Study Area
- Proposed Alignment
- Proposed Magic City Substation
- Approximate Staging Area Location

Existing Utility
- Transmission Line

Water Feature
- Stream (Intermittent)
- Stream (Perennial)

Transportation
- Airport
- Railroad
- Business Loop
- Interstate
- State Highway
- U.S. Highway

N

0 1 2 Miles

Minot Load Serving Project
National Land Cover Data Map
McHenry and Ward Counties, North Dakota

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FIGURE NUMBER	Figure 5

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Project Feature
- 1-Mile Study Area
- Proposed Alignment
- Proposed Magic City Substation
- Approximate Staging Area Location

Existing Utility
- Transmission Line

Water Feature
- Stream (Intermittent)
- Stream (Perennial)
- FEMA Floodplain
- NWI Wetland

Transportation
- Railroad
- Airport

USFWS Easement
- USFWS Wetland Easement

Well Head Protection Area
- Community WHPA
- Non-Community WHPA

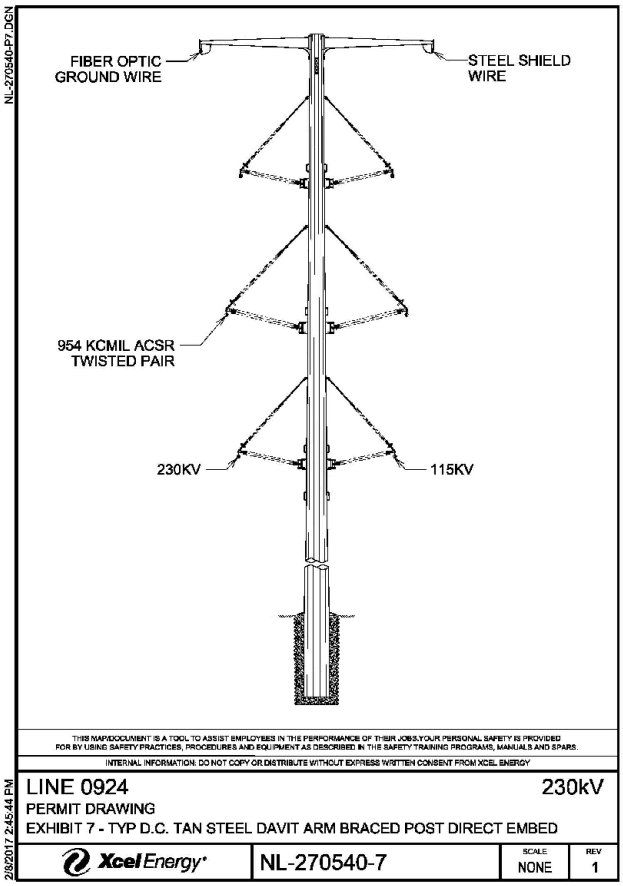
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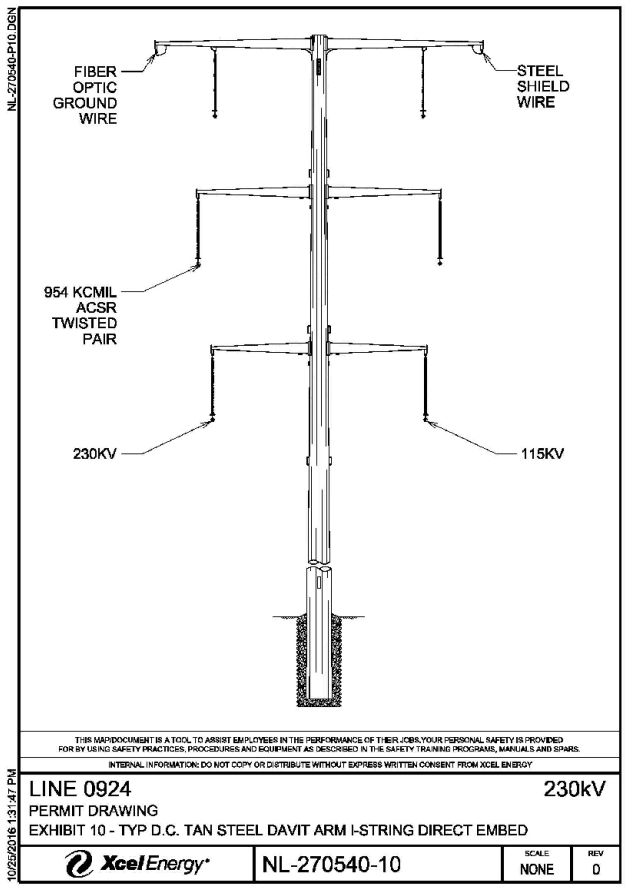
0 1 2 Miles

Minot Load Serving Project
Water Resource Map
McHenry and Ward Counties, North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	Figure 6





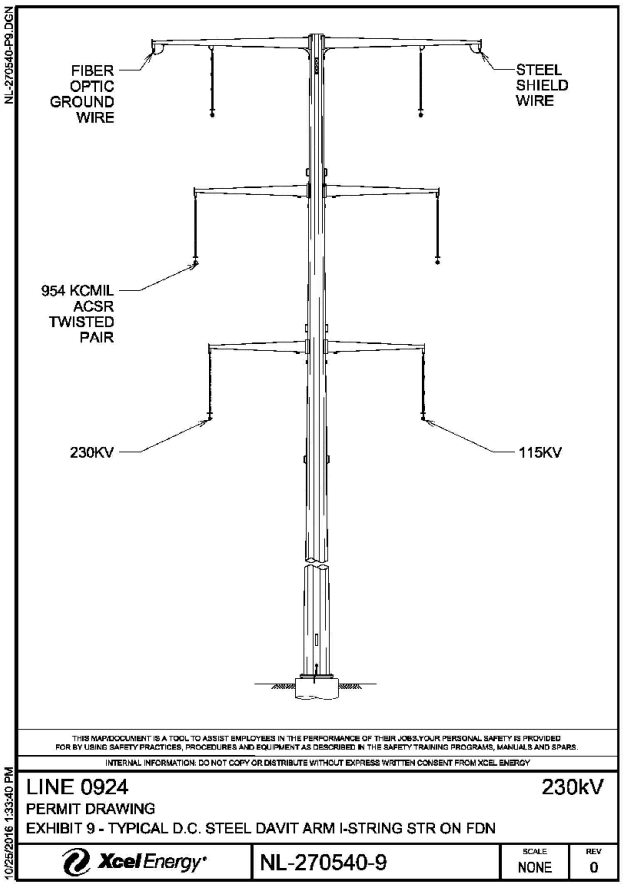
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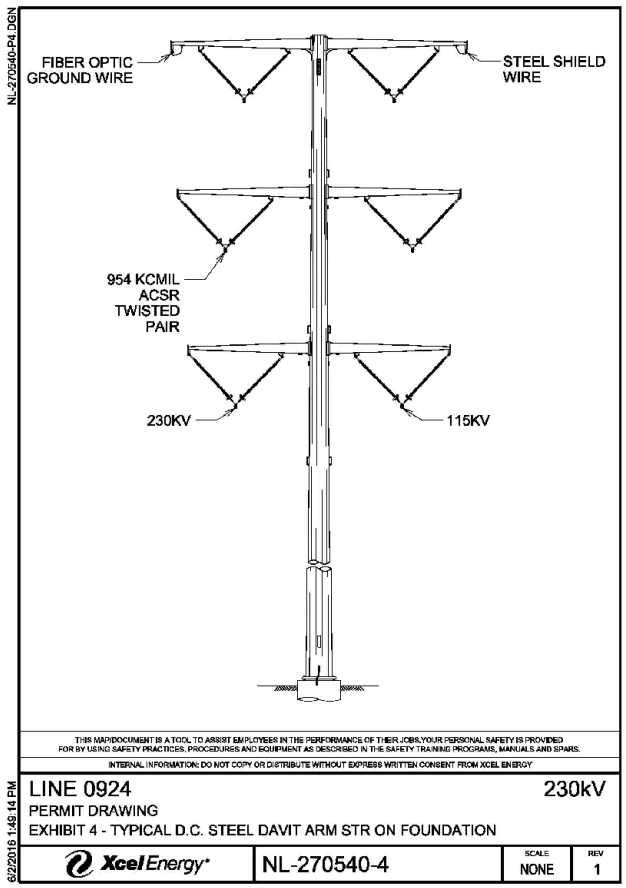
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Minot Load Serving Project

McHenry and Ward Counties, North Dakota

Figure 7A
Typical Direct Embed
Double Circuit Structures
March 2017





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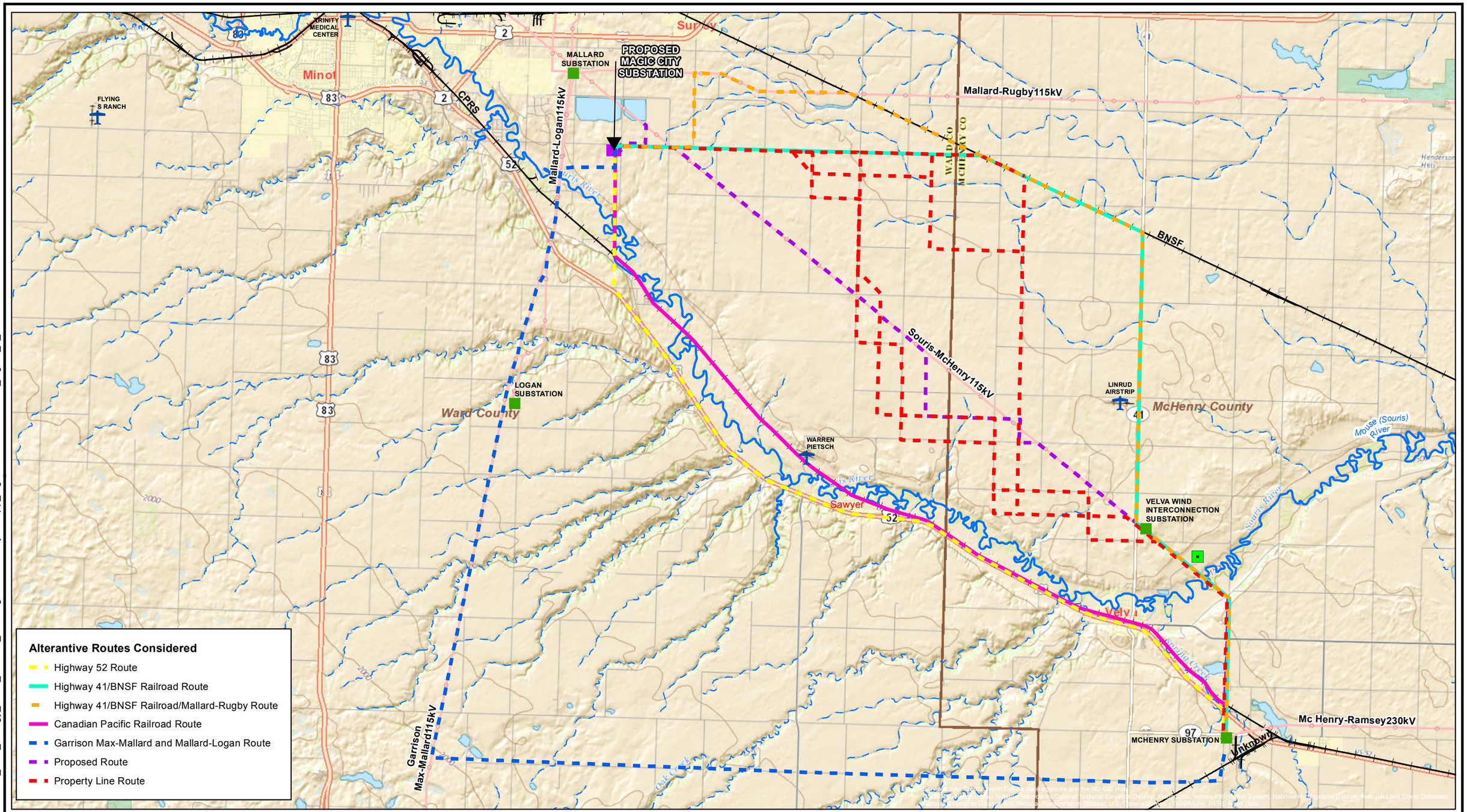
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Minot Load Serving Project

McHenry and Ward Counties, North Dakota

Figure 7B
Typical Self-Supporting Double Circuit Structures
March 2017

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Project Feature
- Proposed Magic City Substation
- Approximate Staging Area Location

Existing Utility
- Transmission Line

Water Feature
- Stream (Intermittent)
- Stream (Perennial)

Transportation
- Railroad
- Business Loop
- Interstate
- State Highway
- U.S. Highway
- Airport
- City Boundaries
- Counties

N

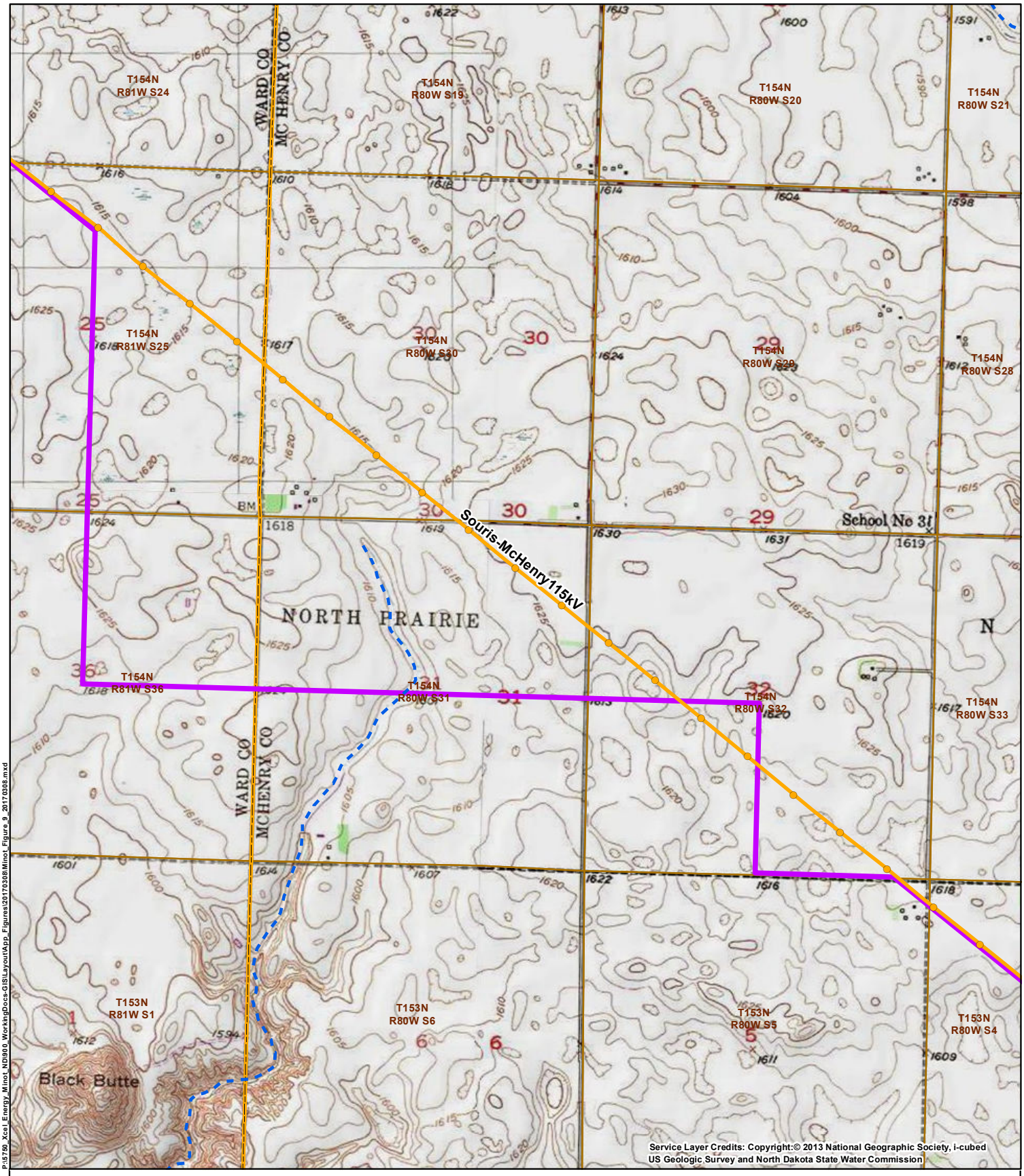
0 1 2 Miles

Minot Load Serving Project Alternative Routes Considered Map McHenry and Ward Counties, North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	Figure 8



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Project Feature
- Proposed 230/115 kV Alignment

Existing Utility
- 115 kV Transmission Line

Stream
- Stream (Intermittent)
- Stream (Perennial)

Jurisdiction
- County
- Section

0 500 1,000 2,000 Feet

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Minot Load Serving Project

McHenry and Ward Counties, North Dakota

Figure 9
North Prairie Township Reroute Map
March 2017

Appendix A Certificate of Corridor Compatibility Completion Checklist and Transmission Facility Route Permit Completion Checklist

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Table A-1. Certificate of Corridor Compatibility Completion Checklist

State Authority	Description	Application Section
Chapter 49-22-08 Part 1	Application for a certificate — Notice of filing — Amendment — Designation of a site or corridor	1.0
a.	A description of the size and type of facility.	1.0, 3.0
b.	A summary of any studies which have been made of the environmental impact of the facility.	Agency correspondence included in Appendix C
c.	A statement explaining the need for the facility.	4.0
d.	An identification of the location of the preferred site for any energy conversion facility.	N/A
e.	An identification of the location of the preferred corridor for any transmission facility.	3.1, 3.3,Table 3-3
f.	A description of the merits and detriments of any location identified and a comprehensive analysis with supporting data showing the reasons why the preferred location is best suited for the facility.	5.0, 6.0, Tables 5-1 through 5-5, Figures 3-6
g.	A description of mitigative measures that will be taken to minimize all foreseen adverse impacts resulting from the location, construction, and operation of the proposed facility.	6.1.3, 6.2.3, 6.3.3, 6.4.3, 6.5.3, 6.6.3, 6.7.3, 6.8.3, 6.9.3, 6.10.3, 6.11.3, 6.12.3, 6.13.3
h.	An evaluation of the proposed site or corridor with regard to the applicable considerations set out in section 49-22-09 and the criteria established pursuant to section 49-22-05.1.	5.0, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, Tables 5-1 through 5-4, 8.0
i.	Such other information as the applicant may consider relevant or the commission may require.	
Chapter 49-22-05.1	The commission shall develop criteria to be used in identifying exclusion and avoidance areas and to guide the site, corridor, and route suitability evaluation and designation process. Except for transmission lines in existence before July 1, 1983, areas within five hundred feet [152.4 meters] of an inhabited rural residence must be designated avoidance areas. This criterion does not apply to a water pipeline. The five hundred foot [152.4 meter] avoidance area criteria for an inhabited rural residence may be waived by the owner of the inhabited rural residence in writing. The criteria may also include an identification of impacts and policies or practices which may be considered in the evaluation and designation process.	5.0, Tables 5–1 through 5-4
Chapter 49-22-09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	8.0
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4

Table A-1. Certificate of Corridor Compatibility Completion Checklist

State Authority	Description	Application Section
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility	8.7
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities	8.11, Agency correspondence included in Appendix C
Chapter 69-06-05-01 part 2	Application Contents	See Table A-2 for details and locations of compliance with this Chapter.

Table A-2. Transmission Facility Route Permit Completion Checklist

State Authority	Description	Application Section
Chapter 49-22-08 Part 1	Application for a permit - Notice of filing - Amendment - Designation of a route	
a.	A description of the type, size, and design of the proposed facility.	1.0, 3.0
b.	A description of the location of the proposed facility.	3.1, 3.2, 3.3, Table 3-3, Table 3-4
c.	An evaluation of the proposed route with regard to the applicable considerations set out in section 49-22-09 and the criteria established pursuant to section 49-22-05.1.	5.0, 8.0, Tables 5–1 through 5-4
d.	A description of mitigative measures that will be taken to minimize all foreseen adverse impacts resulting from the location, construction, and operation of the proposed facility.	6.1.3, 6.2.3, 6.3.3, 6.4.3, 6.5.3, 6.6.3, 6.7.3, 6.8.3, 6.9.3, 6.10.3, 6.11.3, 6.12.3, 6.13.3
e.	A description of the right-of-way preparation and construction and reclamation procedures.	3.7
f.	A statement setting forth the manner in which: (1) The utility will inform affected landowners of easement acquisition, and necessary easement conditions and restrictions. (2) The utility will compensate landowners for easements, without reference to the actual consideration to be paid.	3.6
g.	Such other information as the utility may consider relevant or the commission may require.	
Chapter 69-06-05-01 part 2	Application Contents	
a.	A description of the following	
1)	The type of facility proposed.	1.0, 3.0
2)	The purpose of the facility.	1.0, 3.0, 4.0
3)	The technology to be deployed.	1.0, 3.0
4)	The type of product to be transmitted.	3.1, 3.2
5)	The source of the product to be transmitted	3.1, 3.2
6)	The final destination of the product to be transmitted.	3.1, 3.2
7)	The proposed size and design and any alternate size or design that was considered, including	
a)	The width of right-of-way	1.0, 3.1, 3.2, 3.3, 3.7
b)	The approximate length of facility;	1.0, 3.2
c)	The estimated span length for electric facilities;	3.2, 3.7
d)	The anticipated type of structure for electric facilities;	1.0, 3.1, 3.2, 3.3, 3.7, Figures 7a and 7b
e)	The voltage for electric facilities;	1.0, 3.1, 3.2, 3.3, 3.7
f)	The requirement for and general location of any new associated facilities;	1.0, 3.1, 3.2, 3.3, 3.7
g)	The estimated distance between surface structures for pipeline facilities;	N/A

Table A-2. Transmission Facility Route Permit Completion Checklist

State Authority	Description	Application Section
h)	The pipe size for pipeline facilities;	N/A
i)	The maximum design operating pressure and temperature for pipeline facilities;	N/A
j)	The maximum design flow rate for pipeline facilities; and	N/A
k)	The number and general location of compressor or pumping stations.	N/A
b.	The anticipated time schedule for accomplishing major events, including	
1)	Obtaining the certification of corridor compatibility;	3.5, Table 3-5
2)	Obtaining the route permit;	3.5, Table 3-5
3)	Completing right-of-way acquisition;	3.5, Table 3-5
4)	Starting construction;	3.5, Table 3-5
5)	Completing construction;	3.5, Table 3-5
6)	Testing operations; and	3.5, Table 3-5
7)	Commencing Operations	3.5, Table 3-5
c.	A copy of each evaluative study or assessment of the environmental impact of the proposed facility submitted to the agencies listed in section 69-06-01-05 and each response received.	Agency correspondence included in Appendix C
d.	An analysis of the need for the proposed facility based on present and projected demand for the product transmitted, including the most recent system studies supporting the analysis of the need.	4.1
e.	A description of any feasible alternative methods for serving the need	4.2
f.	The width of a corridor must be at least ten percent of its length, but not less than one mile [1.61 kilometers] or greater than six miles [9.66 kilometers] unless another appropriate width is determined by the commission.	3.3, Sheet maps in Appendix B
g.	A study area that includes a proposed corridor of sufficient width to enable the commission to evaluate the factors addressed in North Dakota Century Code section 49-22-09.	3.3, Figures 4-6
h.	A discussion of the factors in North Dakota Century Code section 49-22-09 to aid the commission's evaluation of the proposed route.	5.0, 8.0, Tables 5-1 through 5-4
i.	A discussion of the applicant's policies and commitments to limit the environmental impact of its facilities, including copies of board resolutions and management directives.	5.4
j	Identification and map of the criteria that led to the proposed route location within the designated corridor, including exclusion areas, avoidance areas, selection criteria, policy criteria, design construction limitations, and economic considerations.	5.1, 5.3, 5.4, 5.5, 5.6, 6.0, Tables 5–1 through 5-5, Figures 3-6
k.	A discussion of the relative value of each criteria and how the applicant selected the proposed corridor location, giving consideration to all criteria and how the location, construction, and operation of the facility will affect each criteria.	5.1, 5.2, 5.3, 5.4, 5.5, 5.6
l.	A discussion of the general mitigative measures that the applicant will take to minimize adverse impacts that result from a route location in the proposed corridor and the construction and operation of the facility.	6.1.3, 6.2.3, 6.3.3, 6.4.3, 6.5.3, 6.6.3, 6.7.3, 6.8.3, 6.9.3, 6.10.3, 6.11.3, 6.12.3, 6.13.3
m.	The qualifications of each person involved in the corridor location study.	9.0

Table A-2. Transmission Facility Route Permit Completion Checklist

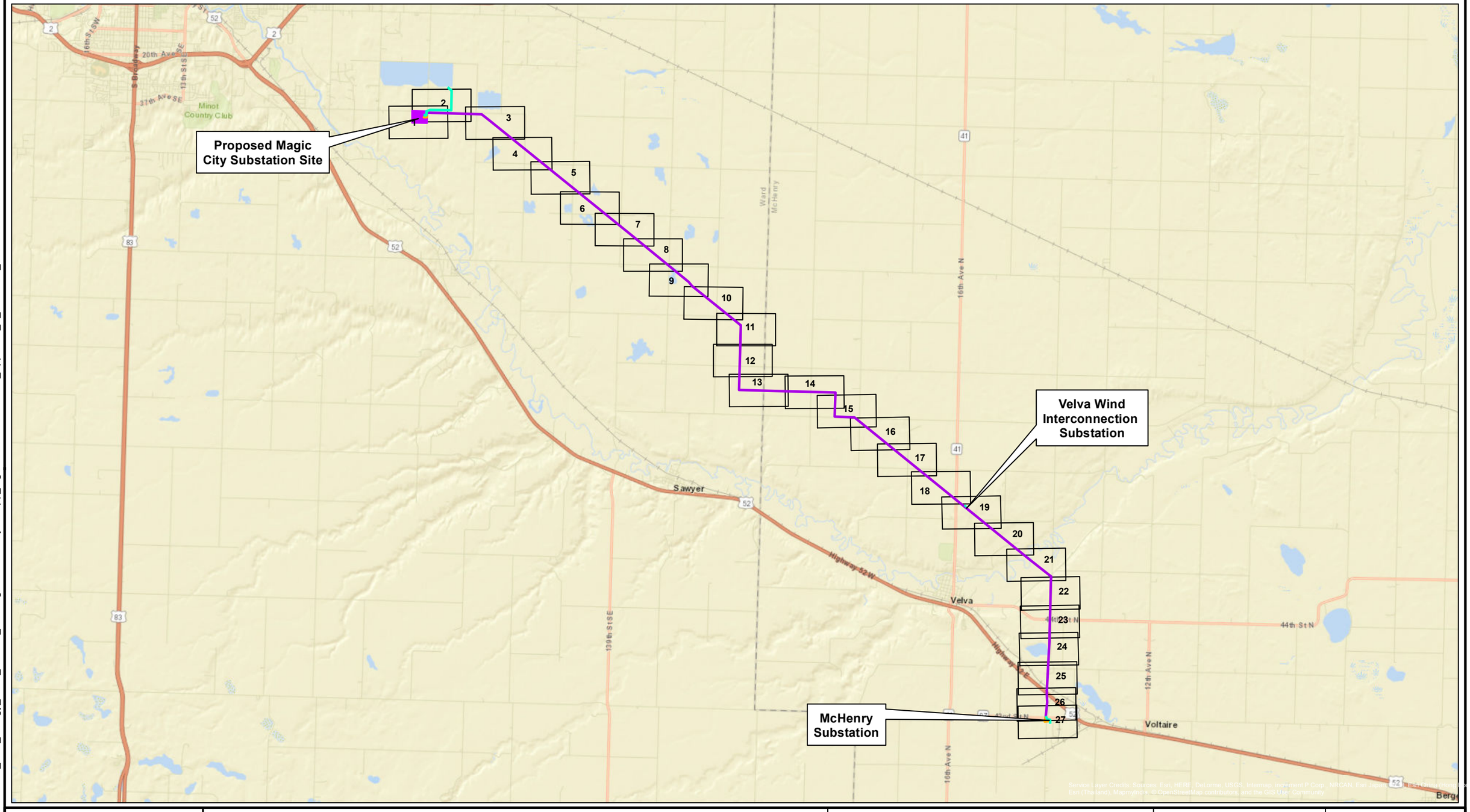
State Authority	Description	Application Section
n.	A map identifying the criteria that led to the proposed route location within the designated corridor and the location of any new associated facilities. Several different criteria may be shown on each map depending on the map scale and the density and nature of the criteria.	Figures 1, 3-6
o.	An eight and one-half-inch by eleven-inch black and white map suitable for newspaper publication depicting the site area.	Provided under separate cover
p.	A discussion of present and future natural resource development in the area.	8.12
q.	Map and GIS requirements. The applicant shall provide information that is complete, current, presented clearly and concisely, and supported by appropriate references to technical and other written material available to the commission. Data must be submitted in the ESRI shapefile or geodatabase format. If the applicant cannot submit the data in the ESRI format, an alternate format may be submitted with written approval by commission staff. Data must include appropriate attribute data for the included features. Relevant and complete metadata in compliance with FGDC metadata standards must be provided with all files. Supporting documents such as base maps, figures, cross sections, and reports must be submitted in the portable document file (PDF). If the supporting documents were derived from GIS/Cad files the supporting GIS/Cad files must also be included in the submittal. Aerial photos (raster images) must be georeferenced and submitted in TIFF, GEOTIFF, or MrSID image file formats with the associated word files. Appropriate metadata must be provided with all files, such as the source for the raster images, dates of aerial photography, and the type of imagery, color bands, i.e., black and white, color, color infrared, and any other pertinent data. All GIS base map data must be referenced to a published geographic or projected coordinate system. The appropriate systems would be North Dakota coordinate system of 1983, north and/or south zones US survey feet (NAD 83). UTM zone 13N or 14N meters (NAD 83), or geographic coordinate system (WGS 84) meters. The vertical datum must be the North American vertical datum of 1988. Tabular data (i.e., laboratory analytical data, water level evaluation data, monitor well construction data, well and boring X and Y location data, grain size analysis data, hydraulic conductivity data, etc.) must be submitted in either a Microsoft Excel or Microsoft Access database format or both if both are used. Textural data may be submitted in Microsoft Word or PDF format. The application may be submitted to the commission on the following media: Compact disc (CD-ROM (CD-R)), digital versatile disc (DVD-R or DVD+R), or other media upon commission approval.	Xcel Energy will continue to coordinate with Commission staff regarding map and GIS requirements.
Chapter 49-22- 09	Factors to be considered in evaluating applications and designation of sites, corridors, and routes.	
1.	Available research and investigations relating to the effects of the location, construction, and operation of the proposed facility on public health and welfare, natural resources, and the environment.	8.1
2.	The effects of new energy conversion and transmission technologies and systems designed to minimize adverse environmental effects.	8.2
3.	The potential for beneficial uses of waste energy from a proposed energy conversion facility	8.3
4.	Adverse direct and indirect environmental effects which cannot be avoided should the proposed site or route be designated.	8.4

Table A-2. Transmission Facility Route Permit Completion Checklist

State Authority	Description	Application Section
5.	Alternatives to the proposed site, corridor, or route which are developed during the hearing process and which minimize adverse effects.	8.5
6.	Irreversible and irretrievable commitments of natural resources should the proposed site, corridor, or route be designated.	8.6
7.	The direct and indirect economic impacts of the proposed facility	8.7
8.	Existing plans of the state, local government, and private entities for other developments at or in the vicinity of the proposed site, corridor, or route.	8.8
9.	The effect of the proposed site or route on existing scenic areas, historic sites and structures, and paleontological or archaeological sites.	8.9
10.	The effect of the proposed site or route on areas which are unique because of biological wealth or because they are habitats for rare and endangered species	8.10
11.	Problems raised by federal agencies, other state agencies, and local entities	7.1, 7.2, 8.11, Appendix C

Appendix B Project Sheet Maps

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Xcel Energy®
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Project Feature

- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Proposed Magic City Substation

Sheet Map Index

- Sheet Map Index

N

0 1 2 Miles

Minot Load Serving Project
Appendix B - Sheet Map Index Map
McHenry and Ward Counties, North Dakota

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Scale:	1:118,000
PROJECT NUMBER	60342328
FIGURE NUMBER	Appendix B

T155N
R82W S35

37th Ave

Proposed Magic
City Substation Site

0850-131
0850-132
0850-133
0850-134
0850-135
0850-130
0924-188-DE
0924-187
0924-186
0924-185
0924-184
0850 Sub
0850-129
5572 Sub
0850 Sub
0924-189-DE
0924 Sub
0924-190-DE
0924 Sub
0924 Sub

T154N
R82W S2

86th St

T154N
R82W S1

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	1

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T155N
R82W S35

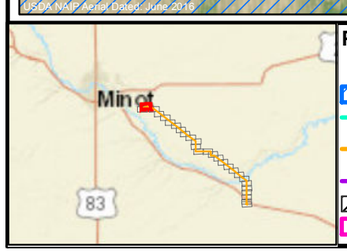
86th St

Proposed Magic City Substation Site

37th Ave

0850-140
0850-140
0850-139
0850-138
0850-137
0850-131
0850-132
0850-133
0850-134
0850-135
0850-136
0850-130
0924-188-DE
0924-187
0924-186
0924-185
0924-184
0924-183
0924-182
0924-181
0924-180
0850 Sub
0850 Sub
5572 Sub
0850-129
0850 Sub
5572 Sub
0924-189-DE
0924 Sub
0924 Sub
0924-190-DE
0924 Sub

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project Appendix B - Project Sheet Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	2



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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	3

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\App_Figures\20170308\Minot_Appendix_B_20170309.mxd

0924-169
0924-168
0924-167
0924-166
0924-165
0924-164
0924-163
0924-162
0924-161
0924-160
0924-159

T154N R81W S6
T154N R81W S7
T154N R81W S8
T154N R81W S5

54th Ave

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	4





Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland
- USFWS Wetland Easement Wetland

Access Route

- Primary Access
- Secondary Access
- Landowner Permission Required

N

0 200 400 Feet

Minot Load Serving Project Appendix B - Project Sheet Map McHenry and Ward Counties, North Dakota

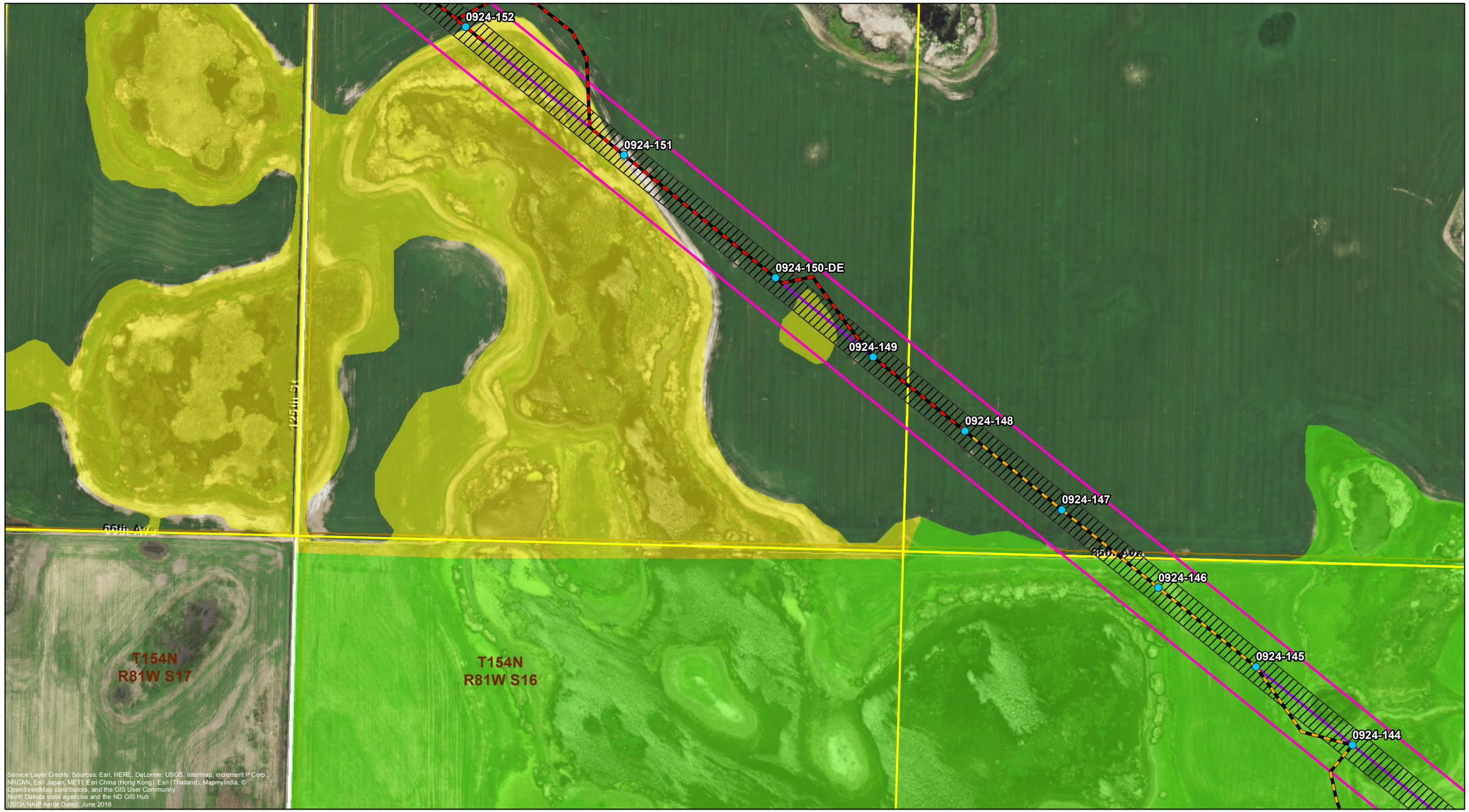
Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	3/9/2017
Approved:	LHK	3/9/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		5

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Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland
- USFWS Wetland Easement Wetland

Access Route

- Primary Access
- Landowner Permission Required

N

0 200 400 Feet

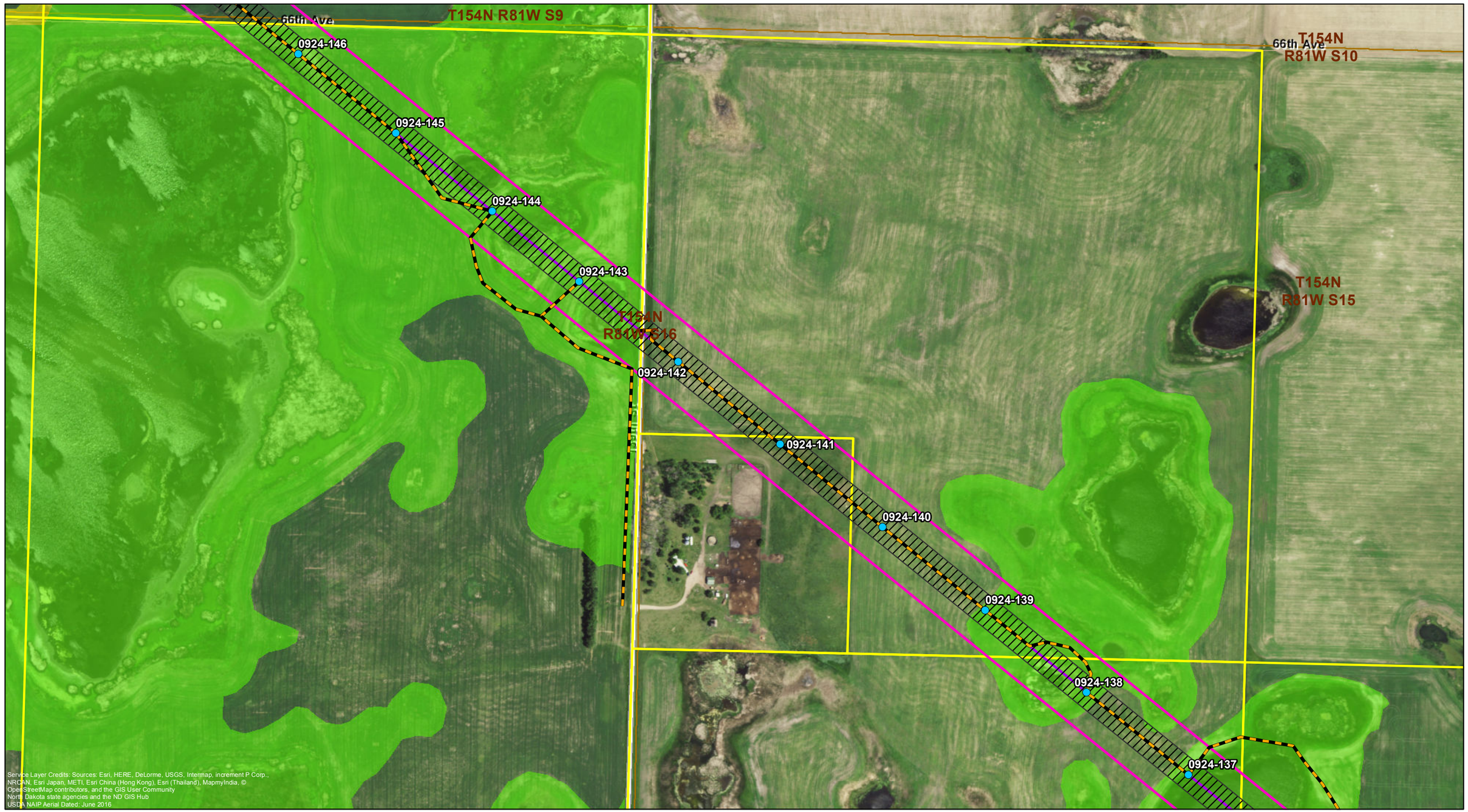
Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	6

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Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland
- USFWS Wetland Easement Wetland

Access Route

- Primary Access

N

0 200 400 Feet

Minot Load Serving Project Appendix B - Project Sheet Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	7

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Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor
- Residence within 500 Feet (Waiver signed)

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland

Access Route

- Primary Access
- Secondary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	8

T154N R81W S15

T154N R81W S14

T154N
R81W S22

T154N
R81W S23

153rd St

79th Ave

0924-131

0924-130

0924-129

0924-128

0924-127

0924-126

0924-125-DE

0924-124-DE

0924-123

0924-122

0924-121

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Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor
- Residence within 500 Feet (Waiver signed)

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland

Access Route

- Primary Access
- Secondary Access

N

0 200 400 Feet

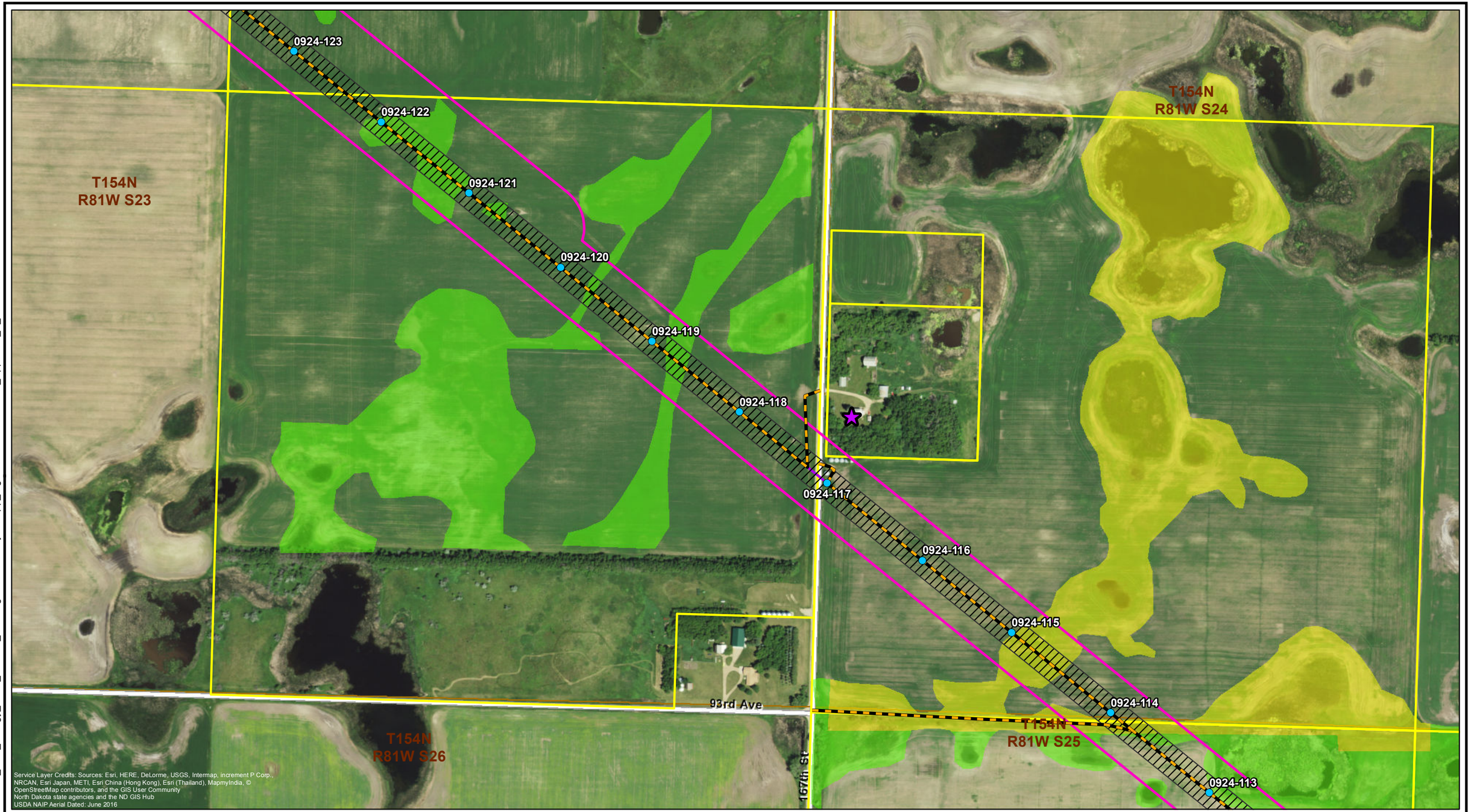
Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
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PROJECT NUMBER	60342328
SHEET MAP	9

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Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor
- Residence within 500 Feet (Waiver signed)

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland
- USFWS Wetland Easement Wetland

Access Route

- Primary Access

N

0 200 400 Feet

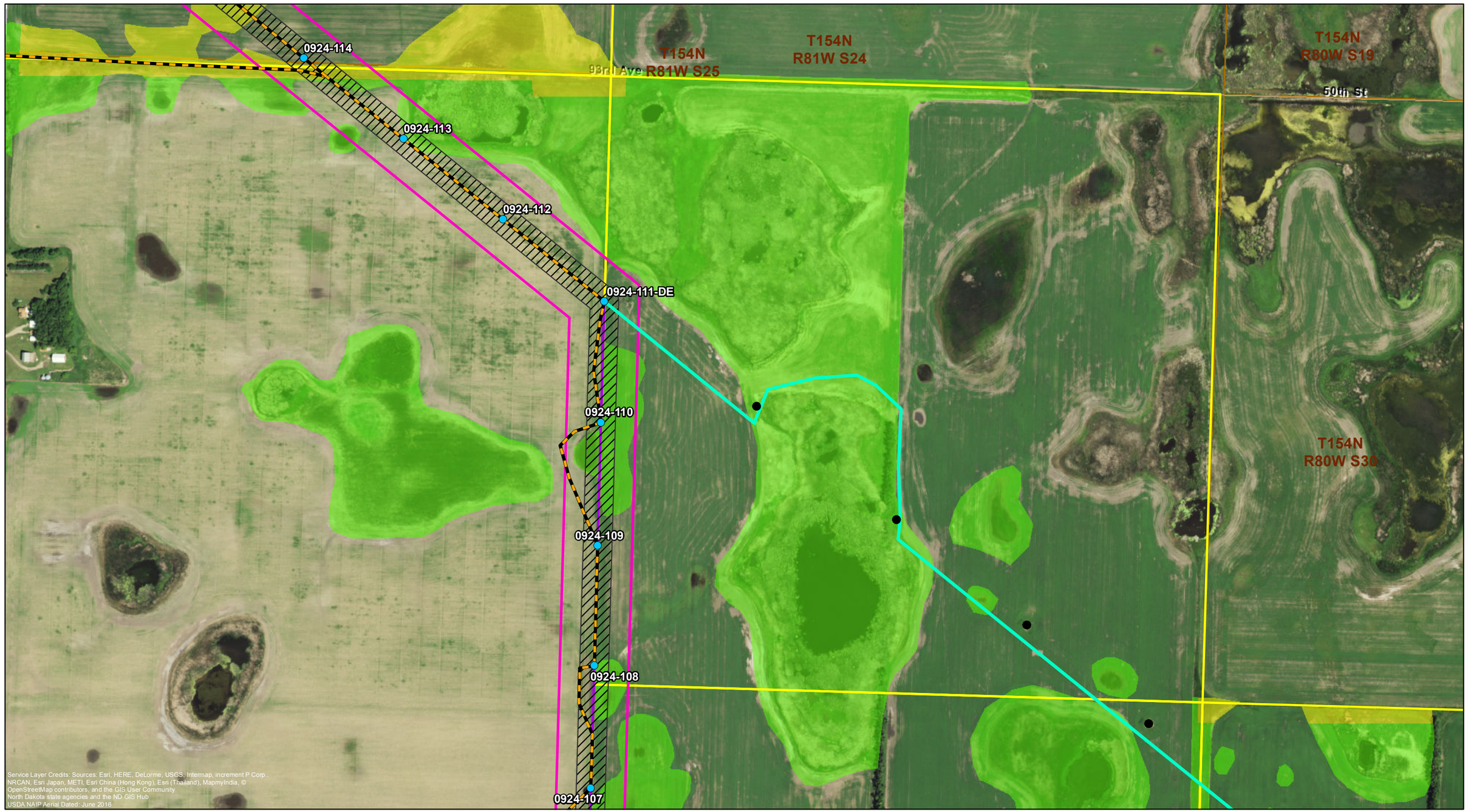
Minot Load Serving Project Appendix B - Project Sheet Map McHenry and Ward Counties, North Dakota

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Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
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Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	10

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Project Feature
- Preliminary Structure Location
- Existing Structure
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Access for Structure Removal
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

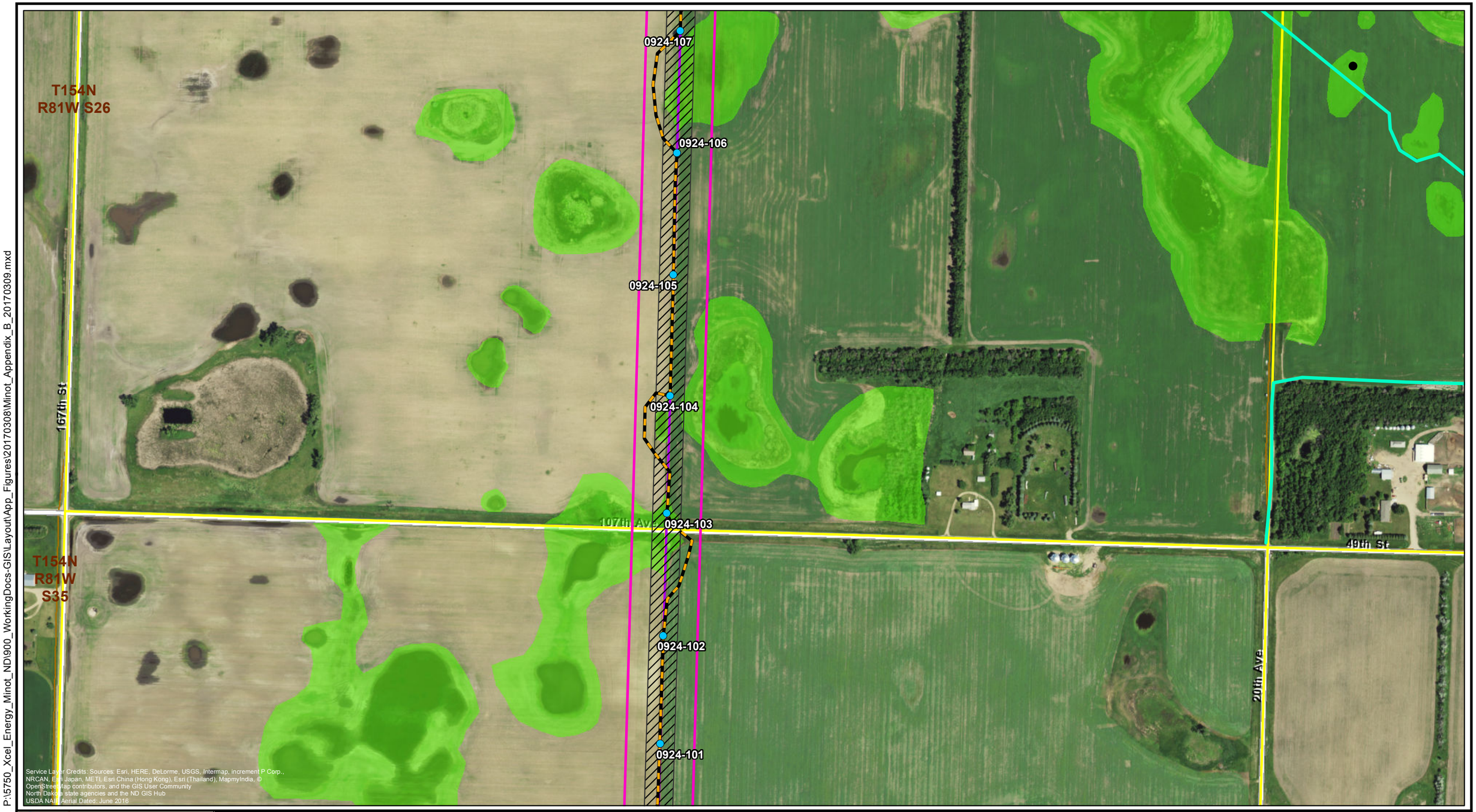
Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
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Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	11

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Project Feature
- Preliminary Structure Location
- Existing Structure
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Access for Structure Removal
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	3/9/2017
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PROJECT NUMBER	60342328	
SHEET MAP	12	

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	3/9/2017
Approved:	LHK	3/9/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	13	

T154N
R80W S31

T154N
R80W S32

0924-088
0924-087
0924-086
0924-085
0924-084
0924-083
0924-082
0924-081
0924-080-DE
0924-079
0924-078
0924-077

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Project Feature
- Preliminary Structure Location
- Existing Structure
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- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Access for Structure Removal
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
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PROJECT NUMBER	60342328
SHEET MAP	14

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0924-079
0924-078
0924-077
0924-076
0924-075-DE
0924-074
0924-073
0924-072-DE
0924-071
18th Ave
T154N
R80W S33
T153N
R80W S4
T153N
R80W S5

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Existing Structure
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Access for Structure Removal
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	3/9/2017
Approved:	LHK	3/9/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	15	

T154N
R80W S32

48th St

T154N
R80W S33

0924-071

0924-070

0924-069

0924-068

0924-067

0924-066

18th Ave

17th Ave

T153N
R80W S5

T153N
R80W S4

T153N
R80W S3

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	16

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\App_Figures\20170308\Minot_Appendix_B_20170309.mxd

T153N
R80W S4

0924-067
0924-066
0924-065
0924-064
0924-063
0924-062
0924-061
0924-060

47th St

17th Ave

T153N
R80W S9

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor
- Residence within 500 Feet (Waiver signed)

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	17

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor
- Residence within 500 Feet (Waiver signed)

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	18

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0924-052
0924-051
0924-050
0924-049
0924-048
0924-047
0924-046
0924-045
0924-044
0924-043

Velva Wind Interconnection Substation

41

46th St

T153N R80W S10
T153N R80W S11
T153N R80W S15
T153N R80W S14

13 1/2 Ave

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 115 kV Centerline
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

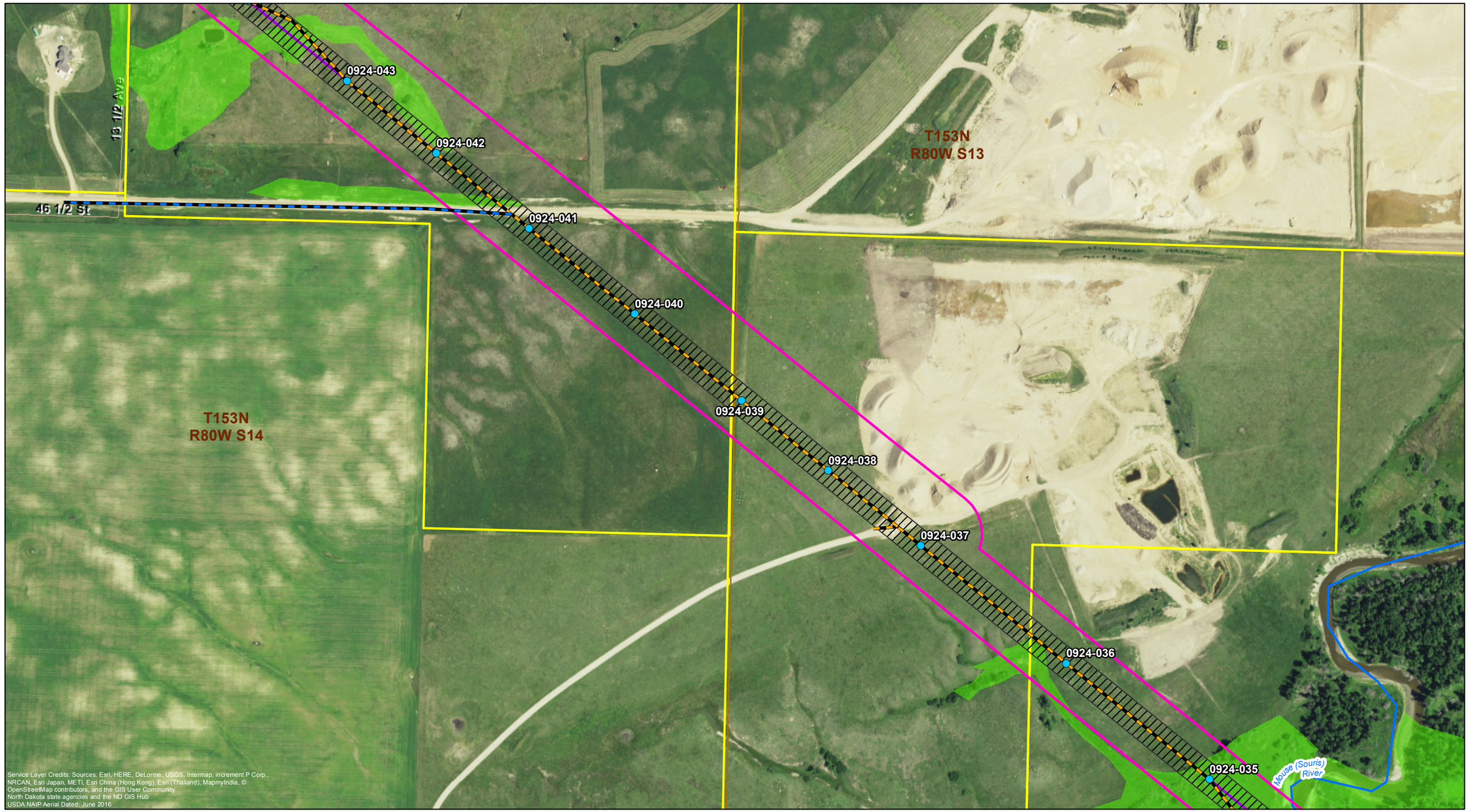
0 200 400 Feet

Minot Load Serving Project Appendix B - Project Sheet Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	19





Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Perennial)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
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PROJECT NUMBER	60342328
SHEET MAP	20

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0924-036
0924-035
0924-034
0924-033
0924-032
0924-031
0924-030
0924-029
Mouse (South) River
Valley Rd
45th St
T153N
R79W S18
T153N
R79W
S19

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor
- Residence within 500 Feet (Waiver signed)

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Perennial)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

N

0 200 400 Feet

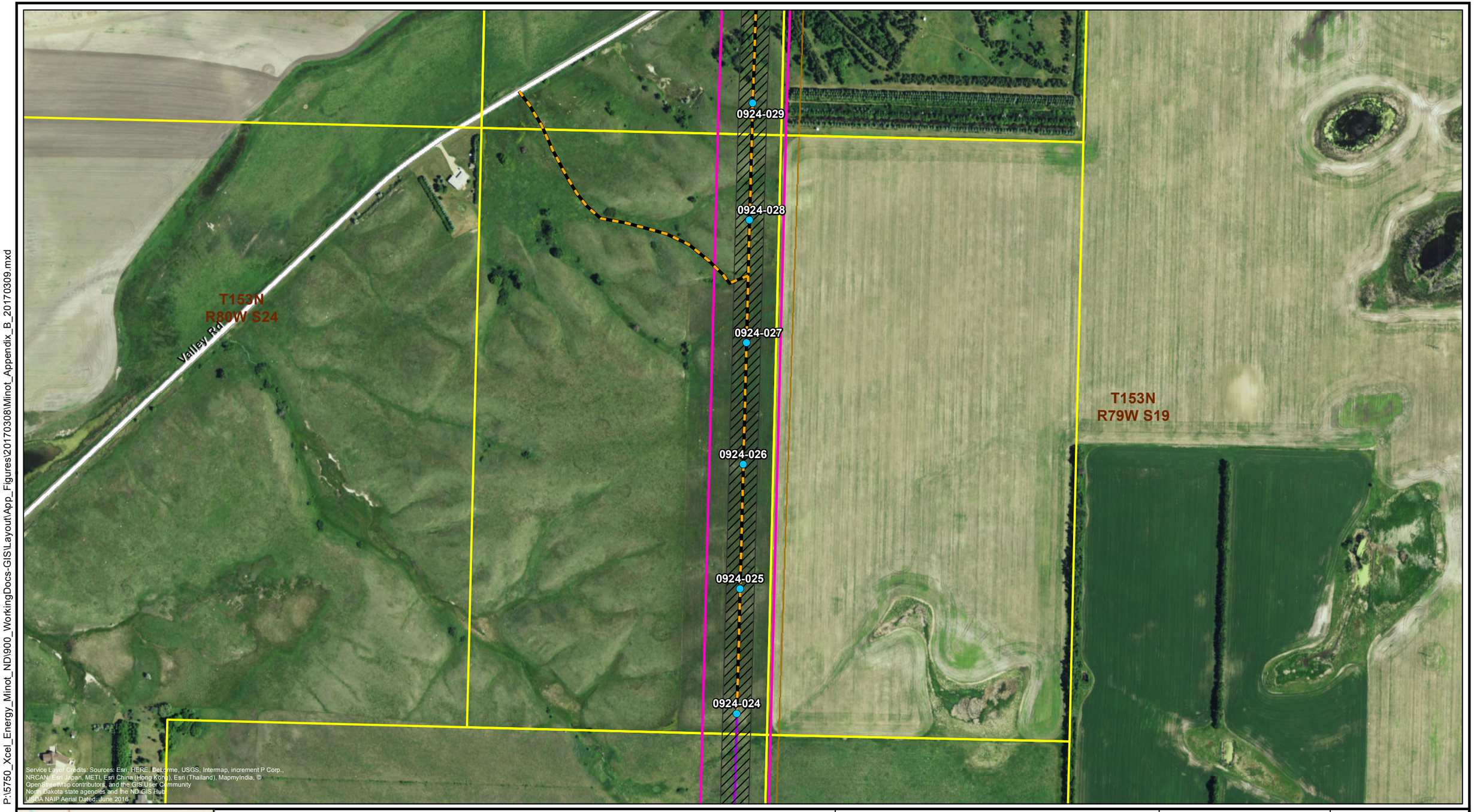
Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	21

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Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership

- Parcel Boundary

Access Route

- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	3/9/2017
Approved:	LHK	3/9/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	22	

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0924-024
0924-023
0924-022
0924-021
0924-020
0924-019
0924-018

T153N
R80W S24

T153N
R80W S25

T153N
R79W S19

T153N
R79W S30

16th Way

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North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

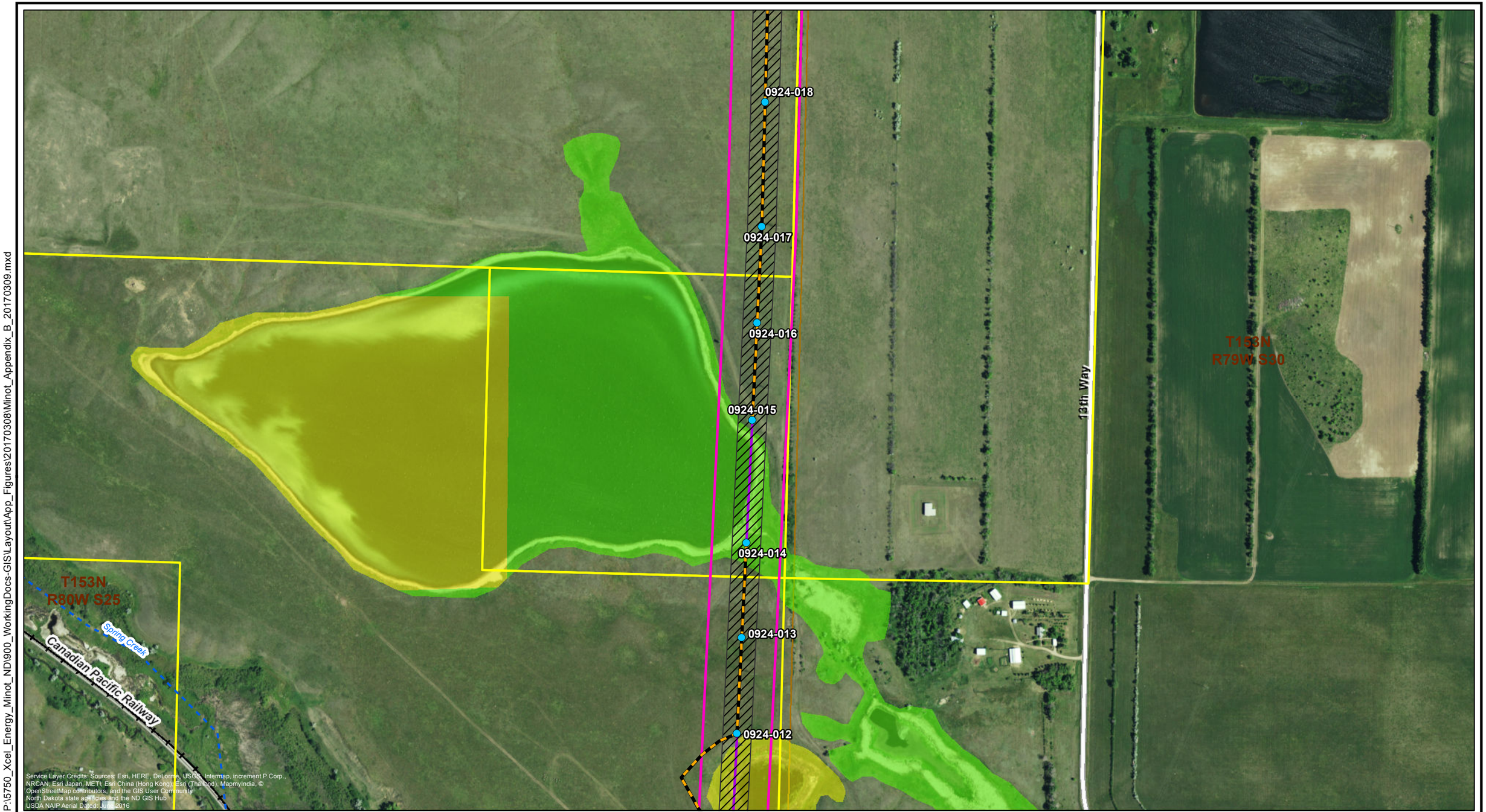
Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	3/9/2017
Approved:	LHK	3/9/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		23

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\App_Figures\20170308\Minot_Appendix_B_20170309.mxd





Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access

N

0 200 400 Feet

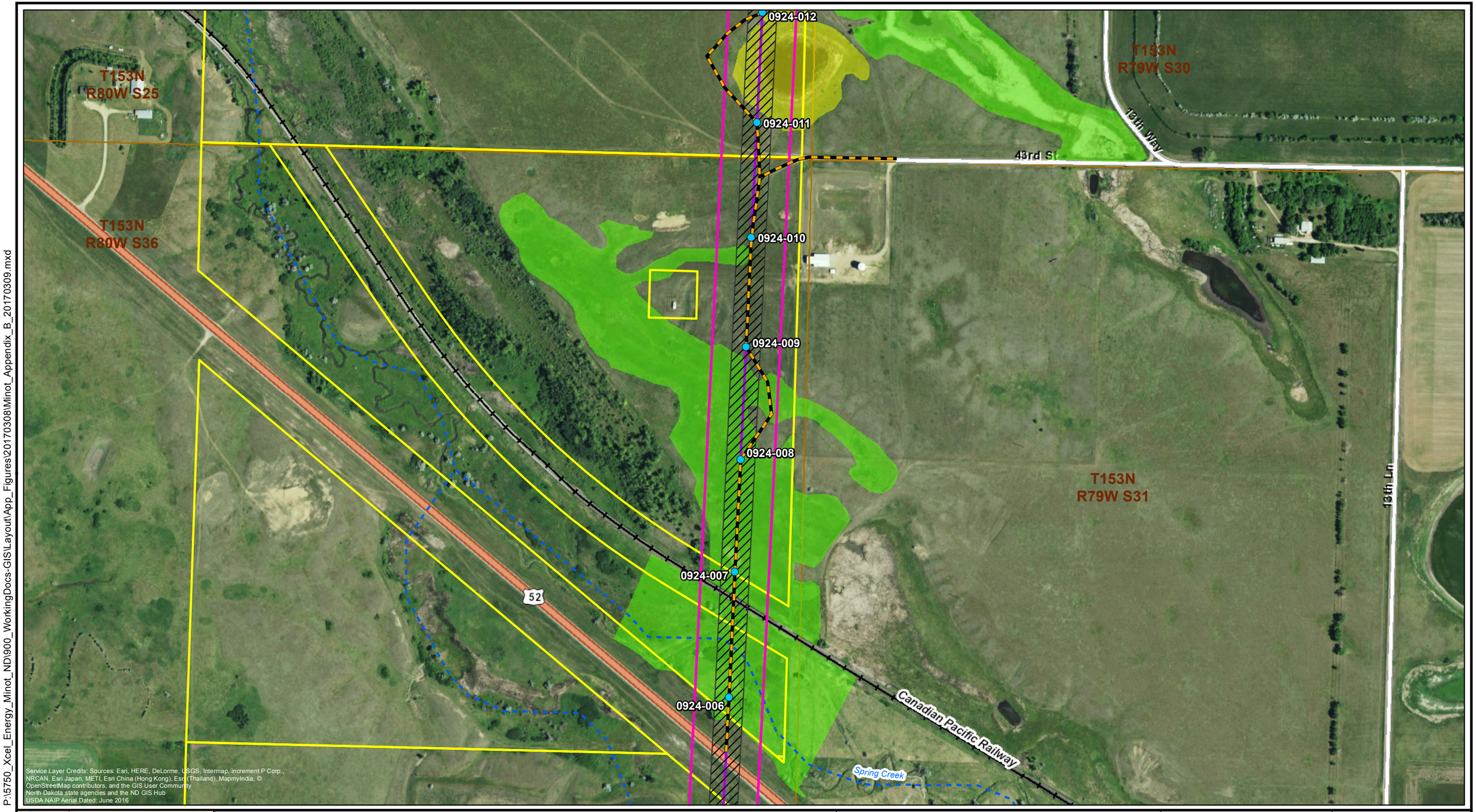
Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	24

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access

N

0 200 400 Feet

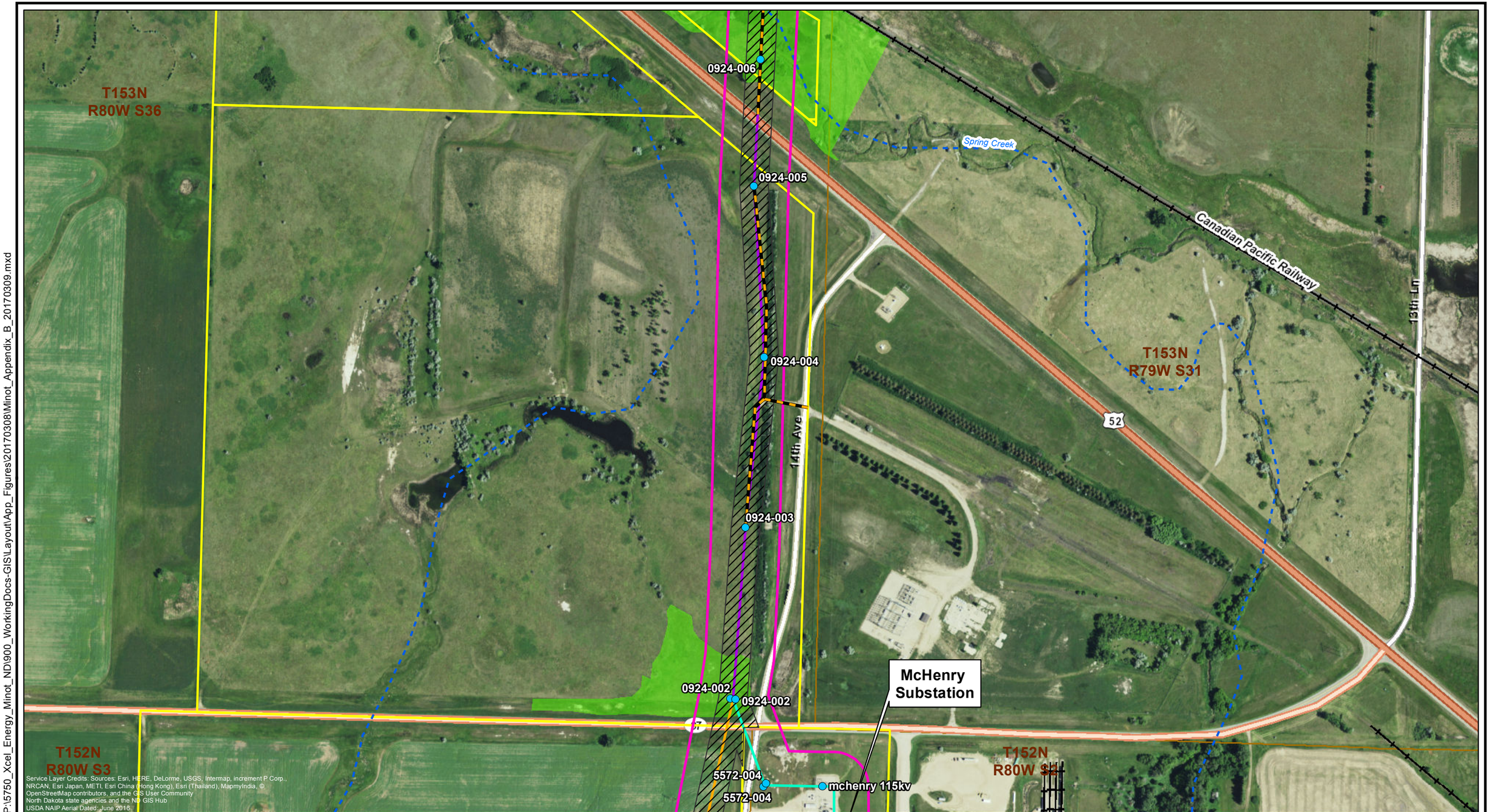
Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	25

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Project Feature
- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

N

0 200 400 Feet

Minot Load Serving Project Appendix B - Project Sheet Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	26

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T153N
R80W S36

T152N
R80W S3

T153N
R79W S31

T152N
R80W S2

0924-003

0924-002

0924-002

5572-004

5572-004

mchenry 115kv

McHenry
230kv

0924-001

McHenry
Substation

14th Ave

13th Ln

52

Spring
Creek

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North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature

- Preliminary Structure Location
- Potential Laydown Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Preliminary Right-of-Way (125 Feet)
- Project Corridor

Property Ownership

- Parcel Boundary

Stream/River

- Stream (Intermittent)

Desktop Wetland Review

- Wetland

Access Route

- Primary Access

N

0 200 400 Feet

Minot Load Serving Project
Appendix B - Project Sheet Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 3/9/2017
Approved:	LHK 3/9/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	27

Appendix C Agency Correspondence

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Table C-1. Summary of Agency Correspondence

Agency	Date of Correspondence	Information Provided	Response Date	Response Summary	Section(s) Where Response is Addressed
Federal Agencies					
U.S. Army Corps of Engineers	08/17/2016	Phone call summarizing Project and discussing USACE regulations pertaining to the Project	Not applicable	USACE provided guidance on regulations for off-site wetland review, substation site wetland delineations, the Souris River flood control program, and tree removal.	6.4
U.S. Department of Agriculture - Natural Resources Conservation Service	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	09/16/2016, 12/07/2016	NRCS provided guidance for Federally funded projects subject to the Farmland Protection Policy Act. An email follow-up on December 7, 2016 stated that the NRCS acknowledges that the Project is excluded from the Farmland Protection Policy Act because no federal funding will be used for the Project.	6.1
U.S. Fish and Wildlife Service	08/10/2016	Letter summarizing June 15, 2016 meeting with USFWS, Legal description of Project Corridor; map of Project Location	None received	Not applicable	6.6
State Agencies					
North Dakota Aeronautics Commission	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	09/08/2016	The North Dakota Aeronautics Commission stated that due to the proximity of the unverified Linrud Airstrip near Velva, North Dakota, Xcel Energy should complete the Federal Aviation Administration Form 7460-1 Notice of Proposed Construction or Alteration. Xcel Energy followed up with the North Dakota Aeronautics Commission with results of further study using an online notification tool showing that no notice was required.	6.10
North Dakota Department of Agriculture	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	None received	Not applicable	Not applicable

Table C-1. Summary of Agency Correspondence

Agency	Date of Correspondence	Information Provided	Response Date	Response Summary	Section(s) Where Response is Addressed
North Dakota Department of Health	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	08/25/16	The agency believes the environmental impacts of the Project will be minor and can be controlled by proper construction methods. Fugitive dust emissions should be minimized during construction. Impacts to streams should be avoided and disturbed areas should be revegetated. The agency attached guidelines for minimizing degradation to waterways during construction. Projects disturbing one or more acres must have a permit to discharge storm water runoff. The agency directed the Applicant to check with local officials to be sure any local storm water management considerations are addressed. Noise from construction activities can be minimized by ensuring that construction equipment is equipped with a working muffler. The agency believes the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.	6.11, 6.12
North Dakota Department of Transportation	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	08/19/16	The NDDOT stated that the Project should have no adverse effect on NDDOT highways; however, it will be necessary to complete the utility permit application process. If the Project requires any work to be done within NDDOT ROWs, the District Engineer must be contacted.	6.10
North Dakota Department of Trust Lands	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	None received	Not applicable	Not applicable

Table C-1. Summary of Agency Correspondence

Agency	Date of Correspondence	Information Provided	Response Date	Response Summary	Section(s) Where Response is Addressed
North Dakota Game and Fish Department	08/10/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	9/2/2016	NDGFD recommended that work within native prairies be avoided to the extent possible and disturbed areas be reclaimed to pre-project conditions. Steps should be taken to protect wetlands that cannot be avoided and unavoidable destruction or degradation should be mitigated in kind. Construction within the Souris River should not occur between April 15 and June 1, and erosion and sedimentation should be controlled as much as possible. Overhead lines should be marked with bird diverters near perennial streams or large wetlands. Aerial surveys for raptor nests should be conducted and a buffer of a 0.5 mile from construction should be implemented. NDGFD does not believe the Project will have significant adverse effects on wildlife or wildlife habitat provided these recommendations are implemented where appropriate.	6.2, 6.4, 6.5, 6.6
North Dakota Indian Affairs Commission	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	None received	Not Applicable	Not Applicable
North Dakota Parks and Recreation Department	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	09/02/16	The Project does not affect state park lands or state Land and Water Conservation Fund lands managed by the agency, but two snowmobile trails are crossed. No impact to these trails is anticipated. Upon review of the North Dakota Natural Heritage biological conservation database, there is one significant ecological community, a Green Ash-Elm-Box Elder floodplain forest, identified adjacent to the Project area. The NDPRD defers further comments regarding animal species to the NDGFD and the USFWS.	6.1

Table C-1. Summary of Agency Correspondence

Agency	Date of Correspondence	Information Provided	Response Date	Response Summary	Section(s) Where Response is Addressed
North Dakota State Geological Survey	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	None received	Not Applicable	Not Applicable
North Dakota State Historic Preservation Office	05/09/2015 and 02/27/2017	Class I Literature Review for Study Area and Class III Cultural Resources Inventory Report for Project Corridor and Magic City Substation.	07/05/2016 and 03/01/2017	Based upon their review of the Class I survey, SHPO recommended a Class III (pedestrian) cultural resources survey of the entire Project Area. The Project Corridor and Magic City Substation were surveyed and results of the Class III survey. SHPO concurred on March 1, 2017 that no avoidance was necessary for identified cultural resources and with a finding of *No Historic Properties Affected*.	6.7

Table C-1. Summary of Agency Correspondence

Agency	Date of Correspondence	Information Provided	Response Date	Response Summary	Section(s) Where Response is Addressed
North Dakota State Water Commission (NDSWC)	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	08/24/16	The NDSWC identified floodplains in multiple areas and stated that floodplain permitting authority has been delegated to local agencies in North Dakota. The McHenry County and Ward County floodplain administrators should be contacted regarding the Project, and their contact information was provided. Because the Project crosses the Souris River regulatory floodway northwest of the City of Velva, a floodway review from the State Engineer is required. The Office of the State Engineer should also be contacted to determine whether a Sovereign Land Permit is needed for the Project. NDSWC also stated that Xcel Energy is responsible to ensure all local, state, and federal permits are obtained and that all waste materials from the Project are properly disposed of and not placed in identified floodway areas. Xcel Energy completed the required conveyance calculations and submitted them to McHenry County on March 1, 2017. Results of the floodwater conveyance calculations show that flood conveyance would not be reduced by the Project.	6.3
Local Agencies					
North McHenry County Soil Conservation District	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	None received	Not applicable	Not applicable
Ward County Soil Conservation District	08/11/2016	Agency consultation letter; Legal description of Project Corridor; map of Project Location	None received	Not applicable	Not applicable

Table C-1. Summary of Agency Correspondence

Agency	Date of Correspondence	Information Provided	Response Date	Response Summary	Section(s) Where Response is Addressed
Souris River Joint Board	08/18/2016	Agency Consultation email, Legal description of Project Corridor	12/29/2016	Souris River Joint Board only asked for confirmation of the schedule for damages during the construction period and demolition of the old line.	3.7

U.S. Army Corps of Engineers

Tetra Tech Inc.

2001 Killebrew Dr., Suite 141 ♦ Bloomington, MN 55425 ♦ (612) 643-2200 ♦ FAX (612) 643-2201

RECORD OF COMMUNICATION

☒ TELEPHONE CONVERSATION
☐ Incoming
☒ Outgoing
☐ EMAIL

DATE: September 8, 2016
TIME: 9:00 am
RECORDED BY: Mark Rothfork
PROJECT NO.:

SUBJECT:

PARTICIPANTS (*Denotes part-time attendance)	ORGANIZATION	TELEPHONE/ext.
Toni Erhardt	USACE	Conference Call
Mark Rothfork	Tetra Tech	
John Cannon	AECOM	

SUMMARY:

A conference call regarding the Xcel Energy Minot Load Serving Project (Project) was held to discuss the use of a desktop wetland delineation for the Project corridor. Toni Erhardt of the U.S. Army Corps of Engineers (USACE) provided the USACE North Dakota Minimum Standards for Acceptance of Aquatic Resources Delineation Reports in an email. Toni verified that a desktop wetland delineation was appropriate for the Project. The document describes the desktop delineation requirements that are accepted by the USACE and that will be used for performing the desktop wetland delineation for the Project. During the conference call, the USACE stated that both temporary and permanent impacts should be identified for their review. However, temporary impacts can be educated estimates because they do not typically require mitigation if they are relatively short term. The USACE also confirmed that mitigation would only be required for permanent impacts if the Project exceeds a 1/10 acre permanent impact threshold. In addition, if the Project exceeds a ½ acre permanent impact threshold an Individual Permit would be required, rather than a Nationwide General Permit.

ACTION ITEMS	*DUE DATE*

DISTRIBUTION: ☐ PARTICIPANTS ☐ OTHER ☐ FILE

MINIMUM STANDARDS FOR ACCEPTANCE OF AQUATIC RESOURCES DELINEATION REPORTS

22 August 2016

The U.S Army Corps of Engineers, through its Regulatory Program, regulates certain activities in waters of the United States. Waters of the United States are defined under 33 CFR Part 328. In order for the Corps to determine the amount and extent of waters of the United States at a site, aquatic resources must first be delineated in accordance with established regulatory standards, guidance and protocol, such as the 1987 Corps of Engineers Wetlands Delineation Manual and appropriate regional supplements. Before making any permit decision, the Corps is responsible for conducting or verifying the delineation and determining which of the aquatic resources have the potential to fall under federal jurisdiction.

Due to limited staffing and resources, the North Dakota State Regulatory Office recommends permit applicants employ the services of individuals experienced in delineating aquatic resources. Permit applicants are encouraged early in the project planning stages to contact the Corps to determine what level of documentation is required for their project. A permit applicant should submit their aquatic resources delineation, along with a request for a preliminary or approved jurisdictional determination. Early consultation may help identify potential concerns and could result in a more prompt permit decision.

The North Dakota Regulatory Office has established minimum standards for delineation reports to insure consistency and accuracy in aquatic resources delineations, which will minimize potential delays. The standards are based on years of experience conducting and verifying delineations, as well as the best practices of environmental consultants. Delineations submitted for verification must follow the standards, unless determined to not be practical on a case-by-case basis. The Corps may determine that a desktop delineation may be appropriate instead of a full field aquatic resource delineation. A desktop delineation includes analysis of an area using current and historical aerial photographs, NRCS Soils Mapping, and NWI maps. We will not accept desktop evaluations where the only reference is NWI maps. These are only to be used as a tool to determine the potential for wetlands on-site and should not replace the use of good aerial photography. Situations where adherence to the standards may not be practical include activities with small permanent or temporary impacts to aquatic resources (under 0.10 acre), applicants with limited financial resources, and emergencies. The ND State Office will notify the requestor for delineation submittals that do not contain enough information to accurately identify the limits of waters of the United States.

An aquatic resources delineation report submitted to the North Dakota Regulatory Office must include the following:

☐ A cover letter requesting a jurisdictional determination. The letter must specify whether a preliminary or approved jurisdiction determination is requested.

☐ A signed statement from the property owner(s) allowing Corps personnel to enter the property and to collect samples during normal business hours. If the property is land-locked, the owner or proponent must obtain permission from the adjacent property owner(s) to provide access for Corps personnel.

☐ A statement that the delineation has been conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual and appropriate regional supplement(s). The regional supplement(s) used must be identified. For ordinary high water mark (OHWM) delineations, a statement identifying the use of the OHWM field guide must be included.

☐ Directions to the survey area, and the location of the Access Point of Entry.

☐ Contact information for the applicant(s), property owner(s), and agent(s).

☐ The total acreage of the survey area.

☐ Date(s) field work was completed.

☐ A site location map on a 7.5-minute USGS quadrangle. The map must provide the name of the USGS quadrangle, Section, Township, Range, and the latitude and longitude **(in decimal degrees).**

☐ A map of all delineated aquatic resources ("Aquatic Resources Delineation Map") showing the following:

- ☐ All aquatic resources delineated must be clearly shown on the map. Because only the Corps determines the regulatory status of each aquatic resource, the map must not include any labeling about jurisdiction. If the requestor believes one or more aquatic resources are not jurisdictional, the rationale should be included in the delineation report and the resource(s) should be identified on the map.
- ☐ At least one set of paired data points, documented in data forms, for each aquatic resource or complex. The paired data points must be located close to the delineated boundary. Additional data points may be necessary, depending on various factors including the size and shape of the aquatic resource, changes in vegetation communities, and slope. **The location of all data points should be shown on the wetland delineation map.**

☐ A reference block that identifies the survey or project name, individual(s) who conducted the delineation, date of the map, and date(s) of any revisions.

☐ Digital data for the site, aquatic resource boundaries, and data point locations must be provided in a geographic information system (GIS) format, with ESRI Shape-files being the preferred format. Each GIS data file must be accompanied by a metadata file containing the appropriate geographic coordinate system, projection, and datum. If GIS data is unavailable or otherwise cannot be produced and the Corps determines a site visit is necessary, the aquatic resource boundaries must be physically marked with numbered flags or stakes before the North Dakota Regulatory Office can complete a delineation verification.

☐ A table listing all aquatic resources. The table will include the name of each aquatic resource, its Cowardin type, acreage, and location (**latitude/longitude, in decimal degrees**). For linear features, the table must show both acreage and linear feet.

☐ If remote sensing was used in the delineation, provide an explanation of how it was used and include the name, date and source of the tools used and copies of applicable maps/photographs.

☐ A narrative describing all aquatic resources at the site and an explanation for the mapped boundaries, especially for resources containing complex transition zones. If the site contains resources that meet one or two wetland criteria or do not exhibit a clear OHWM, describe the rationale for not delineating these features. Examples include erosional features, upland swales, and other upland areas that appear “wet” on satellite or aerial imagery.

☐ A description of existing field conditions. The field condition description may include current land use, flood/drought conditions, irrigation practices, and any characteristics considered atypical.

☐ A discussion of the hydrology at the site, including all known surface or subsurface sources, drainage gradients, surface water connections to the nearest traditional navigable waterway or interstate water, and any potential influence for manmade water sources, such as irrigation. The discussion should also identify the nearest “blue-line” waterway or other feature found on the most recent USGS map.

☐ A discussion of plant communities and habitat types present at the site and a list of the scientific name, common name, and wetland indicator status of all plants.

☐ Soil descriptions, soil map(s), and a discussion of hydric soils or soils with hydric inclusions at the site.

☐ Any observed or documented interstate or foreign commerce associated with aquatic resources found on the site, specifically recreation or other use by interstate or foreign travelers, sale of fish or shellfish in interstate or foreign commerce, and use by industries operating in interstate or foreign commerce.

☐ A completed copy of the *Aquatic Resources Excel* spreadsheet must be submitted. For delineations that include greater than 25 separate waters, the spreadsheet will be required by the ND Regulatory Office.

☐ Completed data forms for each sample point including all essential information to make a decision.

Often, additional information can expedite the verification of a delineation. Particularly helpful data includes site specific topographic maps, National Wetland Inventory (NWI), Light Detection and Ranging (LIDAR), satellite, aerial and ground photographs, floodplain maps, and related reports.

More information regarding aquatic resource delineation, including reference materials, can be found on our website at:
http://www.nwo.usace.army.mil/Missions/RegulatoryProgram/NorthDakota.aspx

U.S. Department of Agriculture – Natural Resources Conservation Service

August 11, 2016

Mr. Jerald Wingenbach
District Conservationist
USDA - NRCS
1920 13th Street SE
Minot, ND 58503

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Wigenbach:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, and 22-25
	154 N	82 W	1 and 2
McHenry	152 N	80 W	2 and 3
	153 N	80 W	3, 4, 10, 11, 13, 14, 24, 25, and 36
	154 N	80 W	30-32

The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

USDA

United States Department of Agriculture

Natural Resources
Conservation Service

Bismarck State Office
PO Box 1458
Bismarck, ND
58502-1458

Voice 701.530.2000
Fax 855-813-7556

September 16, 2016

Xcel Energy
Attn: Mr. Tom Hillstrom, Principal Permitting Agent
414 Nicollet Mall, Suite 414-7A
Minneapolis, MN 55401

RE: Proposed Xcel Energy Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota

Dear Mr. Hillstrom:

The Natural Resources Conservation Service (NRCS) has reviewed your letter dated August 11, 2016, concerning the above mentioned project and acknowledge your request to determine whether your project affects farmland as defined in Sec. (658.2 a) of the Code of Federal Regulations (CFR) dealing with the Farmland Protection Act (FPPA). NRCS has a major responsibility with the Farmland Protection Policy Act (FPPA) in documenting conversion of farmland (i.e. prime, statewide importance and local importance) to non-agricultural use when the project utilizes federal funds. Your proposal includes construction of a transmission line and a new substation. These types of activities may remove farmland from production; therefore may be subject to FPPA. Please complete the form NRCS-CPA-106 for all areas of the transmission line outside the current right-of-way and the new substation site. (See instructions below).

Enclosed is a Farmland Conversion Impact Rating Form NRCS-CPA-106 or you may use the web based format at:
http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb1045395.pdf to record the following: Please complete Part I and III and return to Lance Duey, Area Soil Scientist located at our Devils Lake Area Office. If applicable, you may email the above information to lance.duey@nd.usda.gov. If the farmland (i.e. Prime Farmland, Statewide Importance, Local Importance) is determined to be subject to FPPA, we will then complete Parts II and IV. NRCS will measure the relative value of the site as farmland on a scale of 0 to 100 according to the information sources listed in CFR 658.5(a). If FPPA applies to this project, Form NRCS-CPA-106 will be returned to your agency for completion of Part VI, Site Assessment Criteria. Please send a copy of the completed NRCS-CPA-106 form back to NRCS for year-end reporting purposes.

Wetlands
The Wetlands Conservation Provisions of the 1985 Food Security Act, as amended, provide that if a USDA participant converts a wetland for the purpose or to have the effect of making agricultural production possible, loss of USDA benefits could occur. The NRCS has developed the following guidelines for the

installation of permanent structures where wetlands occur. If these guidelines are followed, the impacts to the wetland will be considered minimal allowing USDA participants to continue to receive USDA benefits. Following are the requirements:

- Disturbance to the wetland must be temporary.
- No drainage of wetland is allowed (temporary or permanent).
- Mechanized landscaping necessary for installation is kept to a minimum and preconstruction contours are maintained.
- Temporary side cast material must be placed in such a manner not to be dispersed in the wetland.
- All trenches must backfilled to the original wetland bottom elevation.

NRCS recommends that impacts to wetlands be avoided. If the alignment of the project requires passage through a wetland, NRCS can complete a certified wetland determination if requested by the landowner/operator.

If you have additional questions pertaining to FPPA, please contact Steve Sieler, Liaison Soil Scientist, NRCS, Bismarck, ND, at (701) 530-2019. Thank you.

Sincerely,



WADE D. BOTT
State Soil Scientist

From: Sieler, Steve - NRCS, Bismarck, ND [mailto:steve.sieler@nd.usda.gov]
Sent: Wednesday, December 07, 2016 9:09 AM
To: Rothfork, Mark <Mark.Rothfork@tetratech.com>
Subject: RE: Xcel Energy - Minot Load Serving 230 Kilovolt Transmission line Project

Mark,

Yes, I have received your email and concur that your transmission line project is not supported by federal funding. The lack of federal funding excludes this project from the Farmland Protection Policy Act.

Please let me know if you have additional questions.

Steven J. Sieler

Steven J. Sieler
State Soil Liaison
Natural Resources Conservation Service
United States Department of Agriculture
220 East Rosser Avenue
Post Office Box 1458
Bismarck North Dakota, 58502-1458
701-530-2019

From: Rothfork, Mark [mailto:Mark.Rothfork@tetratech.com]
Sent: Tuesday, December 06, 2016 8:45 AM
To: Sieler, Steve - NRCS, Bismarck, ND <steve.sieler@nd.usda.gov>
Subject: RE: Xcel Energy - Minot Load Serving 230 Kilovolt Transmission line Project

Hi Steve,

I just wanted to verify that you received my email last week. Thank you.

~Mark

Mark Rothfork, PMP | Environmental Planner/Project Manager
Cell **+1 (763) 257-6821** | Direct **+1 (612) 643-2223** | Main **+1 (612) 643-2200** | mark.rothfork@tetratech.com

---

From: Rothfork, Mark
Sent: Thursday, December 01, 2016 4:33 PM
To: 'steve.sieler@nd.usda.gov' <steve.sieler@nd.usda.gov>
Subject: Xcel Energy - Minot Load Serving 230 Kilovolt Transmission line Project

Steve,

It was a pleasure speaking with you this morning regarding the Xcel Energy - Minot Load Serving 230 Kilovolt Transmission line Project (Project). Thank you for verifying that the Project will not require the submittal of Form NRCS-CPA-106 since it is not a federally funded project. Your response to this email will be used to show that you concur that form NRCS-CPA-106 is not required for the Project. Thanks again and if you have any additional questions feel free to contact me.

~Mark

Mark Rothfork, PMP | Environmental Planner/Project Manager
Cell **+1 (763) 257-6821** | Direct **+1 (612) 643-2223** | Main **+1 (612) 643-2200** | mark.rothfork@tetratech.com

U.S. Fish and Wildlife Service

August 10, 2016

Mr. Kevin Shelley
Acting ND Field Supervisor
USFWS North Dakota Field Office
3425 Miriam Avenue
Bismarck, North Dakota 58501-7926

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Shelley:

The purpose of this letter is to follow up our June 15th meeting with USFWS staff in your office in Bismarck. Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

Project Background

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, and 22-25
	154 N	82 W	1 and 2
McHenry	152 N	80 W	2 and 3
	153 N	80 W	3, 4, 10, 11, 13, 14, 24, 25, and 36
	154 N	80 W	30-32

The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

June 15th Meeting

On June 15, 2016, Xcel staff met with U.S. Fish and Wildlife Service (USFWS) staff, Jessica Johnson and Terry Ellsworth, in Bismarck North Dakota. The purpose of the meeting was to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed below that would influence a decision regarding the use of the land, as well as applicable permits that may be

required from USFWS.

Below is brief summary of the meeting:

- The USFWS Information for Planning and Conservation (IPaC) website official species list was reviewed. A desktop review for Dakota skipper habitat was completed and provided to the USFWS prior to the meeting. Xcel will complete a reconnaissance level review of the alignment and access routes for potential Dakota skipper habitat during the wetland delineations. USFWS is currently working on survey protocol for the Dakota skipper but is sure when it would be available. USFWS agreed that having a biologist review the Project for native prairie during the wetland delineations was a good plan. If native prairie is found and skipper surveys are necessary, a survey plan should be submitted to USFWS for review and approval prior to undertaking the surveys.

- There is potential Whooping crane stopover habitat located along the Project. The Project appears to have a small piece located with the 75 percent sighting corridor with the majority of the Project located in the 95 percent sighting corridor. The USFWS recommendation regarding Whooping cranes for a transmission line rebuild project would be to install bird diverters for all areas of the line that are within 1 mile of suitable stopover habitat (shallow wetlands).

- Xcel will continue to work with the appropriate USFWS District staff regarding the wetland easements that are located along the proposed Project. It is Xcel's understanding that a Nationwide Permit would be needed from the U.S. Army Corps of Engineers (USACE) for a few structures that would be within wetlands that are too large to span. There are also a few wetlands that are located on the substation site and Xcel will coordinate with the USACE regarding any wetland impacts. There is no federal nexus for the Project.

- The USFWS identified an eagle nest near the Souris River on the southwest side of the river. The location was marked with Google Earth. Eagle nest GIS data is available from the North Dakota Game and Fish Department (NDGFD) and will be requested by Xcel. USFWS recommends that a ½ mile buffer be used around the nest so the eagles are not disturbed. However, USFWS thought this could possibly be reduced because the trees in the area provide good screening. USFWS asked if construction could take place near the eagle nest in September to avoid impacts and Xcel responded that was an option.

- USFWS indicated that the Sprague's pipit can be removed from the list.

- USFWS stated Gray wolves have been sighted in McHenry County, but that Project would not permanently impact the wolf or its habitat.

- The Project is located outside the white nose syndrome zone for Northern long-eared bat.

- USFWS recommended that Xcel clear and mow areas outside of the migratory bird nesting season. Also, USFWS recommends that if tree clearing occurs during nesting season, a biologist review the corridor 5 days before tree clearing begins to locate any nests. If nests are found they should be flagged and avoided so the nest is not disturbed.

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the USACE and NDGFD.

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,



Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

414 Nicollet Mall
Minneapolis, MN 55401

DATE/TIME	Wednesday June 15, 2016, 10:00 am
LOCATION	U.S. Fish and Wildlife Service, 3425 Miriam Avenue Bismarck, North Dakota
	Magic City to McHenry 230 Kilovolt (kV) Project

ATTENDEES

Xcel Energy	Tom Hillstrom, Noel Klinnert, Tim Rogers
USFWS	Jessica Johnson and Terry Ellsworth
AECOM	Mark Rothfork

The goal of the meeting was to provide background and a description of the Magic City to McHenry 230 kV Project (Project) and to gather input from the U.S. Fish and Wildlife Service (USFWS).

Project Background

Tom Hillstrom provided an introduction and an update on the Project. Tom also distributed a schematic showing the existing single circuit (115 kV) H-frame wood structure and the proposed double circuit (115/230 kV) single pole steel structure. Xcel held a public meeting near the Project Area in December of 2015 to get input from landowners. Landowners voiced some concern regarding having two sets of structures parallel to each other and having to farm around them. Xcel listened to the landowners and decided to go with the double circuit on single steel poles.

Xcel will continue to work with the appropriate USFWS district staff regarding the wetland easements that are located along the Project. Tom stated that a Nationwide Permit would be needed from the U.S. Army Corps of Engineers (USACE) for a few structures that would be within wetlands that are too large to span. There are also a few wetlands that are located on the substation site and Xcel will coordinate with the USACE regarding any wetland impacts. There is no federal nexus for the Project.

A KMZ of the Project alignment was reviewed during the meeting. Terry mentioned that there was an eagle nest near the Souris River on the southwest side. The location was marked with Google Earth. Terry also stated that eagle nest GIS data was available from the North Dakota Game and Fish Department (NDGFD). USFWS recommends that a ½ mile buffer be used around the nest so the eagles are not disturbed. However, Terry thought this could possibly be reduced because the trees in the area provide good screening. Terry also asked if construction could take place near the eagle nest in September to avoid impacts and Noel responded that was an option.

The list of protected species provided in the memo was reviewed. The Dakota skipper prefers native prairie habitat that contains the correct assemblage of plants. Tom mentioned that a desktop review of the Project area was completed and that a reconnaissance level review of the alignment and access routes would be completed during the wetland delineations. Jessica said that Kevin Shelley is currently working on survey protocol for the Dakota skipper and she is not sure when it would be available. Jessica also agreed that having a biologist review the project for native prairie during the wetland delineations is a good plan. If native prairie is found, a survey plan should be submitted to USFWS for review and approval prior to undertaking the surveys.

USFWS indicated that the Sprague's pipit can be removed from the list.

There is potential Whooping crane stopover habitat located along the Project. The Project appears to have a small piece located with the 75 percent sighting corridor with the majority of the Project located in the 95 percent sighting corridor. Mark asked if a shapefile of the sighting corridor could be provided and Jessica said she would email it to him. The USFWS recommendation regarding Whooping cranes for a transmission line rebuild project would be to install bird diverters for all areas of the line that are within 1 mile of suitable stopover habitat (shallow wetlands).

Terry did mention that there have been sightings of the Gray wolf in McHenry County but that the Project would not permanently impact the wolf or its habitat. Terry also provided contact information for Stephanie Tucker, a fur bearer specialist with the NDGFD.

The Project is located outside the white nose syndrome zone for Northern long-eared bat.

Terry recommended that Xcel clear and mow areas outside of the nesting season for migratory birds. Also, USFWS recommends that if tree clearing occurs during nesting season, a biologist review the corridor 5 days before construction begins to locate any nests. If nests are found they should be flagged and avoided so the nest is not disturbed.

Permitting Process

The Certificate of Public Convenience and Necessity (CPCN) application will be ready for submittal to the North Dakota Public Service Commission (ND PSC) in a few months. After the CPCN application is submitted, Xcel is planning on submitting the local and state permit applications in early 2017. It is anticipated that those permits would require approximately 3 to 4 months for approval which would allow for construction to begin in September 2017.

Questions

Tim asked if it was possible to get a disturbance permit for working near the eagle nest. Terry stated that based on his experience with the Denver USFWS office that it was not likely that they would approve a disturbance permit.

Handout Materials:

- Xcel Energy Magic City to McHenry 230 kV Project Overview Map
- Xcel Energy Structure Schematic

Rothfork, Mark

From: Beyer, Jonathan <jonathan_beyer@fws.gov>
Sent: Tuesday, October 04, 2016 9:16 AM
To: Hillstrom, Thomas G
Cc: John_Takala@fws.gov; Rothfork, Mark; Marquardt, Jeffrey D; Klinnert, Noel G; Lawler, Sean W
Subject: Re: FW: Xcel Powerline SE of Minot
Attachments: 20161003161454.pdf

Tom-

Thank you for making the adjustments to your original proposal to avoid easement wetlands in the portion of the Excel Energy Project that I am responsible for reviewing (i.e. Ward County).

From discussions we have had and your email, I understand you are concerned that the landowner may provide some "push back" on the placement of the power poles. I also understand it is Excel Energy's intent to avoid all wetland impacts related to this project. From discussions we have had, it is also my understanding that Excel is proposing to place the power poles as close to the wetland edge as possible without causing impacts to occur to easement protected wetlands.

I have reviewed your most recent proposal (i.e. 2nd proposal) of pole placements within Ward County and have determined that the proposal will avoid USFWS wetland easement interests while also providing a small buffer for your construction team to complete this project. Because you have requested to place the poles as close to the wetland as possible, I have placed two yellow dots on the attached map where poles could be constructed and still avoid USFWS easement interests (see attached map). Placing the poles at the locations of the yellow dots would significantly limit the amount of construction space your team would have to work with during placement of the poles. Your original/1st proposal (green dots on the attached map) will impact USFWS wetland easement interests.

Concerning tillage and USFWS wetland easements, farming of wetlands including digging, plowing, etc. is allowed by the provisions of the wetland easement contract. The wetland easement contract also allows for water levels in the wetlands to expand and contract as they have during the past several years.

Poles 108 and 109 within the Alvin Finneseth property are outside of easement protected wetland basins, and therefore I have no objection with your pole placement on the Finneseth property as proposed.

Please let me know if you have additional questions or concerns regarding this project. Thank you for your efforts to avoid easement impacts. Please send me your final proposal so I can document your decision in my file.

Jon Beyer
Wetland District Manager
Audubon National Wildlife Refuge
3275 11th St NW
Coleharbor, ND 58531
Office Phone: 701-442-5474 ext 116

On Mon, Oct 3, 2016 at 1:41 PM, Hillstrom, Thomas G <Thomas.Hillstrom@xcelenergy.com> wrote:

Hi John,

As we discussed, we are providing some additional information. Attached is a zip file containing mapping of structure locations and a wetland boundary based on the 2014 (wet) aerial photo.

John Takala,

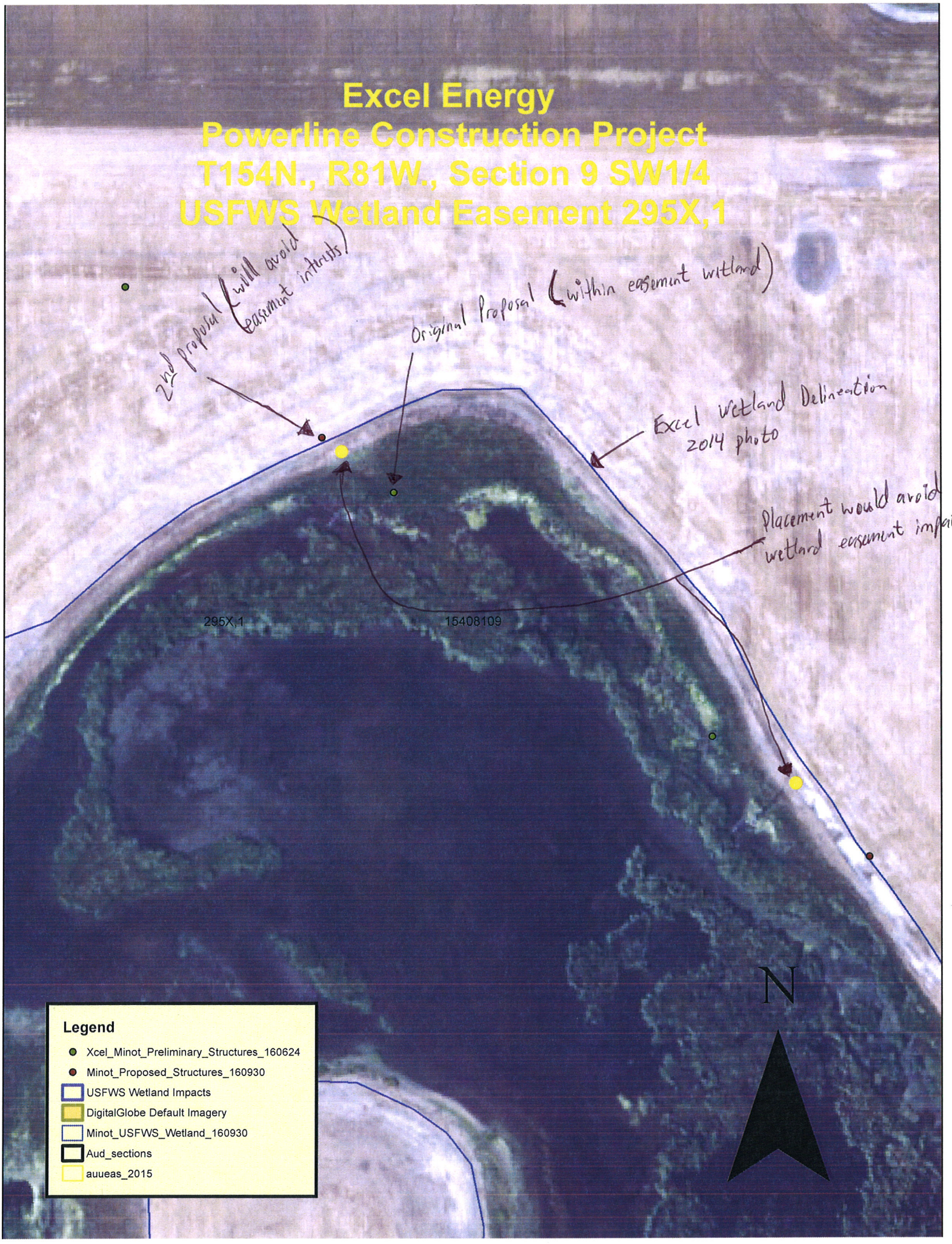
At structure 146-147 (Martha Klein property), we mapped wetlands using the wet 2014 year and find that avoiding this boundary puts the poles
Approximately 40 to 50 feet in the current tilled area. We expect some pushback from the landowner for this placement. Please take a look at the attached pdf file showing detail pole locations here. The new line would be built on the north side of the old line at this location and the old line would be removed. We'd like to get an approved and final pole location worked out with you and the landowner so these pole locations can be locked in.
Can you also confirm that poles 108 and 109 are outside of wetlands on the Alvin Finneseth property?

John Beyer,

Poles 9 and 10 on the Krumwiede property are more of a challenge to avoid the mapped wetland. You mentioned that you may have some wetland boundary revisions here. One option may be to move structure 10 to higher ground. Can you provide a new boundary for the wetland near Structure 10? Maybe the best way to work this out would be a conference call with our engineer. I plan on being in the area soon (possibly next week) , maybe we could meet at the site.

Thanks you both for helping us through this.

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com


Excel Energy
Powerline Construction Project
T154N., R81W., Section 9 SW1/4
USFWS Wetland Easement 295X,1
2nd Proposal (will avoid easement intrusts)
Original Proposal (within easement wetland)
Excel wetland Delineation 2014 photo
Placement would avoid wetland easement impacts
295X,1
15408109
N
Legend
Xcel_Minot_Preliminary_Structures_160624
Minot_Proposed_Structures_160930
USFWS Wetland Impacts
DigitalGlobe Default Imagery
Minot_USFWS_Wetland_160930
Aud_sections
auueas_2015

Rothfork, Mark

From: Takala, John <john_takala@fws.gov>
Sent: Tuesday, October 04, 2016 11:49 AM
To: Hillstrom, Thomas G
Cc: Beyer, Jonathan; Rothfork, Mark; Marquardt, Jeffrey D; Klinnert, Noel G; Lawler, Sean W
Subject: Re: FW: Xcel Powerline SE of Minot

Tom,

Poles 9 and 10 on the Krumwiede property are located in what I would classify as wet meadow, which is not typically a wetland type that would be protected by a USFWS wetland easement. There is an easement protected basin approximately 40 feet west of pole 10. If the location of pole 10 does not change the project will not impact USFWS easement protected wetlands. Please contact me f you have any other questions.

Thanks,
John

John Takala
Wetland District Manager/Federal Wildlife Officer

J Clark Salyer WMD
681 Salyer Road
Upham, ND 58789
701 768-2548 ext 114 Office
701 768-2834 Fax
701 500-1388 Cell

On Mon, Oct 3, 2016 at 1:41 PM, Hillstrom, Thomas G <Thomas.Hillstrom@xcelenergy.com> wrote:

> Hi John,
>
> As we discussed, we are providing some additional information. Attached is a zip file containing mapping of structure locations and a wetland boundary based on the 2014 (wet) aerial photo.
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> John Takala,
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> Can you also confirm that poles 108 and 109 are outside of wetlands on the Alvin Finneseth property?
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> Poles 9 and 10 on the Krumwiede property are more of a challenge to avoid the mapped wetland. You mentioned that you may have some wetland boundary revisions here. One option may be to move structure 10 to higher ground. Can you provide a new

boundary for the wetland near Structure 10? Maybe the best way to work this out would be a conference call with our engineer. I plan on being in the area soon (possibly next week) , maybe we could meet at the site.

Thanks you both for helping us through this.

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

North Dakota Aeronautics Commission

August 11, 2016

Mr. Kyle Wanner
Director
North Dakota Aeronautics Commission
P.O. Box 5020
Bismarck, North Dakota 58502

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Wanner:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, and 22-25
	154 N	82 W	1 and 2
McHenry	152 N	80 W	2 and 3
	153 N	80 W	3, 4, 10, 11, 13, 14, 24, 25, and 36
	154 N	80 W	30-32

The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Aeronautics Commission (NDAC).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

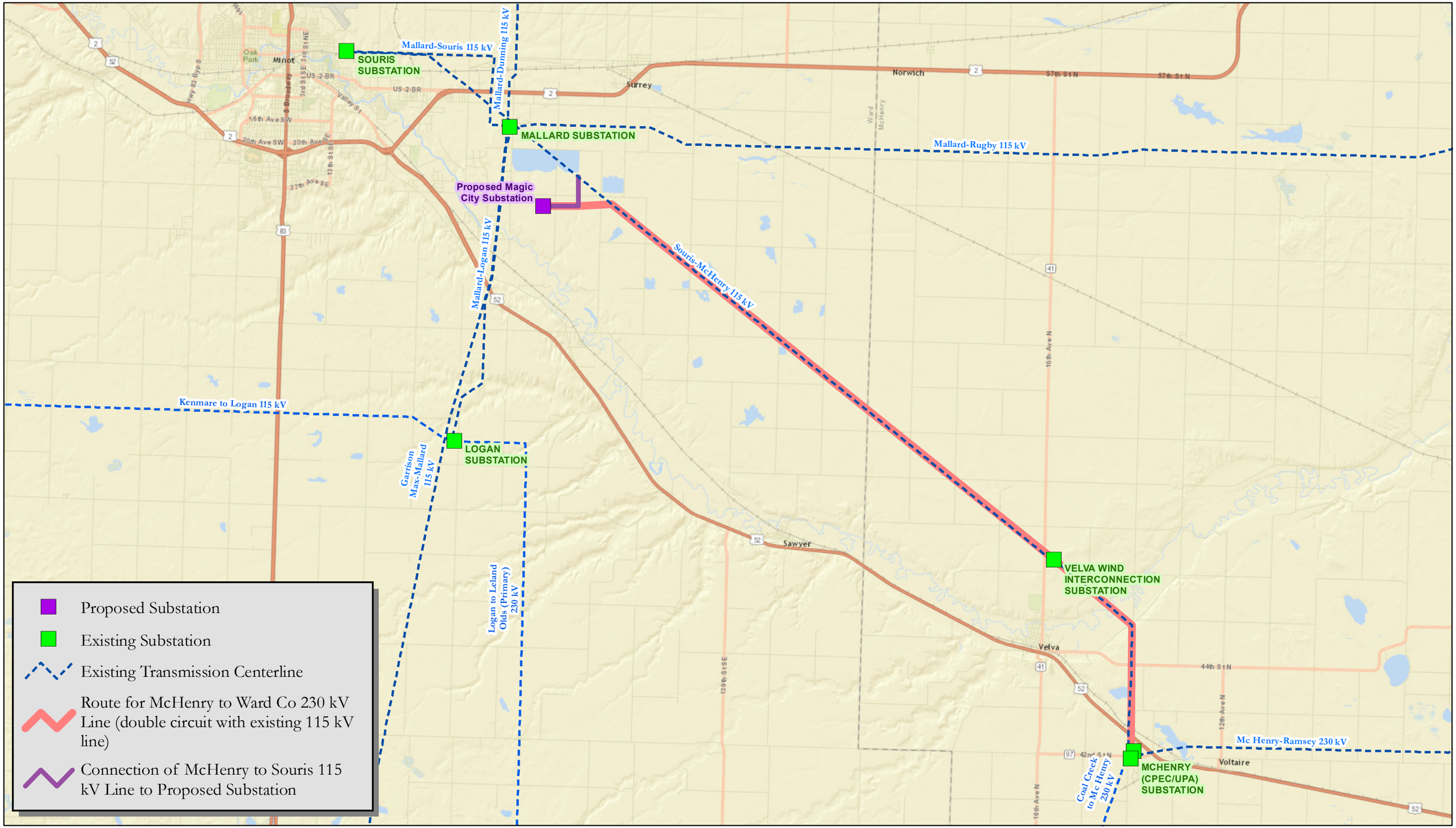
Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

Document Path: S:\General-Offices-GO-Trans\SLR-Mapping\GIS_Projects_2015\Minot\Minot Load Serving Project.mxd

PDF path:S:\General-Offices-GO-Trans\SLR-Project-Warehouse\Archived Projects (Pre-2015)\Active_Projects\Transmission-New\Minot 230kV\Maps\LoadServingMap.pdf



0 1.5 3 Miles

1:125,000

N

Minot Load Serving Project

Xcel Energy® RESPONSIBLE BY NATURE™

8 September 2016

Response sent
8 Sep 2016
JCW

Tom Hillstrom
Principal Permitting Agent
Xcel Energy
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

Dear Mr. Hillstrom,

I am writing in response to your company's correspondence concerning the Proposed Magic City Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota.

Upon initial review of the proposed project boundary, the North Dakota Aeronautics Commission has the following recommendation, based upon the unverified Linrud Airstrip, north of Velva, North Dakota.

1) Complete the Federal Aviation Administration (FAA) Form 7460-1 NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION. The form can be found here: http://www.faa.gov/documentLibrary/media/Form/FAA_Form_7460-1_2017.pdf

Please give me a call if you have any additional comments, concerns, and/or questions.

Sincerely,

Jared L. Wingo

Airport Planner
North Dakota Aeronautics Commission
Office: (701) 328-9655
Email: jwingo@nd.gov

From: Wingo, Jared L. [mailto:jwingo@nd.gov]
Sent: Tuesday, November 22, 2016 8:42 AM
To: Rothfork, Mark <Mark.Rothfork@tetratech.com>
Subject: RE: Minot 230 kV Transmission Line Project

Mark,

Thanks for letting us review the Project.

The NDAC does not have any further comments at this time.

Good luck completing the project!

Take care,

Jared L. Wingo

Airport Planner
North Dakota Aeronautics Commission
Work: (701) 328-9655
Cell: (701) 471-5548
Fax: (701) 328-9656
Email: jwingo@nd.gov
Website: http://www.aero.nd.gov

From: Rothfork, Mark [mailto:Mark.Rothfork@tetratech.com]
Sent: Tuesday, November 22, 2016 8:39 AM
To: Wingo, Jared L. <jwingo@nd.gov>

Subject: Minot 230 kV Transmission Line Project

Jared,

Thank you for taking the time and talking with me this morning. As we discussed, the Minot 230 kV Transmission Line Project (Project) was reviewed using the Federal Aviation Administration (FAA) Obstruction Evaluation Version 2016.4.2 online Notification Tool. The results of the review are attached and determined that no notice criteria was exceeded. Please let me know if concur with the results of the FAA assessment. Thanks again and if you have any questions feel free to give me a call.

~Mark

Mark Rothfork, PMP | Environmental Planner/Project Manager
Cell **+1 (763) 257-6821** | Direct **+1 (612) 643-2223** | Main **+1 (612) 643-2200** | mark.rothfork@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | Environmental Services Divisions
2001 Killebrew Drive, Suite 141 | Bloomington, MN 55425 | tetratech.com

Federal Aviation Administration

The system will be going offline at 7pm ET on Thursday, October 27, 2016 for upgrades. We apologize for any inconvenience.

« OE/AAA

Notice Criteria Tool

Notice Criteria Tool - Desk Reference Guide V_2014.2.0

The requirements for filing with the Federal Aviation Administration for proposed structures vary based on a number of factors: height, proximity to an airport, location, and frequencies emitted from the structure, etc. For more details, please reference CFR Title 14 Part 77.9.

You must file with the FAA at least 45 days prior to construction if:

- your structure will exceed 200ft above ground level
- your structure will be in proximity to an airport and will exceed the slope ratio
- your structure involves construction of a traverseway (i.e. highway, railroad, waterway etc...) and once adjusted upward with the appropriate vertical distance would exceed a standard of 77.9(a) or (b)
- your structure will emit frequencies, and does not meet the conditions of the FAA Co-location Policy
- your structure will be in an instrument approach area and might exceed part 77 Subpart C
- your proposed structure will be in proximity to a navigation facility and may impact the assurance of navigation signal reception
- your structure will be on an airport or heliport
- filing has been requested by the FAA

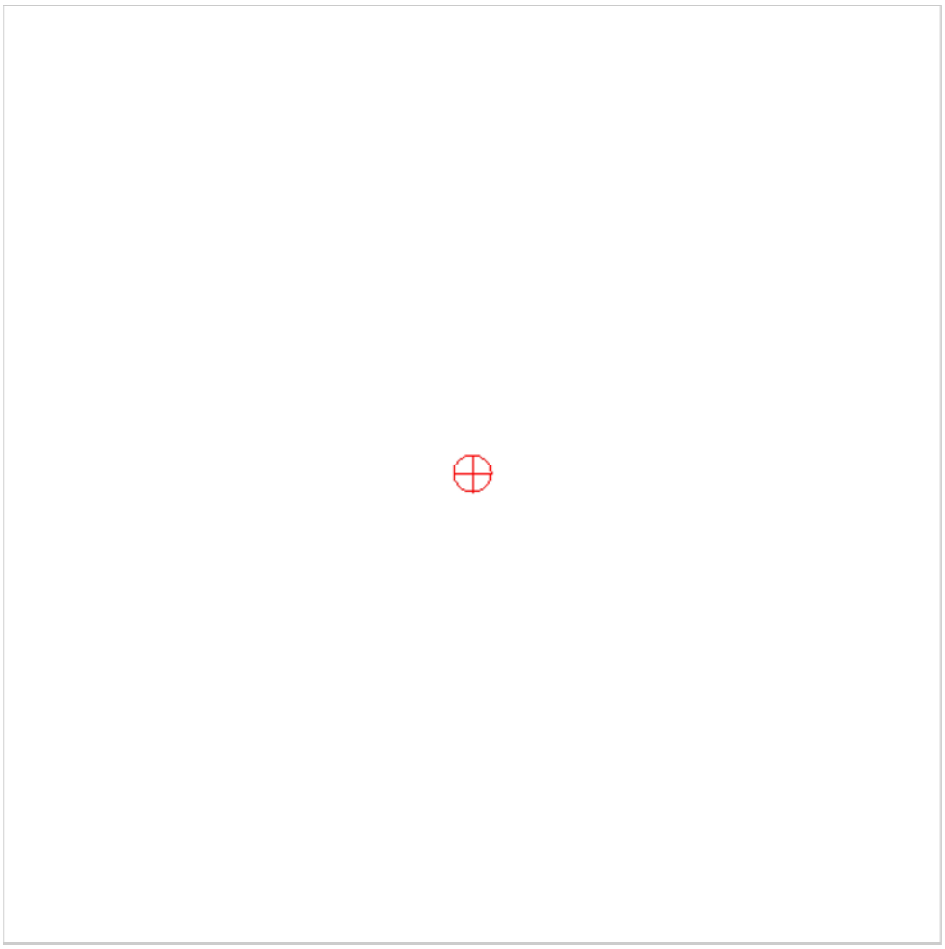
If you require additional information regarding the filing requirements for your structure, please identify and contact the appropriate FAA representative using the Air Traffic Areas of Responsibility map for Off Airport construction, or contact the FAA Airports Region / District Office for On Airport construction.

The tool below will assist in applying Part 77 Notice Criteria.

Latitude:	48 Deg 6 M 22.91 S N
Longitude:	100 Deg 58 M 6.198 S W
Horizontal Datum:	NAD83
Site Elevation (SE):	1619 (nearest foot)
Structure Height :	130 (nearest foot)
Traverseway:	No Traverseway (Additional height is added to certain structures under 77.9(c)) User can increase the default height adjustment for Traverseway, Private Roadway and Waterway
Is structure on airport:	(•) No ( ) Yes

Results

You do not exceed Notice Criteria.



North Dakota Department of Agriculture

August 11, 2016

Mr. Doug Goehring
Agriculture Commissioner
North Dakota Department of Agriculture
600 East Boulevard Avenue, Department 602
Bismarck, North Dakota 58505

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Goehring:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, and 22-25
	154 N	82 W	1 and 2
McHenry	152 N	80 W	2 and 3
	153 N	80 W	3, 4, 10, 11, 13, 14, 24, 25, and 36
	154 N	80 W	30-32

The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Department of Agriculture (NDDA).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

North Dakota Department of Health

August 11, 2016

Dr. Terry Dwelle, M.D., M.P.H.T.M.
State Health Officer
North Dakota Department of Health
600 East Boulevard Avenue
Bismarck, North Dakota 58505

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Dr. Dwelle:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

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The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Department of Health (NDDH).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
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Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

August 25, 2016

Mr. Tom Hillstrom
Xcel Energy
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

Re: Magic City Substation to McHenry Substation 230/115 kV Transmission Line Project
Ward and McHenry Counties, North Dakota

Dear Mr. Hillstrom:

This department has reviewed the information concerning the above-referenced project submitted under date of August 11, 2016, with respect to possible environmental impacts.

This department believes that environmental impacts from the proposed construction will be minor and can be controlled by proper construction methods. With respect to construction, we have the following comments:

1. All necessary measures must be taken to minimize fugitive dust emissions created during construction activities. Any complaints that may arise are to be dealt with in an efficient and effective manner.

2. Care is to be taken during construction activity near any water of the state to minimize adverse effects on a water body. This includes minimal disturbance of stream beds and banks to prevent excess siltation, and the replacement and revegetation of any disturbed area as soon as possible after work has been completed. Caution must also be taken to prevent spills of oil and grease that may reach the receiving water from equipment maintenance, and/or the handling of fuels on the site. Guidelines for minimizing degradation to waterways during construction are attached.

3. Projects disturbing one or more acres are required to have a permit to discharge storm water runoff until the site is stabilized by the reestablishment of vegetation or other permanent cover. Further information on the storm water permit may be obtained from the Department's website or by calling the Division of Water Quality (701-328-5210). Also, cities may impose additional requirements and/or specific best management practices for construction affecting their storm drainage system. Check with the local officials to be sure any local storm water management considerations are addressed.

4. Noise from construction activities may have adverse effects on persons who live near the construction area. Noise levels can be minimized by ensuring that construction equipment is equipped with a recommended muffler in good working order. Noise effects can also be minimized by ensuring that construction activities are not conducted during early morning or late evening hours.

The department owns no land in or adjacent to the proposed improvements, nor does it have any projects scheduled in the area. In addition, we believe the proposed activities are consistent with the State Implementation Plan for the Control of Air Pollution for the State of North Dakota.

If you have any questions regarding our comments, please feel free to contact this office.

Sincerely,

L. David Glatt, P.E., Chief
Environmental Health Section

LDG:cc
Attach.

NORTH DAKOTA
DEPARTMENT of HEALTH

ENVIRONMENTAL HEALTH SECTION
Gold Seal Center, 918 E. Divide Ave.
Bismarck, ND 58501-1947
701.328.5200 (fax)
www.ndhealth.gov

Construction and Environmental Disturbance Requirements

These represent the minimum requirements of the North Dakota Department of Health. They ensure that minimal environmental degradation occurs as a result of construction or related work which has the potential to affect the waters of the State of North Dakota. All projects will be designed and implemented to restrict the losses or disturbances of soil, vegetative cover, and pollutants (chemical or biological) from a site.

Soils

Prevent the erosion of exposed soil surfaces and trapping sediments being transported. Examples include, but are not restricted to, sediment dams or berms, diversion dikes, hay bales as erosion checks, riprap, mesh or burlap blankets to hold soil during construction, and immediately establishing vegetative cover on disturbed areas after construction is completed. Fragile and sensitive areas such as wetlands, riparian zones, delicate flora, or land resources will be protected against compaction, vegetation loss, and unnecessary damage.

Surface Waters

All construction which directly or indirectly impacts aquatic systems will be managed to minimize impacts. All attempts will be made to prevent the contamination of water at construction sites from fuel spillage, lubricants, and chemicals, by following safe storage and handling procedures. Stream bank and stream bed disturbances will be controlled to minimize and/or prevent silt movement, nutrient upsurges, plant dislocation, and any physical, chemical, or biological disruption. The use of pesticides or herbicides in or near these systems is forbidden without approval from this Department.

Fill Material

Any fill material placed below the high water mark must be free of top soils, decomposable materials, and persistent synthetic organic compounds (in toxic concentrations). This includes, but is not limited to, asphalt, tires, treated lumber, and construction debris. The Department may require testing of fill materials. All temporary fills must be removed. Debris and solid wastes will be removed from the site and the impacted areas restored as nearly as possible to the original condition.

North Dakota Department of Transportation

August 11, 2016

Mr. James Redding
District Engineer
North Dakota Department of Transportation, Minot District
1305 Highway 2 Bypass East
Minot, ND 58701-7922

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Redding:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

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The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Department of Transportation (NDDOT).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

North Dakota Department of Transportation

Grant Levi, P.E.
Director

Jack Dalrymple
Governor

August 19, 2016

Tom Hillstrom
Xcel Energy
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

APPLICATION FOR CERTIFICATE OF CORRIDOR COMPATIBILITY AND TRANSMISSION FACILITY ROUTE PERMIT FOR PROPOSED MAGIC CITY SUBSTATION TO MCHENRY SUBSTATION TRANSMISSION LINE PROJECT, WARD COUNTY, MINOT, NORTH DAKOTA

We have reviewed your August 11, 2016, letter.

This project should have no adverse effect on the North Dakota Department of Transportation highways; however, it will be necessary to complete the utility permit application process.

Additionally, if because of this project any work needs to be done on highway right of way, appropriate permits and risk management documents will need to be obtained from the Department of Transportation District Engineer, Jim Redding, Minot at 701-837-7625.

for ROBERT A. FODE, P.E., DIRECTOR – OFFICE OF PROJECT DEVELOPMENT

57\raf\js
c: Jim Redding, Minot District Engineer

North Dakota Department of Trust Lands

August 11, 2016

Mr. Lance Gaebe
Commissioner
North Dakota Department of Trust Lands
P.O. Box 5523
Bismarck, ND 58506

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Gaebe:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

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The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Department of Trust Lands (NDDTL).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

North Dakota Game and Fish Department

August 10, 2016

Mr. Terry Steinwand
Director
North Dakota Game and Fish Department
100 North Bismarck Way
Bismarck, North Dakota 58501

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Steinwand:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

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The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed below that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Game and Fish Department (NDGFD).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,



Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

"VARIETY IN HUNTING AND FISHING"

NORTH DAKOTA GAME AND FISH DEPARTMENT

100 NORTH BISMARCK EXPRESSWAY BISMARCK, NORTH DAKOTA 58501-5095 PHONE 701-328-6300 FAX 701-328-6352

September 2, 2016

Tom Hillstrom
Principal Permitting Agent
Xcel Energy
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

Dear Mr. Hillstrom:

RE: Proposed Magic City Substation to McHenry Substation 230/115 kV Transmission Line
Ward & McHenry Counties, North Dakota

The North Dakota Game and Fish Department has reviewed this project for wildlife concerns.

A primary concern is the possible disturbance of native prairie during construction of the transmission line. Avoidance of native prairie areas reduces impacts to a number of grassland species including many of the species of conservation priority. We ask that work within native prairie be avoided to the extent possible, and disturbed areas be reclaimed to pre-project conditions.

The National Wetland Inventory indicates a variety of wetlands within the proposed project corridor. Steps should be taken to protect any wetlands that cannot be avoided, alterations should not be made to existing drainage patterns, and above-ground appurtenances should not be placed in wetland areas. Unavoidable destruction or degradation of wetland acres should be mitigated in kind.

The transmission line will cross the Souris River, a Class I fishery resource. Construction activities should not take place within the waterway between April 15 and June 1 to protect the resource, and controls should be implemented to minimize possible erosion and sedimentation.

We recommend that overhead lines be marked when placed over perennial streams or sited in close proximity to large wetland complexes to minimize possible avian impacts. The publication "Reducing Avian Collisions with Power Lines: the State of the Art in 2012" provides a range of management options which can be used to reduce avian losses.

Our records indicate two bald eagle nests located in close proximity to the proposed project corridor. We suggest that aerial surveys be conducted for raptor nests before construction begins, and recommend that a ½-mile construction buffer be implemented around active eagle nest sites (known occupied within the past 5 years). Ms. Sandra Johnson, Conservation Biologist, may be contacted at 701-328-6327 for additional information on eagle nest sites in the state.

We do not believe this project will have significant adverse effects on wildlife or wildlife habitat, including species of conservation priority, provided these recommendations are implemented where appropriate.

Sincerely,

Greg Link
Chief
Conservation & Communication Division

js

North Dakota Indian Affairs Commission

August 11, 2016

Mr. Scott Davis
Executive Director
North Dakota Indian Affairs Commission
600 East Boulevard Avenue,
1st Floor – Judicial Wing, Room #117
Bismarck, ND 58505

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Davis:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

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The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Indian Affairs Commission (NDIAC).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

North Dakota Parks and Recreation Department

August 11, 2016

Mr. Mark Zimmerman
Director
North Dakota Parks and Recreation Department
1600 E. Century Ave, Suite 3
Bismarck, ND 58503

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Zimmerman:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, and 22-25
	154 N	82 W	1 and 2
McHenry	152 N	80 W	2 and 3
	153 N	80 W	3, 4, 10, 11, 13, 14, 24, 25, and 36
	154 N	80 W	30-32

The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota Parks and Recreation Department (NDPRD).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

Jack Dalrymple, Governor
Mark A. Zimmerman, Director

1600 East Century Avenue, Suite 3
Bismarck, ND 58503-0649
Phone 701-328-5357
Fax 701-328-5363
E-mail parkrec@nd.gov
www.parkrec.nd.gov

September 2, 2016

Xcel Energy
Tom Hillstrom
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

Dear Mr. Hillstrom:

The North Dakota Parks and Recreation Department has reviewed the above referenced proposed Magic City Substation to McHenry Substation Transmission Line project in Ward and McHenry Counties.

Our agency scope of authority and expertise covers recreation and biological resources (in particular rare plants and ecological communities). The project as defined does not affect state park lands that we manage but or affect state Land and Water Conservation Fund (LWCF) project sites that we manage. The proposed line does intersect two snowmobile trails but is does not appear that there will be any negative impacts to these trail.

The North Dakota Natural Heritage biological conservation database has been reviewed to determine if any current or historical plant or animal species of concern or other significant ecological communities are known to occur within an approximate one-mile radius of the project area. Based on this review a significant ecological community occurrence has been identified adjacent to the project areas. Please see the attached spreadsheet and maps for more specific information on these species. We defer further comments regarding animal species to the North Dakota Game and Fish Department and the United States Fish and Wildlife Service. Please refer to the map showing location of both the snowmobile trails and ecological community.

Because this information is not based on a comprehensive inventory, there may be species of concern or otherwise significant ecological communities in the area that are not represented in the database. The lack of data for any project area cannot be construed to mean that no significant features are present. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

The Department recommends that the project be accomplished with minimal impacts and that all efforts be made to ensure that critical habitats not be disturbed in the project area to help secure rare species conservation in North Dakota. Regarding any reclamation efforts, we recommend that any impacted areas be revegetated with species native to the project area.

It is our policy to charge requests for data services including data retrieval, data analysis, manual and computer searches, packaging and collection of data. An invoice for services provided has been enclosed.

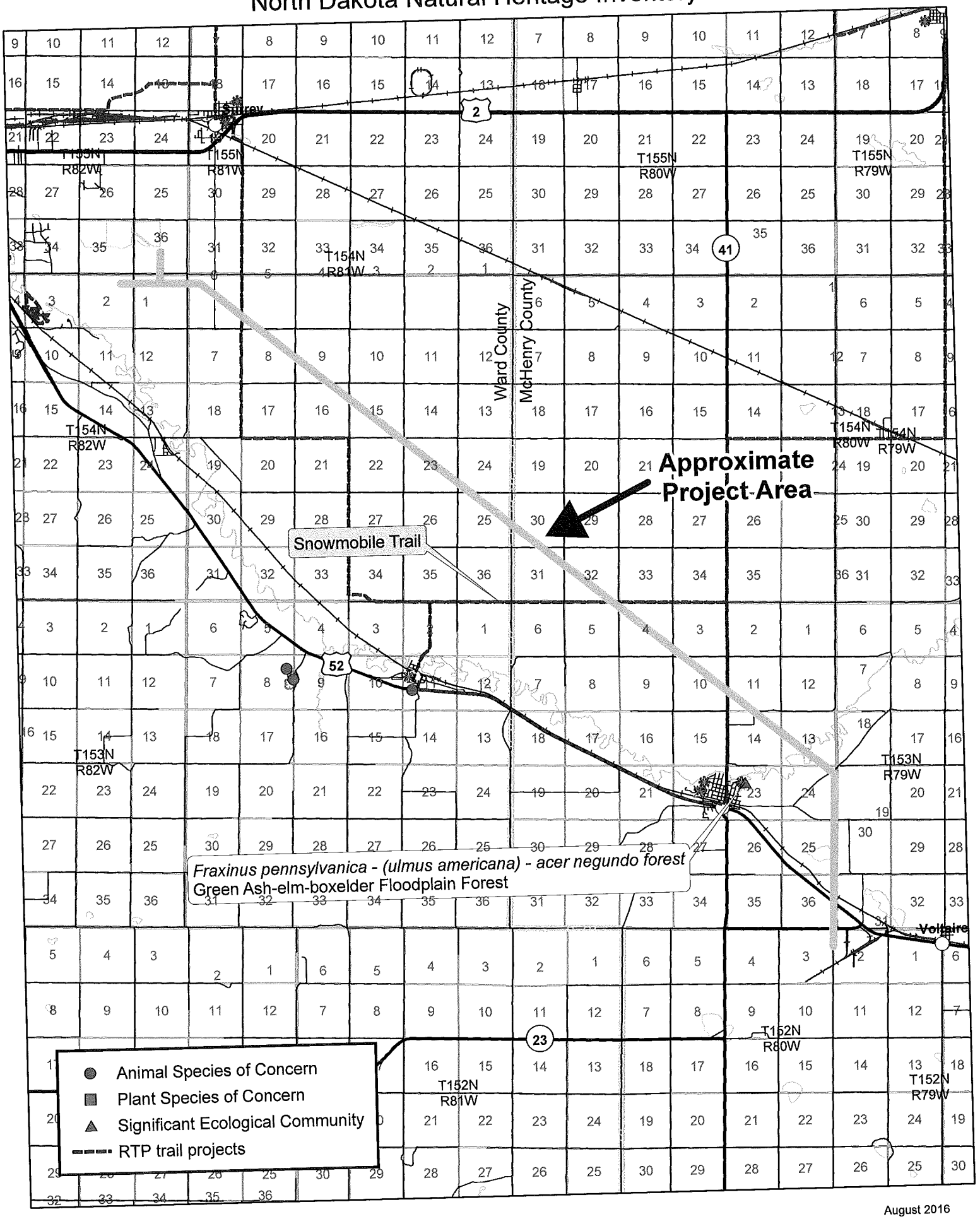
We appreciate your commitment to rare plant, animal and ecological community conservation, management and inter-agency cooperation to date. For additional information please contact me at (701-328-5370 or kgduttenhefner@nd.gov. Thank you for the opportunity to comment on this proposed project.

Sincerely,

Kathy Duttenhefner, Coordinator/Biologist
Natural Resources Division

R.USNDNHI*2016_228 KD9.2.2016DL9.2.2016

North Dakota Parks and Recreation Department
North Dakota Natural Heritage Inventory



August 2016

North Dakota Natural Heritage Inventory

Rare Animal and Plant Species and Significant Ecological Communities

State Scientific Name	State Common Name	State Rank	Global Rank	Federal Status	Township Range Section	County	Last Observation	Estimated Representation Accuracy	Precision
Fraxinus pennsylvanica - (ulmus americana) - acer negundo forest	Green Ash-elm-boxelder Floodplain Forest	S1S2	GNR		153N080W - 23	McHenry	1984-06-14		S

Recreation Trails Program Projects

Project Name
Snowmobile Trail

North Dakota Natural Heritage Inventory Biological and Conservation Data Disclaimer

The quantity and quality of data collected by the North Dakota Natural Heritage Inventory are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in North Dakota have never been thoroughly surveyed, and new species are still being discovered. For these reasons, the Natural Heritage Inventory cannot provide a definite statement on the presence, absence, or condition of biological elements in any part of North Dakota. Natural Heritage data summarize the existing information known at the time of the request. Our data are continually upgraded and information is continually being added to the database. This data should never be regarded as final statements on the elements or areas that are being considered, nor should they be substituted for on-site surveys.

Estimated Representation Accuracy

Value that indicates the approximate percentage of the Element Occurrence Representation (EO Rep) that was observed to be occupied by the species or community (versus buffer area added for locational uncertainty). Use of estimated representation accuracy provides a common index for the consistent comparison of EO reps, thus helping to ensure that aggregated data are correctly analyzed and interpreted.

Very high (>95%)
High (>80%, <= 95%)
Medium (>20%, <= 80%)
Low (>0%, <= 20%)
Unknown
(null) - Not assessed

Precision

A single-letter code for the precision used to map the Element Occurrence (EO) on a U.S. Geological Survey (USGS) 7.5' (or 15') topographic quadrangle map, based on the previous Heritage methodology in which EOs were located on paper maps using dots.

S - Seconds: accuracy of locality mappable within a three-second radius; 100 meters from the centerpoint
M - Minute: accuracy of locality mappable within a one-minute radius; 2 km from the centerpoint
G - General: accuracy of locality mappalbe to map or place name precision only; 8 km from centerpoint
U - Unmappable

North Dakota State Geological Survey

August 11, 2016

Mr. Edward Murphy
State Geologist
North Dakota State Geological Survey
600 East Boulevard Avenue
Bismarck, ND 58505

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Murphy:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

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The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota State Geological Survey (NDSGS).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

North Dakota State Water Commission

August 11, 2016

Mr. Todd Sando
State Engineer
North Dakota State Water Commission
900 East Boulevard Avenue, Dept. 770
Bismarck, ND 58505

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Mr. Sando:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

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The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from North Dakota State Water Commission (NDSWC).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

North Dakota State Water Commission

900 EAST BOULEVARD AVENUE, DEPT 770 • BISMARCK, NORTH DAKOTA 58505-0850
(701) 328-2750 • TTY 1-800-366-6888 or 711 • FAX (701) 328-3696 • http://swc.nd.gov

August 24, 2016

Tom Hillstrom
Xcel Energy
414 Nicollet Mall 414-6A
Minneapolis, MN 55401

Dear Mr. Hillstrom:

This is in response to your request for review of environmental impacts associated with the Magic City Substation to McHenry Substation 230/115 kilovolt Transmission Line Project located in Ward and McHenry counties, ND.

The proposed project has been reviewed by State Water Commission staff and the following comments are provided:

- There are floodplains identified along both proposed route lines. Without more precise information on the location of the project, detailed maps cannot be provided, however one FIRMette has been provided for the approximate location of the proposed Magic City Substation. The areas are designated to be in Zone A and Zone AE. North Dakota has no formal "permitting" authority as a state entity in National Flood Insurance Program (NFIP) identified floodplain areas. The permitting is always done by the local entity, which has jurisdiction in the area in question. Please work closely with the City Floodplain Administrator. The Ward County Floodplain Administrator is: Amber Turnquest; 701-838-2810 or 701-838-3801; amber.turnquest@wardnd.com. The McHenry County Floodplain Administrator is: Darlene Carpenter; 701-537-5724; dcarpenter@nd.gov.

- The project also appears to take place in the regulatory floodway of the Mouse (Souris) River northwest of the City of Velva, which carries additional requirements per North Dakota Century Code 61-16.2-14. Before authorizing any development, the community responsible for permitting such use shall request a floodway review from the State Engineer.

- A Sovereign Land Permit may be needed from the Office of the State Engineer for the project. Please contact Jerry Heiser at 701-328-4935 regarding permit requirements. An application is enclosed for your convenience.

- It is the responsibility of the project sponsor to ensure that local, state and federal agencies are contacted for any required approvals, permits, and easements.

- All waste material associated with the project must be disposed of properly and not placed in identified floodway areas.

Thank you for the opportunity to provide review comments. If you have any questions, please call me at 701-328-4967.

Sincerely,

Michael Noone
Natural Resource Economist

MN:dm/1570
Encl.

JACK DALRYMPLE, GOVERNOR
CHAIRMAN

GARLAND ERBELE, P.E.
CHIEF ENGINEER-SECRETARY

APPLICATION FOR AUTHORIZATION TO CONSTRUCT A PROJECT WITHIN ISLANDS AND BEDS OF NAVIGABLE STREAMS AND WATERS

Office of the State Engineer
900 East Boulevard
Bismarck, ND 58505-0850

Permit No. _____

Project No. 1625

Date
Received Stamp
Location

SWC USE ONLY

I, the undersigned, do hereby submit the following information to the Office of the State Engineer as an application to construct a project that may impact islands and beds of navigable streams and waters of North Dakota under NDCC Chapter 61-33.

GENERAL INFORMATION:

This Application must include a map from an actual survey, aerial photo or topographic map and plot map (if a development). The size of the map shall be 8½ by 11 inches. The map shall have a north arrow and approximate scale. Indicate the existing or proposed work on the drawing. Plans and specifications must be submitted if project includes construction work.

(1) Project will be located in the: _____ Water Resource District

(2) Legal description to the nearest 40 acre tract: _____ ¼ _____ ¼ Section _____ Township _____ Range _____

(3) Is this application for modification of an existing project ❒Yes ❒No If so, what year was project constructed: _____

By whom: _____

(4) Proposed project involves ❒ water crossing, type _____ ❒ boat dock, ❒ boat ramp, ❒ water intake, ❒dredge, volume _____ cu. yds. ❒ filling, volume _____cu. yds. , type _____,

❒other (explain) _____

(5) Water body on which project will be located: _____

(6) Purpose: _____

(7) Project Description: _____

_____

_____

(8) Contractor, if known: _____

(9) Anticipated construction start date: _____ Completion date: _____

The filing of this application and its approval in no way relieves the applicant or riparian landowner from any responsibility or liability resulting from the construction, operation or failure of the project.

Riparian Land Owner or Organization Sponsor: (Print) _____

Applicant: (Print)_____

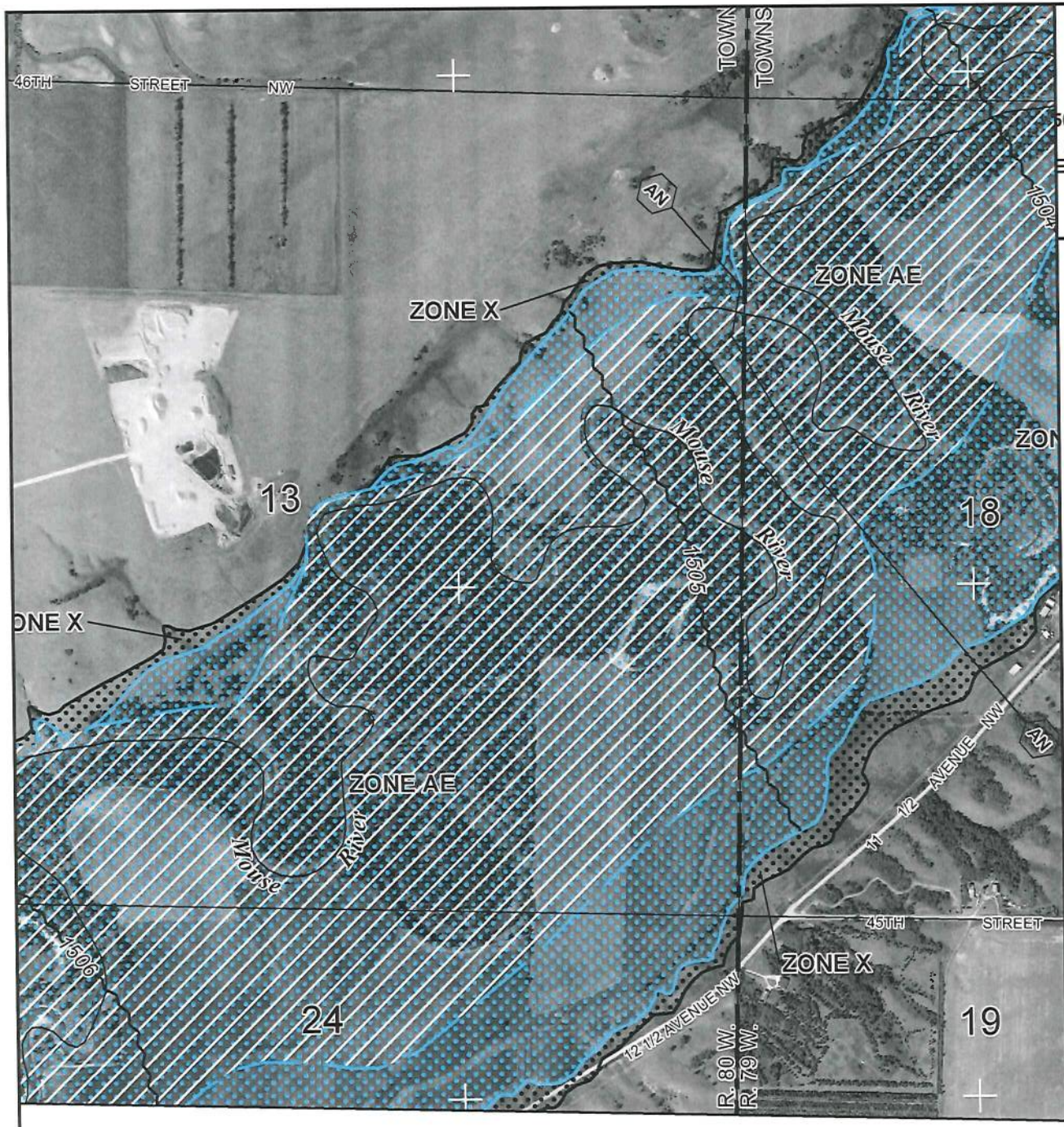
Address: _____

_____

Phone: (H) _____

(W) _____

Signature:_____ Date Submitted: _____
(Riparian landowner or Organization Sponsoring the project)



JOINS PANEL 0945

MAP SCALE 1" = 1000'

500 0 1000 2000

FEET

METERS

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0935F

FIRM

FLOOD INSURANCE RATE MAP

MCHENRY COUNTY, NORTH DAKOTA (AND INCORPORATED AREAS)

PANEL 935 OF 1450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEBANON, TOWNSHIP OF	380309	0935	F
MCHENRY COUNTY	380307	0935	F
VELVA, TOWNSHIP OF	380310	0935	F

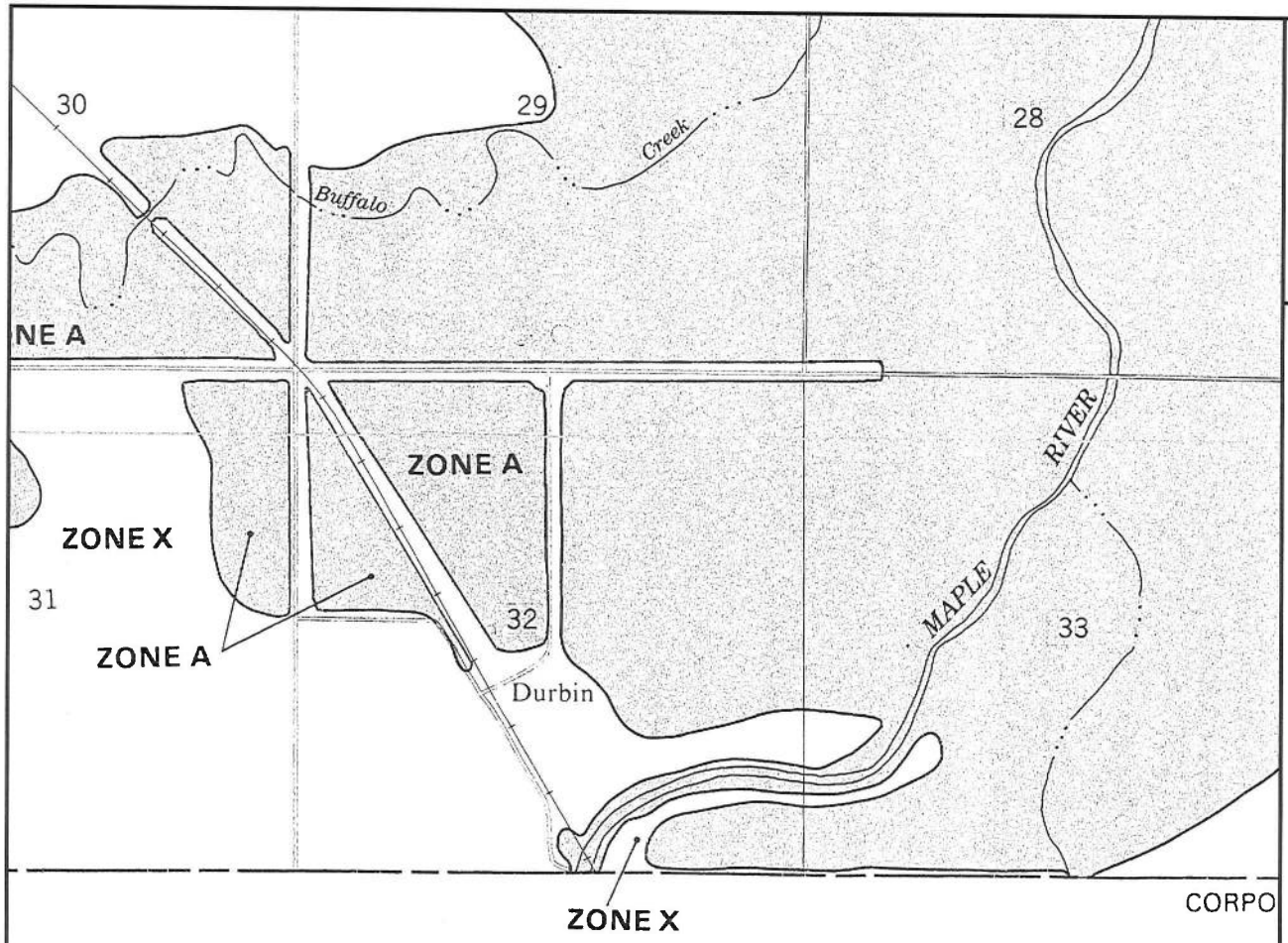
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
38049C0935F

MAP REVISED
JULY 18, 2011

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



N

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

TOWNSHIP OF
DURBIN,
NORTH DAKOTA
CASS COUNTY

ONLY PANEL PRINTED

(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
3803250025 B

MAP REVISED:
JANUARY 4, 2002

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

From: LeMoine, Sarah
Sent: Wednesday, March 01, 2017 2:35 PM
To: dcarpenter@nd.gov
Cc: Knapp, Leslie <Leslie.Knapp@tetratech.com>; thomas.hillstrom@xcelenergy.com; Jeffrey.Marquardt@xcelenergy.com; Sean.W.Lawler@xcelenergy.com; Noel.G.Klinnert@xcelenergy.com
Subject: Xcel Minot - Mouse River Flood Conveyance

Darlene,

Per our phone conversation today, please find the Mouse River flood conveyance calculations summary and enclosures attached. As discussed, please sign the Application for the State Engineer's Floodway Review form. I understand from our conversation that because the project is within the floodway, you are the one that must submit this to Dionne Haynes at the Office of the State Engineer and once she has approved the project then you will also need to approve the project.

I appreciate your time and assistance on this project and please let me know if you have any questions.

Thank you!

Sarah A. LeMoine, PE | Project Environmental Engineer
Cell **+1 (920) 915-3142** | Main **+1 (612) 643-2200** | sarah.lemoine@tetratech.com

Tetra Tech | Complex World, Clear Solutions™ | Environmental Services Divisions
2415 N Drew Street | Appleton, WI 54911 | tetratech.com

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Please consider the environment before printing. Read more



North McHenry County Soil Conservation District

August 11, 2016

Soil Conservation District Manager
North McHenry County Soil Conservation District
705 Main Street South
Towner, ND 58788-4042

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

To whom it may concern:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

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The purpose of this letter is to introduce the Project and to get input regarding any potential concerns or issues that may exist within the Project area listed above that would influence a decision regarding the use of the land, as well as applicable permits that may be required from the North McHenry County Soil Conservation District (SCD).

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

Ward County Soil Conservation District

August 11, 2016

Ms. Beth Brandt
Soil Conservation District Manager
Ward County Soil Conservation District
1920 13th Street SE
Minot, ND 58503

Subject: **Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota**

Dear Ms. Brandt:

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

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This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

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Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Enclosure:

Figure 1 - Project Location

cc:
Noel Klinnert – Xcel Energy
Mark Rothfork – Tetra Tech
Leslie Knapp – Tetra Tech

Souris River Joint Board

Rothfork, Mark

From: Rothfork, Mark
Sent: Friday, December 30, 2016 10:08 AM
To: 'David Ashley'
Cc: Hillstrom, Thomas G (Thomas.Hillstrom@xcelenergy.com)
Subject: RE: FW: Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota

David,

Thank you for your response.

The current construction schedule for the Xcel Energy Minot Project is September 2018 through December 2018. Property damages are handled on a case by case basis. If you have further questions please feel free to contact Tom Hillstrom, Xcel Energy Principle Permitting Agent, at 612-330-5835 (work) or 612-584-8783 (mobile). Thank you.

~Mark

Mark Rothfork, PMP | Environmental Planner/Project Manager
Cell **+1 (763) 257-6821** | Direct **+1 (612) 643-2223** | Main **+1 (612) 643-2200** | mark.rothfork@tetratech.com

From: David Ashley [mailto:dwashley56@gmail.com]
Sent: Thursday, December 29, 2016 11:06 PM
To: Rothfork, Mark <Mark.Rothfork@tetratech.com>
Subject: Re: FW: Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota

Mark,

I received your email. The question I have is there a schedule for property damages during the construction period and the demolition of the old line?

David Ashley

On Tue, Dec 27, 2016 at 11:24 AM, Rothfork, Mark <Mark.Rothfork@tetratech.com> wrote:

> Mr. Ashley,
>
> I am following up on my previous email (provided below) regarding the Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota. Can you please verify receipt of this email and let me know if you have any comments or concerns regarding the above referenced Project? Thank you.
>
> ~Mark

Mark Rothfork, PMP | Environmental Planner/Project Manager
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From: Rothfork, Mark
Sent: Thursday, August 18, 2016 1:09 PM
To: 'dwashley56@gmail.com' <dwashley56@gmail.com>
Cc: Knapp, Leslie <Leslie.Knapp@tetratech.com>
Subject: Xcel Energy Proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project in Ward and McHenry Counties, North Dakota

Dear Mr. Ashley:

I am sending this email on behalf of Tom Hillstrom, Xcel Energy Principal Permitting Agent.

Xcel Energy (Xcel) is currently preparing an application for a Certificate of Corridor Compatibility and Transmission Facility Route Permit for the proposed Magic City Substation to McHenry Substation 230/115 Kilovolt (kV) Transmission Line Project (proposed Project), in accordance with North Dakota Century Code (NDCC) Section 49-22-07.

The proposed Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line between the new substation (Magic City substation) in Ward County to an existing McHenry Substation, in McHenry County. Xcel's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed the existing 115 kV line will then be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. The township, section, and range of the proposed Project is provided in the table below and shown on the attached figure.

County	Township	Range	Sections
Ward	154 N	81 W	5, 6, 8, 9, 15, 16, and 22-25
	154 N	82 W	1 and 2
McHenry	152 N	80 W	2 and 3
	153 N	80 W	3, 4, 10, 11, 13, 14, 24, 25, and 36
	154 N	80 W	30-32

The existing 115 kV transmission line was constructed on wooden H-frame structures in the 1960s and is reaching the end of its service life. In addition, demand for electricity has increased in the area. As a result an additional 230 kV transmission line is required. The anticipated schedule for the Project is to begin in September 2018 with construction ending in December 2018.

The purpose of this email is to introduce the proposed Project and to get input regarding any potential concerns or issues that may exist within the proposed Project area listed above that would influence a decision regarding the use of the land, as well as the location of any flood control projects being proposed by the Souris River Joint Board.

This information will be used to help guide Project development in a manner that identifies and avoids impacts to sensitive resources where practicable. We have sent similar query letters to other agencies including, but not limited to, the U.S. Army Corps of Engineers (USACE) and U.S. Fish and Wildlife Department (USFWS).

If you have any questions regarding the information presented in this letter, please contact Tom Hillstrom at Xcel Energy, 612-330-5835 or at Thomas.Hillstrom@xcelenergy.com, or Leslie Knapp at 612-643-2240 or Leslie.Knapp@tetratech.com. Thank you for your assistance regarding the Project.

Respectfully submitted,

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
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Appendix D Wetland Reports

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Desktop Wetland Review - Transmission Line Corridor

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Minneapolis, MN 55402
www.aecom.com

612.376.2000 tel
612.376.2271 fax

Memorandum

To	Tom Hillstrom, Xcel Energy	Page	1
CC	Leslie Knapp, Tetra Tech		
Subject	Desktop Wetland Review Xcel Energy, Minot Load Serving Project McHenry and Ward Counties, North Dakota		
From	John Cannon, AECOM Mark Rothfok, Tetra Tech		
Date	February 10, 2017		

Introduction and Purpose

Xcel Energy is proposing to construct the Minot Load Serving Project (Project). The Project would consist of constructing a new substation and an approximately 20-mile-long 230 kV transmission line between the new substation (Magic City Substation) in Ward County and the existing McHenry Substation, in McHenry County. Xcel Energy's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission line has been constructed, the existing 115 kV line would be moved onto the new structures (230/115 kV double circuit structures) and the existing 115 kV line would be removed.

The Project survey corridor (Project Corridor) consists of an area approximately 300 feet wide (150 feet on either side of the centerline). The Project Corridor primarily crosses agricultural land. The Project location is shown in **Figure 1 and Appendix A**.

This memorandum summarizes the desktop wetland review completed by AECOM and Tetra Tech for the Project Corridor.

Coordination with U.S. Army Corps of Engineers

Prior to conducting the desktop review discussions were held with Ms. Toni Erhardt, U.S. Army Corps of Engineers (USACE) North Dakota Regulatory office, to obtain input on the desktop wetland review methods to be used for the Project. These discussions included a review of proposed desktop review methods, which would include using climate data, topography, soil data, and current and historical aerial photography. Toni concurred that a desktop wetland review was appropriate for this type of project and the desktop methods proposed. Toni also stated that the USACE would want to have both permanent and temporary impacts identified.

Toni stressed that our focus should be on permanent impacts and the permit thresholds associated with those impacts. If the Project permanently impacts less than $^{1}/_{10}$ acre of a jurisdictional wetland, no pre-construction notification (PCN) or mitigation would be required. If permanent impacts to jurisdictional wetlands are less than ½ acre, the Project would qualify for a Nationwide Permit (NWP).

Permanent impacts of more than ½ acre would require an Individual Permit (IP). Toni stated that the USACE does not typically require mitigation for temporary impacts as long as the impacts are relatively short-term. In addition, where temporary impacts are anticipated, Toni agreed that wetland boundaries could be conservatively estimated. Toni also requested that wetland areas in the Project Corridor that would not be impacted by the Project not be included in a permit application or PCN.

A PCN is required for a Project if:

- A Section 10 permit is required
- Mechanized land clearing in forested wetlands is required for the right-of-way (ROW)
- Discharge results in the loss of greater than $^{1}/_{10}$ acre of jurisdictional wetland
- Utility line exceeds 500 linear feet in Waters of the U.S. (WOUS)
- Utility line runs parallel to a stream bed within a jurisdictional area

Coordination with U.S. Fish and Wildlife Service

The Project Corridor crosses several U.S. Fish and Wildlife Service (USFWS) Wetland Easement areas (**Appendix A**). Jon Beyer, USFWS Wetland District Manager Audubon National Wildlife Refuge, and John Takala, USFWS Wetland District Manager/Federal Wildlife Officer J. Clark Salyer Wetland Management District (WMD) were contacted regarding determining the boundaries of the wetlands that are located within these easements. The USFWS directed the AECOM and Tetra Tech to use 2014 aerial photography as the basis for digitizing conservative wetland boundaries within the easement areas (**Appendix A, Sheet Maps 3, 4, 5, 8, 9, 20, 21, 22, and 23**). According to the USFWS, 2014 was a wet year and using the aerial photography flown that year would result in more extensive wetland boundaries. The digitized 2014 wetland boundaries and structure location geographic information system (GIS) shapefiles were provided to both Jon Beyer and John Takala to review. Xcel Energy's transmission line engineers worked with the USFWS to revise structure locations to avoid impacting USFWS wetland easement wetlands.

Emails dated October 4, 2016 from Jon Beyer and John Takala, confirmed that based on the 2014 aerial photography digitized wetland boundaries and the revised structure (pole) locations provided by Xcel Energy, no USFWS wetland easement wetlands would be impacted by the Project (**Appendix B**).

Desktop Wetland Review Data Sources

Project Corridor desktop wetland review data sources included topographic data, soil data, climate data, National Wetland Inventory (NWI) mapping, and current and historical aerial photography.

General Setting

The Project Corridor passes through the following hydrologic unit code (HUC)-8 watersheds: Moose Mountain Creek-Souris River, Deep River, and the Lower Souris River. These watersheds are located in the Northern Glaciated Plains ecoregion. This ecoregion is primarily a north to south trending ecoregion across eastern North and South Dakota. It widens to the west in north-central North Dakota and to the east into west-central Minnesota and covers approximately 54,572 square miles. The Northern Glaciated Plains ecoregion is characterized by a flat to gently rolling landscape composed of glacial till. The sub-humid conditions foster a transitional grassland containing tallgrass and shortgrass prairie. High concentrations of temporary and seasonal wetlands create favorable

conditions for waterfowl nesting and migration. Though the till soils are very fertile, agricultural success is subject to annual climatic fluctuations. Average annual precipitation varies from 22 to 26 inches. Although more than half of the annual precipitation occurs during the growing season, it usually limits maximum crop production. (Omernik, 2010).

Data Sources

Available background information from government agency documents and private sources, where available, were collected and reviewed as a part of the desktop review. The documents reviewed included:

- United States Geologic Service (USGS) 7.5-Minute Topographic Quadrangle Maps for Surrey, Sawyer NE, and Velva, North Dakota (USGS, 2016).
- Web Soil Survey of McHenry and Ward Counties, North Dakota, http://websoilsurvey.nrcs.usda.gov (U.S. Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS), accessed website on March 30, 2016).
- Hydric Soils List for McHenry and Ward Counties, North Dakota (USDA/NRCS, accessed website on March 30, 2016).
- Aerial Imagery for McHenry and Ward Counties, North Dakota (2003, 2006, 2009, 2010, 2012, 2014, 2015, 2015 LiDAR (Xcel provided imagery), and 2016).
- NWI GIS data, USFWS, website accessed on May 29, 2015.

The USGS topographic map indicates that the Project Corridor is located in a relatively flat area southeast of Minot (**Figure 2)**. NWI mapping for McHenry and Ward Counties was reviewed for the Project Corridor and is shown on **Figure 3**.

The SSURGO Soil Survey of McHenry and Ward Counties indicate that there are 36 soil units mapped within the Project Corridor (**Table 1**). Twenty six of the mapped soil units are classified as hydric (1-32%), two of the mapped soil units are classified as hydric (33-65%), seven of the mapped soil units are classified as hydric (66-99%), and one mapped soil unit is classified as hydric (100%). This rating indicates the percentage of map units that meet the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit. The Soil Survey designations for the Project Corridor are shown in **Figure 4**.

Methodology

The identified data sources were reviewed to estimate a conservative wetland boundary that, when used to determine permanent and temporary wetland impacts resulting from the Project, would result in conservatively high (or worst-case) estimates. The 2010 aerial was used as the basis to digitize initial conservative wetland boundaries because it represented a wet year throughtout the entire growing season based on precipitation data in the NRCS Field Office Technical Guide for McHenry County, North Dakota (Station 8990). This conservative wetland boundaries were then overlain on aerials dated 2003, 2006, 2009, 2010, 2012, 2014, 2015, 2015 LiDAR (Xcel provided imagery), and 2016. The wetland boundaries were adjusted to reflect the most consistent and conservative wet signature over the 14 year timeframe.

Oftentimes the conservative boundaries identified fell within areas currently under agricultural production. The North Dakota NRCS typically uses 2003 and 2009 as normal precipitation years to determine the wetland boundaries. This desktop wetland analysis resulted in wetland boundaries that were typipcally more conservative (extensive) than what was shown on the 2003 and 2009 aerials. The wetland boundaries shown in **Appendix A** represent the most consistent and conservative wetland boundaries over the 14 year timeframe.

Table 1: Hydric Soil Types

Map Unit Symbol	Hydric Rating	Hydric Class	Map Unit Symbol	Hydric Rating	Hydric Class
F117A	11	1-32% Hydric Components	F376A	3	1-32% Hydric Components
F142A	4	1-32% Hydric Components	F564A	11	1-32% Hydric Components
F142B	4	1-32% Hydric Components	F732A	2	1-32% Hydric Components
F143A	6	1-32% Hydric Components	G128A	15	1-32% Hydric Components
F143B	6	1-32% Hydric Components	G143B	6	1-32% Hydric Components
F143C	6	1-32% Hydric Components	G143C	6	1-32% Hydric Components
F143D	6	1-32% Hydric Components	G658B	4	1-32% Hydric Components
F144B	8	1-32% Hydric Components	G662A	3	1-32% Hydric Components
F146B	21	1-32% Hydric Components	F100A	40	33-65% Hydric Components
F147D	2	1-32% Hydric Components	F566A	45	33-65% Hydric Components
F147F	3	1-32% Hydric Components	F2A	89	66-99% Hydric Components
F148D	2	1-32% Hydric Components	F3A	94	66-99% Hydric Components
F148F	3	1-32% Hydric Components	F4A	92	66-99% Hydric Components
F151A	30	1-32% Hydric Components	F523A	93	66-99% Hydric Components
F157A	2	1-32% Hydric Components	F527A	98	66-99% Hydric Components
F159A	24	1-32% Hydric Components	F55A	94	66-99% Hydric Components
F166B	9	1-32% Hydric Components	G836A	97	66-99% Hydric Components
F177F	3	1-32% Hydric Components	G32A	100	100% Hydric Components

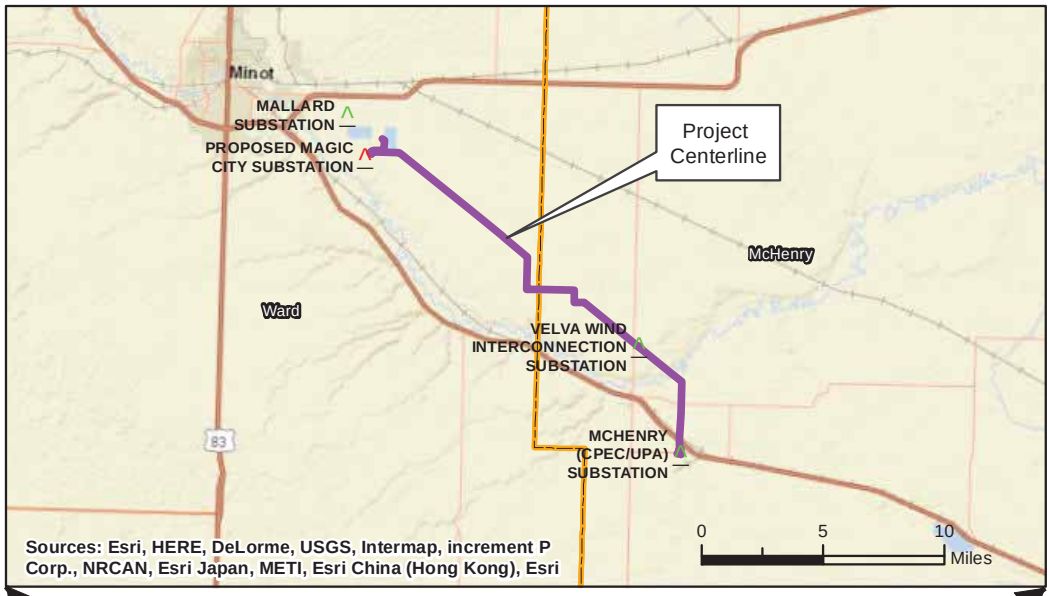
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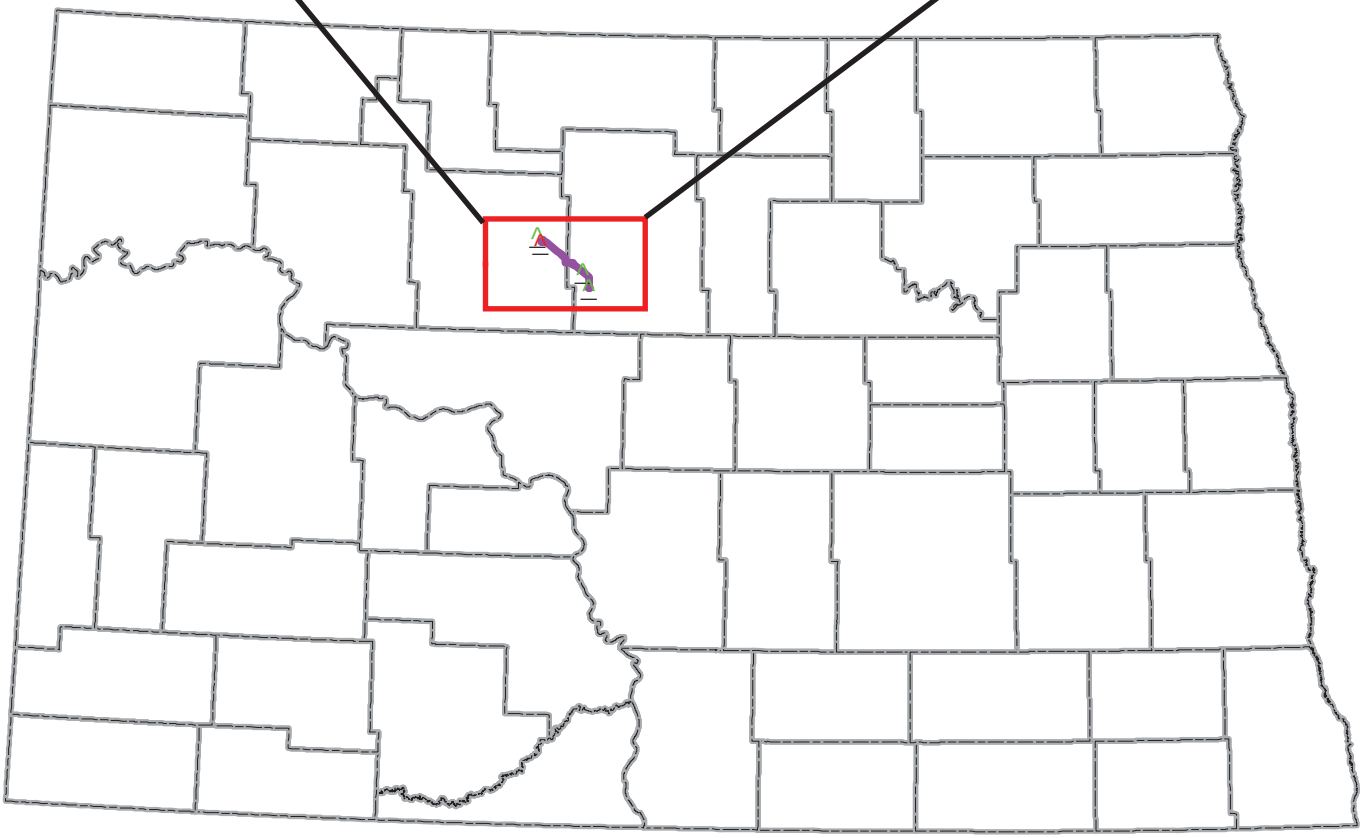
The desktop wetland review identified 148 wetland areas within the Project Corridor. The conservatively estimated boundary of these wetlands are shown in **Appendix A**. **Appendix C** includes a table of all 148 wetlands identifying the years that the wetland signature was visible, if the wetland was mapped as a NWI wetland, if the wetland is within a USFWS wetland easement area, if hydric soils are present, wetland size, and Cowardin wetland type.

Enclosures:

Figures 1- 4
Appendix A – Sheet Maps
Appendix B – Agency Coordination
Appendix C – Desktop Wetland Review Results

Figure 1 Project Location Map
Figure 2 Topographic Map
Figure 3 National Wetland Inventory Map
Figure 4 Hydric Soil Map





North Dakota

Legend

- Project Centerline
- Proposed Substation
- Substation

20 0 20 Miles

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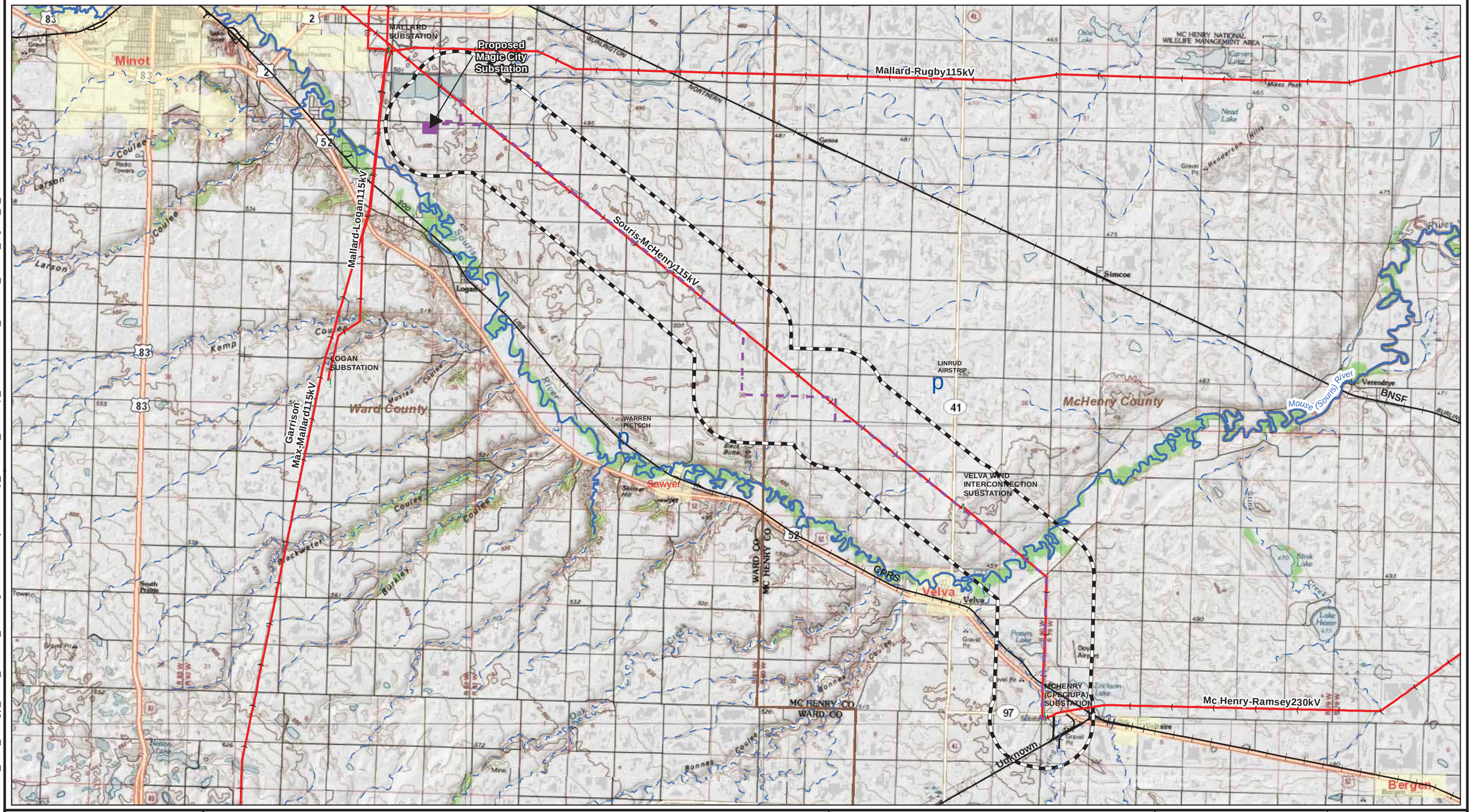
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Minot Load Serving Project

McHenry and Ward Counties, North Dakota

Figure 1
Project Location Map
February 2017

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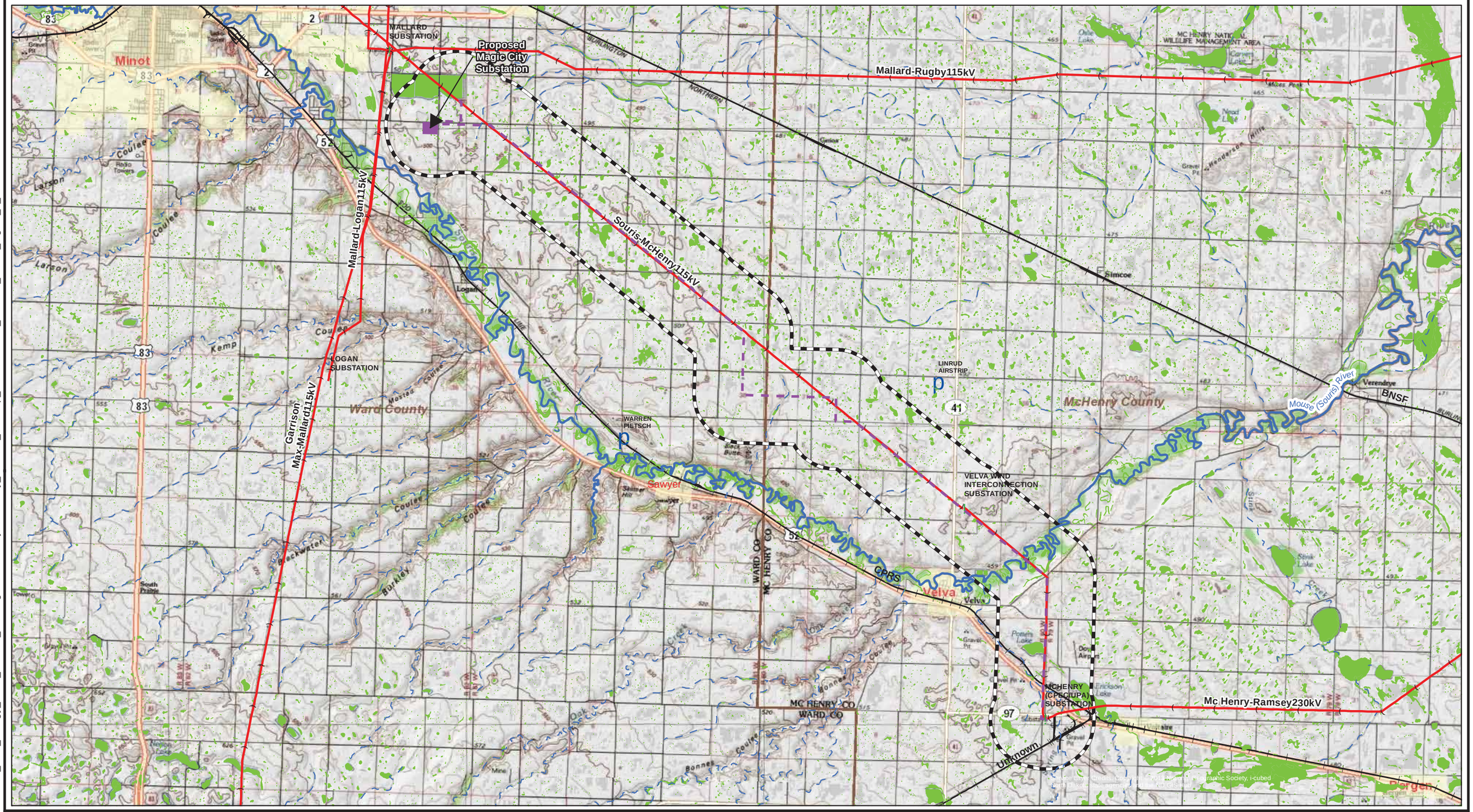
Minot Load Serving Project
Topography Map
McHenry and Ward Counties, North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	Figure 2

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Project Feature
- 1-Mile Study Area
- Proposed Alignment
- Proposed Magic City Substation

Existing Utility
- Transmission Line
- Substation

Water Feature
- Stream (Intermittent)
- Stream (Perennial)

NWI Wetland
- Wetland

Transportation
- Airport
- Railroad
- Business Loop
- Interstate
- State Highway
- U.S. Highway

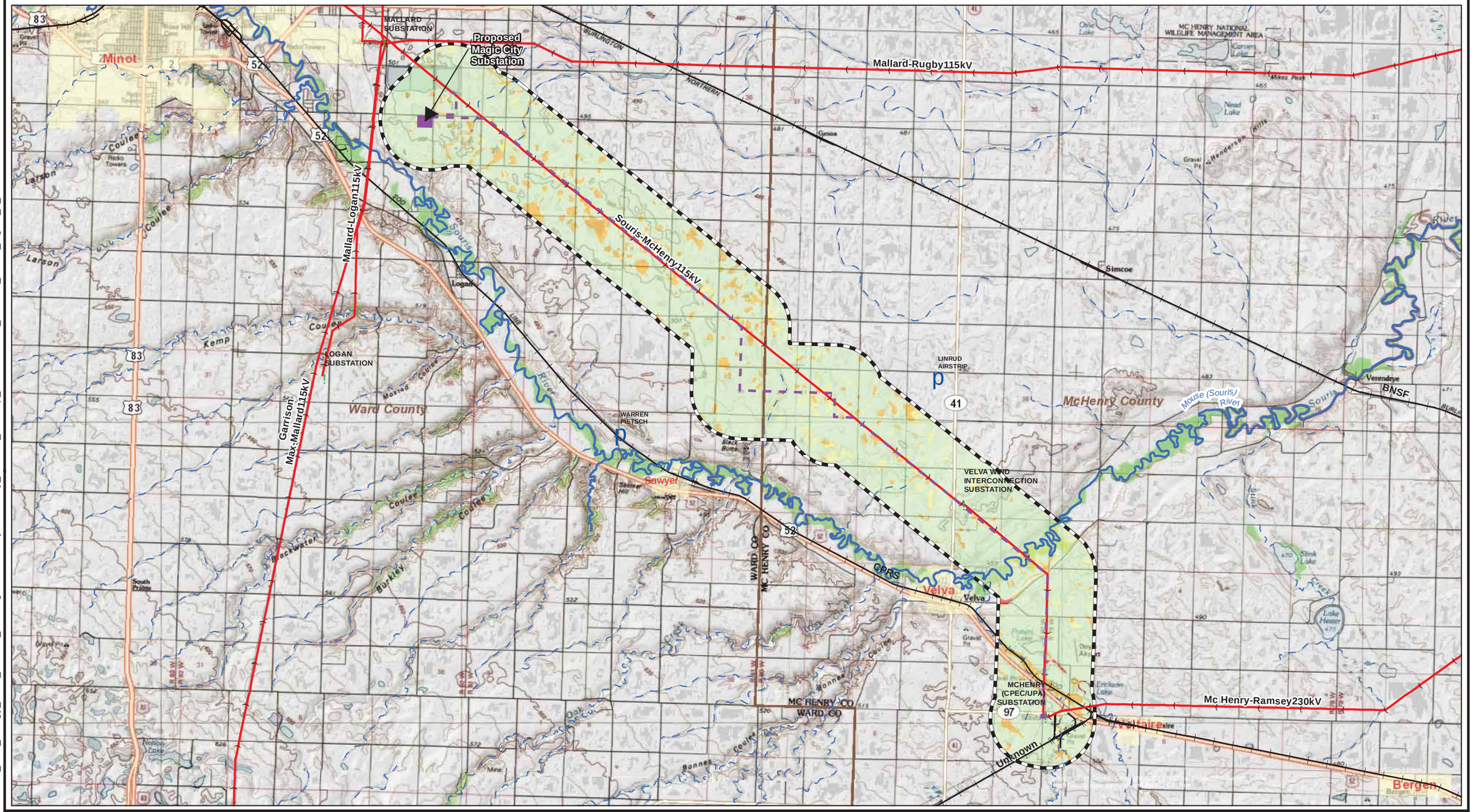
Miles
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Minot Load Serving Project National Wetland Inventory Map McHenry and Ward Counties, North Dakota

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Minot Load Serving Project SSURGO Hydric Soil Map McHenry and Ward Counties, North Dakota

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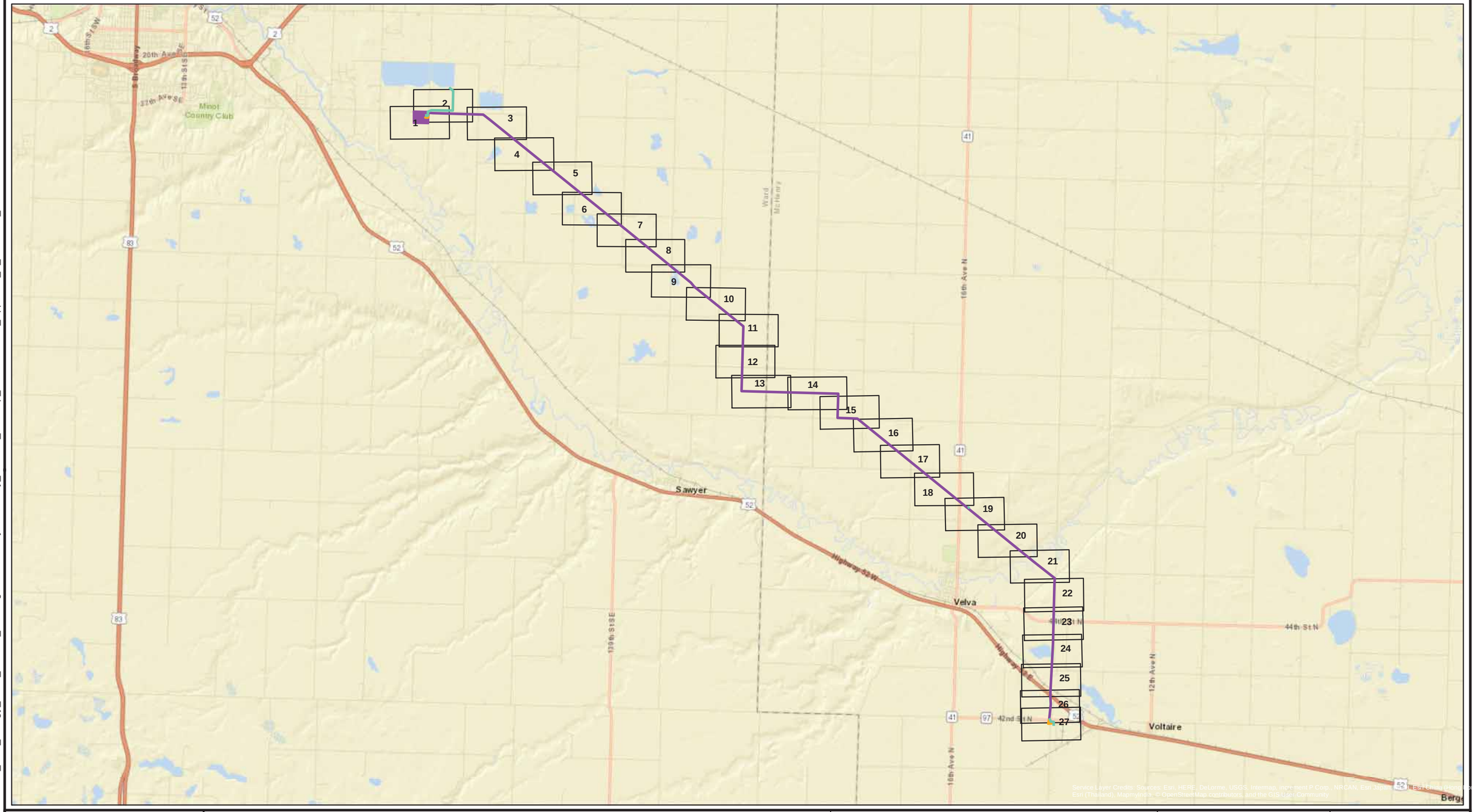
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PROJECT NUMBER	60342328
FIGURE NUMBER	Figure 4

Appendix A:
Desktop Wetland Review Sheet Map

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Project Feature

- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Proposed Magic City Substation

Sheet Map Index

- Sheet Map Index

Minot Load Serving Project Appendix A - Desktop Wetland Review Sheet Map Index McHenry and Ward Counties, North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	Appendix A

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T155N
R82W S35

37th Ave

T154N
R82W S2

0850-131
0850-132
0850-133
0850-134
0850-135
Wetland 5
37th Ave SE
0850-130
0924-187
0924-186
0924-185
0924-184
0924-188-DE
Wetland 6
0850 Sub
5572 Sub
5572 Sub
0850 Sub
0850-129
Wetland 4
0924-189-DE
Wetland 7
0924 Sub
0924 Sub
0924 Sub
0924-190-DE

86th St SE
86th St

T154N
R82W S1

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North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Proposed Magic City Substation
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
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PROJECT NUMBER		60342328
SHEET MAP		1

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T155N
R82W S35

86th St SE
86th St

Wetland 5
Wetland 8
Wetland 4
Wetland 6
Wetland 7
Wetland 9
Wetland 9
Wetland 10

37th Ave SE
37th Ave

0850-140
0850-140
0850-139
0850-138
0850-137
0850-131
0850-132
0850-133
0850-134
0850-135
0850-136
0850-130
0924-188-DE
0924-187
0924-186
0924-185
0924-184
0924-183
0924-182
0924-181
0924-180
0850 Sub
5572 Sub
0850-129
0850 Sub
5572 Sub
0924-189-DE
0924 Sub
0924 Sub
0924-190-DE
0924 Sub

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North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Proposed Magic City Substation
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

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PROJECT NUMBER	60342328
SHEET MAP	2

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Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

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PROJECT NUMBER		60342328
SHEET MAP		3

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0924-169
0924-168
0924-167
0924-166
0924-165
0924-164
0924-163
0924-162
0924-161
0924-160
0924-159

Wetland 17
Wetland 18
Wetland 19
Wetland 20
Wetland 21
Wetland 22
Wetland 23
Wetland 24

T154N R81W S6
T154N R81W S7
T154N R81W S8
T154N R81W S5

111th St
111th St SE
54th Ave
54th Ave SE

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	4	

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

Wetland 22

54th Ave

54th Ave SE

0924-161

0924-160

0924-159

0924-158

0924-157

0924-156

0924-155

0924-154

0924-153

0924-152

Wetland 23

Wetland 24

Wetland 25

Wetland 26

Wetland 27

Wetland 28

Wetland 29

Wetland 30

T154N
R81W S5

T154N
R81W S4

T154N
R81W S8

125th St SE

125th St

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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USDA NAIP Aerial Dated: June 2016



Project Feature
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Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access
- Secondary Access
- Landowner Permission Required

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		5

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Project Feature
- Preliminary Structure Location
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- Parcel Boundary

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access
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0 200 400 Feet

Minot Load Serving Project Appendix A - Desktop Wetland Review Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		6

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T154N R81W S9

T154N R81W S10

T154N R81W S15

T154N R81W S16

66th Ave

139th St

0924-146
0924-145
0924-144
0924-143
0924-142
0924-141
0924-140
0924-139
0924-138
0924-137

Wetland 30
Wetland 32
Wetland 33
Wetland 34

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USDA NAIP Aerial Dated: June 2016



Project Feature
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Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project Appendix A - Desktop Wetland Review Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		7

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T154N
R81W S14

Wetland 32
0924-138
0924-137
Wetland 33
0924-136
0924-135
Wetland 34
Wetland 35
0924-134
Wetland 37
Wetland 36
0924-133
0924-132
Wetland 38
159th St SE
79th Ave
79th Ave SE
0924-131
T154N
R81W S23
T154N
R81W S22
0924-130
Wetland 39
0924-129

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
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Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	8	

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T154N R81W S15

T154N R81W S14

T154N R81W S22

T154N R81W S23

79th Ave SE

153rd St SE

0924-131

0924-130

0924-129

0924-128

0924-127

0924-126

0924-125-DE

0924-124-DE

0924-123

0924-122

0924-121

Wetland 34

Wetland 37

Wetland 38

Wetland 39

Wetland 40

Wetland 41

Wetland 42

Wetland 43

Wetland 44

Wetland 45

Wetland 46

Wetland 47

Wetland 48

Wetland 49

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Project Feature
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Desktop Wetland Review
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Access Route
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- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

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Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		9

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T154N
R81W S23

T154N
R81W S24

T154N
R81W S26

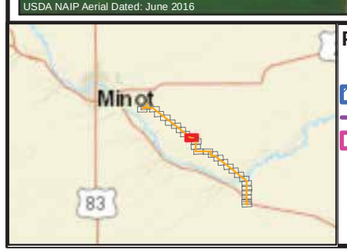
T154N
R81W S25

0924-123
0924-122
0924-121
0924-120
0924-119
0924-118
0924-117
0924-116
0924-115
0924-114
0924-113

Wetland 46
Wetland 47
Wetland 48
Wetland 49
Wetland 50
Wetland 51
Wetland 52
Wetland 52
Wetland 52
Wetland 52
Wetland 53

93rd Ave
93rd Ave SE
167th St SE
167th St

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
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Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		10

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T154N R81W S24

T154N R80W S19

T154N R80W S30

93rd Ave

50th St

201st Ave N

0924-114

0924-113

0924-112

0924-111-DE

0924-110

0924-109

0924-108

0924-107

Wetland 52

Wetland 52

Wetland 52

Wetland 53

Wetland 52

Wetland 123

Wetland 54

Wetland 55

Wetland 56

Wetland 58

Wetland 57

Wetland 121

Wetland 122

Wetland 57

Wetland 59

Wetland 57

Wetland 62

Wetland 62

Wetland 60

Wetland 61

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USDA NAIP Aerial Dated: June 2016



Project Feature

- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland
- USFWS Wetland Easement Wetland

Access Route

- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
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Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	11	

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T154N
R81W S26

T154N
R81W
S35

0924-107
0924-106
0924-105
0924-104
0924-103
0924-102
0924-101

Wetland 52
Wetland 122
Wetland 124
Wetland 125
Wetland 128
Wetland 129
Wetland 126
Wetland 130
Wetland 127
Wetland 57
Wetland 59
Wetland 60
Wetland 62
Wetland 61
Wetland 63
Wetland 64
Wetland 133
Wetland 131
Wetland 132
Wetland 134

167th St SE
107th Ave
107th Ave SE
49th St N
167th St
20th Ave N
20th Ave

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

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Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	12	

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Wetland 134
0924-100
0924-099
Wetland 135
Wetland 136
0924-098-DE
0924-097
0924-096
0924-095
0924-094
0924-093
0924-092
0924-091
0924-090
0924-089
Wetland 137
Wetland 140
20th Ave NE
20th Ave
Wetland 139
Wetland 138

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		13

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T154N
R80W S31

T154N
R80W S32

Wetland 72
Wetland 73
Wetland 74
Wetland 75
Wetland 76
Wetland 77
Wetland 78
Wetland 79
Wetland 80
Wetland 138
Wetland 139
Wetland 140
Wetland 141
Wetland 142
Wetland 143
Wetland 144
Wetland 145
Wetland 146
Wetland 147
Wetland 148
Wetland 149
Wetland 150
Wetland 151

19th Ave N

0924-088
0924-087
0924-086
0924-085
0924-084
0924-083
0924-082
0924-081
0924-080-DE
0924-079
0924-078
0924-077

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Landowner Permission Required

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
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Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		14

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

Wetland 77
Wetland 149
Wetland 147
Wetland 151
0924-079
Wetland 148
0924-078
Wetland 76
Wetland 79
Wetland 78
0924-077
18th Ave N
T154N
R80W S33
0924-076
Wetland 80
Wetland 81
18th Ave
0924-074
0924-073
0924-072-DE
0924-075-DE
48th St N
48th St
Wetland 82
T153N
R80W S4
T153N
R80W S5
0924-071

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

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Drawn:	MAR	2/20/2017
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Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	15	

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T154N R80W S32

T154N R80W S33

48th St N

48th St

0924-071

0924-070

0924-069

0924-068

0924-067

0924-066

Wetland 83

Wetland 84

Wetland 85

18th Ave N

18th Ave

17th Ave

T153N R80W S5

T153N R80W S4

T153N R80W S3

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
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Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
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Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		16

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0924-067
0924-066
0924-065
0924-064
0924-063
0924-062
0924-061
0924-060

Wetland 84
Wetland 85
Wetland 86
Wetland 87
Wetland 88
Wetland 89
Wetland 90

T153N
R80W S4

T153N
R80W S9

47th St
47th St N
17th Ave N
17th Ave

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USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

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Drawn:	MAR	2/20/2017
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Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		17

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Wetland 88

Wetland 90

0924-060

0924-059

0924-058

0924-057

0924-056

0924-055

0924-054

Wetland 91

0924-053

0924-052

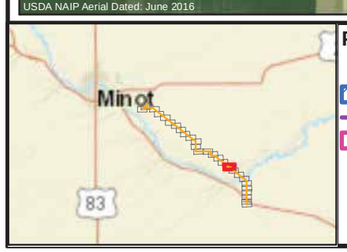
0924-051

41

T153N
R80W S11

T153N
R80W S10

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USDA NAIP Aerial Dated: June 2016



Project Feature

- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland

Access Route

- Primary Access
- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

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Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
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PROJECT NUMBER		60342328
SHEET MAP		18

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Project Feature

- Preliminary Structure Location
- Potential Staging Area
- Preliminary 115 kV Centerline
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership

- Parcel Boundary

Desktop Wetland Review

- Wetland

Access Route

- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
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PROJECT NUMBER	60342328	
SHEET MAP	19	

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Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Perennial)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 2/20/2017
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PROJECT NUMBER	60342328
SHEET MAP	20

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Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Perennial)

Desktop Wetland Review
- Wetland

Access Route
- Primary Access
- Secondary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		21





Project Feature

- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership

- Parcel Boundary

Access Route

- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		22

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

0924-024
0924-023
0924-022
0924-021
0924-020
0924-019
0924-018

T153N
R80W S24

T153N
R80W S25

T153N
R79W S19

T153N
R79W S30

44th St S

44th St N

14th Ave N

13th Way N

13th Way

Wetland 114

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Desktop Wetland Review
- Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 2/20/2017
Approved:	LHK 2/20/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	23

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

0924-018
0924-017
0924-016
0924-015
0924-014
0924-013
0924-012
Wetland 114
Wetland 114
Wetland 114
Wetland 115
14th Ave N
13th Way N
13th Way
T153N R79W S30
T153N R80W S25
Spring Creek
Canadian Pacific Railway

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), Mapmyindia, © OpenStreetMap contributors, and the GIS User Community
North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
- Preliminary Structure Location
- Potential Staging Area
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		24

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_WetlandMinot_Appendix_A_20170220.mxd

T153N R80W S25

T153N R80W S36

T153N R79W S30

T153N R79W S31

0924-012

0924-011

0924-010

0924-009

0924-008

0924-007

0924-006

Wetland 115

Wetland 114

Wetland 116

Wetland 119

Wetland 118

Wetland 117

43rd St

43rd St N

13th Way N

14th Ave N

13th Ln N

13th Ln

52

Canadian Pacific Railway

Spring Creek

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature
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- Potential Staging Area
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- Project Corridor

Property Ownership
- Parcel Boundary

Stream/River
- Stream (Intermittent)

Desktop Wetland Review
- Wetland
- USFWS Wetland Easement Wetland

Access Route
- Primary Access

0 200 400 Feet

Minot Load Serving Project Appendix A - Desktop Wetland Review Map McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:		1:4,800
PROJECT NUMBER		60342328
SHEET MAP		25

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

T153N
R80W S36

Wetland 117

Wetland 119

Wetland 117

Wetland 118

0924-006

Spring Creek

0924-005

Canadian Pacific Railway

13th Ln N

0924-004

14th Ave

T153N
R79W S31

52

14th Ave N

13th Ln

0924-003

Wetland 120

0924-002

0924-002

T152N
R80W S3

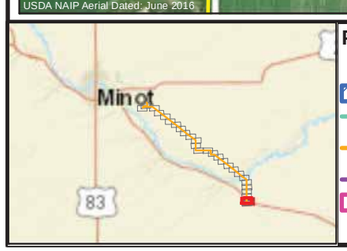
T152N
R80W S2

5572-004

mchenry 115kv

5572-004

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature

- Preliminary Structure Location
- Potential Staging Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership

- Parcel Boundary

Stream/River

- Stream (Intermittent)

Desktop Wetland Review

- Wetland

Access Route

- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR 2/20/2017
Approved:	LHK 2/20/2017
Scale:	1:4,800
PROJECT NUMBER	60342328
SHEET MAP	26

P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Survey_Corridor_Desktop_Wetland\Minot_Appendix_A_20170220.mxd

T153N R80W S36

T153N R79W S31

T152N R80W S3

T152N R80W S2

0924-003

0924-002

0924-002

Wetland 120

5572-004

5572-004

mchenry 115kv

McHenry 230kv

0924-001

14th Ave N

14th Ave N

14th Ave

13th Ln

13th Ln N

52

Spring Creek

Service Layer Credits: Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
North Dakota state agencies and the ND GIS Hub
USDA NAIP Aerial Dated: June 2016



Project Feature

- Preliminary Structure Location
- Potential Staging Area
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Project Corridor

Property Ownership

- Parcel Boundary

Stream/River

- Stream (Intermittent)

Desktop Wetland Review

- Wetland

Access Route

- Primary Access

0 200 400 Feet

Minot Load Serving Project
Appendix A - Desktop Wetland Review Map
McHenry and Ward Counties, North Dakota

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE®

Prepared By: TETRA TECH

Drawn:	MAR	2/20/2017
Approved:	LHK	2/20/2017
Scale:	1:4,800	
PROJECT NUMBER	60342328	
SHEET MAP	27	

Appendix B:
Agency Coordination

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Rothfork, Mark

From:	Beyer, Jonathan <jonathan_beyer@fws.gov>
Sent:	Tuesday, October 04, 2016 9:16 AM
To:	Hillstrom, Thomas G
Cc:	John_Takala@fws.gov; Rothfork, Mark; Marquardt, Jeffrey D; Klinnert, Noel G; Lawler, Sean W
Subject:	Re: FW: Xcel Powerline SE of Minot
Attachments:	20161003161454.pdf

Tom-

Thank you for making the adjustments to your original proposal to avoid easement wetlands in the portion of the Excel Energy Project that I am responsible for reviewing (i.e. Ward County).

From discussions we have had and your email, I understand you are concerned that the landowner may provide some "push back" on the placement of the power poles. I also understand it is Excel Energy's intent to avoid all wetland impacts related to this project. From discussions we have had, it is also my understanding that Excel is proposing to place the power poles as close to the wetland edge as possible without causing impacts to occur to easement protected wetlands.

I have reviewed your most recent proposal (i.e. 2nd proposal) of pole placements within Ward County and have determined that the proposal will avoid USFWS wetland easement interests while also providing a small buffer for your construction team to complete this project. Because you have requested to place the poles as close to the wetland as possible, I have placed two yellow dots on the attached map where poles could be constructed and still avoid USFWS easement interests (see attached map). Placing the poles at the locations of the yellow dots would significantly limit the amount of construction space your team would have to work with during placement of the poles. Your original/1st proposal (green dots on the attached map) will impact USFWS wetland easement interests.

Concerning tillage and USFWS wetland easements, farming of wetlands including digging, plowing, etc. is allowed by the provisions of the wetland easement contract. The wetland easement contract also allows for water levels in the wetlands to expand and contract as they have during the past several years.

Poles 108 and 109 within the Alvin Finneseth property are outside of easement protected wetland basins, and therefore I have no objection with your pole placement on the Finneseth property as proposed.

Please let me know if you have additional questions or concerns regarding this project. Thank you for your efforts to avoid easement impacts. Please send me your final proposal so I can document your decision in my file.

Jon Beyer
Wetland District Manager
Audubon National Wildlife Refuge
3275 11th St NW
Coleharbor, ND 58531
Office Phone: 701-442-5474 ext 116

On Mon, Oct 3, 2016 at 1:41 PM, Hillstrom, Thomas G <Thomas.Hillstrom@xcelenergy.com> wrote:

Hi John,

As we discussed, we are providing some additional information. Attached is a zip file containing mapping of structure locations and a wetland boundary based on the 2014 (wet) aerial photo.

John Takala,

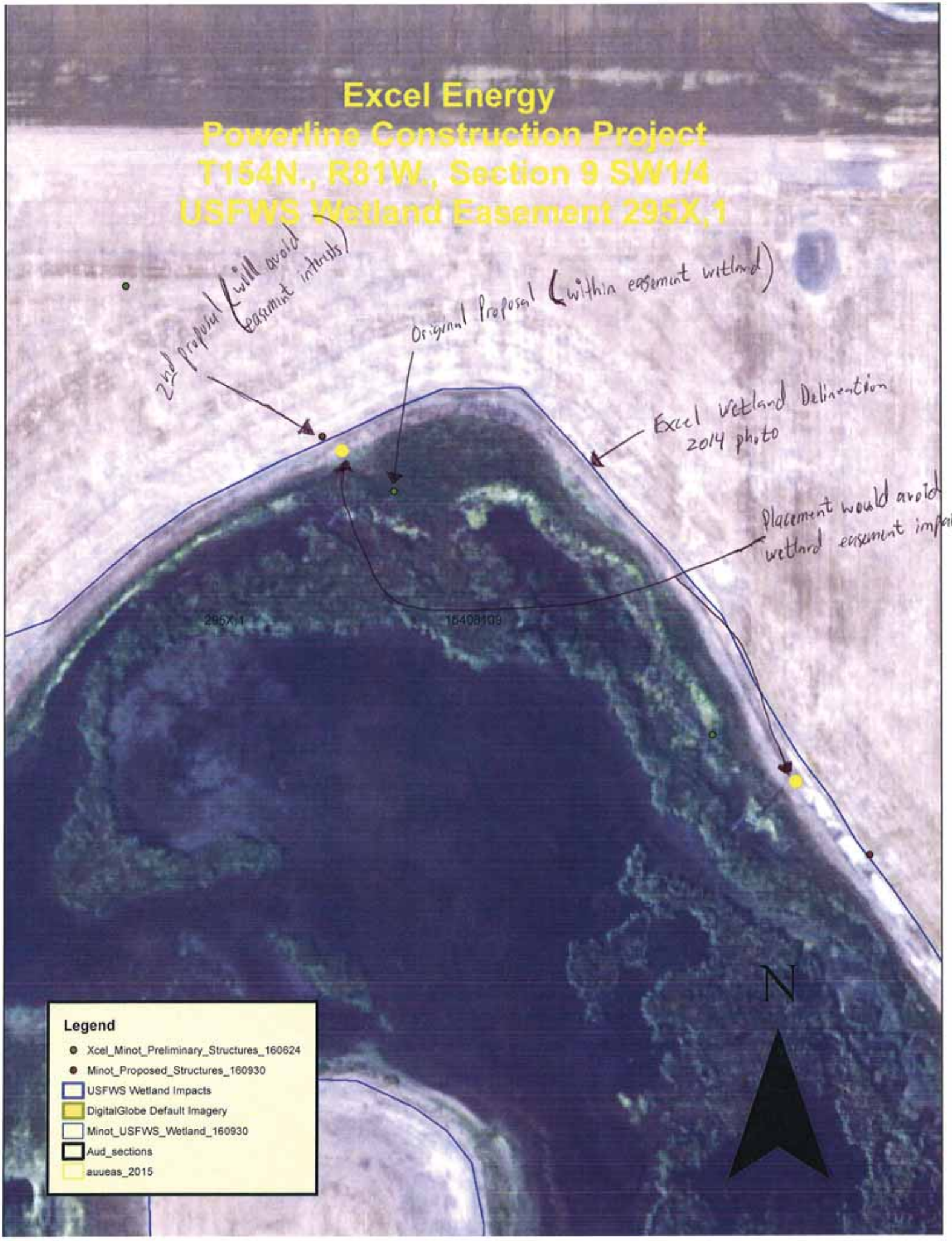
At structure 146-147 (Martha Klein property), we mapped wetlands using the wet 2014 year and find that avoiding this boundary puts the poles
Approximately 40 to 50 feet in the current tilled area. We expect some pushback from the landowner for this placement. Please take a look at the attached pdf file showing detail pole locations here. The new line would be built on the north side of the old line at this location and the old line would be removed. We'd like to get an approved and final pole location worked out with you and the landowner so these pole locations can be locked in.
Can you also confirm that poles 108 and 109 are outside of wetlands on the Alvin Finneseth property?

John Beyer,

Poles 9 and 10 on the Krumwiede property are more of a challenge to avoid the mapped wetland. You mentioned that you may have some wetland boundary revisions here. One option may be to move structure 10 to higher ground. Can you provide a new boundary for the wetland near Structure 10? Maybe the best way to work this out would be a conference call with our engineer. I plan on being in the area soon (possibly next week) , maybe we could meet at the site.

Thanks you both for helping us through this.

Tom Hillstrom
Xcel Energy | Responsible By Nature
Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com


Excel Energy
Powerline Construction Project
T154N., R81W., Section 9 SW1/4
USFWS Wetland Easement 295X,1
2nd proposal (will avoid easement intrests)
Original Proposal (within easement wetland)
Excel Wetland Delineation 2014 photo
Placement would avoid wetland easement impacts
295X1
16408109
N
Legend
Xcel_Minot_Preliminary_Structures_160624
Minot_Proposed_Structures_160930
USFWS Wetland Impacts
DigitalGlobe Default Imagery
Minot_USFWS_Wetland_160930
Aud_sections
auueas_2015

Rothfork, Mark

From: Takala, John <john_takala@fws.gov>
Sent: Tuesday, October 04, 2016 11:49 AM
To: Hillstrom, Thomas G
Cc: Beyer, Jonathan; Rothfork, Mark; Marquardt, Jeffrey D; Klinnert, Noel G; Lawler, Sean W
Subject: Re: FW: Xcel Powerline SE of Minot

Tom,

Poles 9 and 10 on the Krumwiede property are located in what I would classify as wet meadow, which is not typically a wetland type that would be protected by a USFWS wetland easement. There is an easement protected basin approximately 40 feet west of pole 10. If the location of pole 10 does not change the project will not impact USFWS easement protected wetlands. Please contact me f you have any other questions.

Thanks,
John

John Takala
Wetland District Manager/Federal Wildlife Officer

J Clark Salyer WMD
681 Salyer Road
Upham, ND 58789
701 768-2548 ext 114 Office
701 768-2834 Fax
701 500-1388 Cell

On Mon, Oct 3, 2016 at 1:41 PM, Hillstrom, Thomas G <Thomas.Hillstrom@xcelenergy.com> wrote:

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Principal Permitting Agent
414 Nicollet Mall, 414-6A Minneapolis, MN 55401
P: 612 330 5835 **C:** 612 584 8783
E: thomas.hillstrom@xcelenergy.com

Appendix C:
Desktop Wetland Review Results

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Name	2003	2006	2009	2010	2012	2014	2015	2016	2015 LiDAR	NWI Wetland	USFWS Easement Wetland	Hydric Soil	Cowardin Type	Stream Name	Acres
Wetland 4	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	5.98
Wetland 5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	8.72
Wetland 6	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	3.78
Wetland 7	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	4.76
Wetland 8	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	1.86
Wetland 9	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMC	NOT APPLICABLE	1.47
Wetland 10	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	RIVERINE	UNNAMED	0.16
Wetland 11	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMC	NOT APPLICABLE	1.61
Wetland 12	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMC	NOT APPLICABLE	0.16
Wetland 13	Y	Y	Y	N	Y	Y	N	Y	Y	N	N	Y	PEMC	NOT APPLICABLE	0.17
Wetland 14	N	Y	N	Y	Y	Y	Y	N	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.28
Wetland 15	N	Y	N	N	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	0.65
Wetland 16	Y	N	N	Y	Y	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.54
Wetland 17	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	8.49
Wetland 18	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	19.16
Wetland 19	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	2.50
Wetland 20	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	22.14
Wetland 21	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.48
Wetland 22	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	5.69
Wetland 23	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	6.95
Wetland 24	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	14.70
Wetland 25	N	N	Y	N	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.08
Wetland 26	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMA	NOT APPLICABLE	2.46
Wetland 27	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMBF	NOT APPLICABLE	20.95
Wetland 28	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMC	NOT APPLICABLE	42.41
Wetland 29	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMBF	NOT APPLICABLE	29.74
Wetland 30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	348.94
Wetland 30	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMBF	NOT APPLICABLE	73.59
Wetland 31	N	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	PEMA	NOT APPLICABLE	1.23
Wetland 32	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	29.77
Wetland 33	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	2.95
Wetland 34	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	83.11
Wetland 35	N	N	N	Y	N	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.12
Wetland 36	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	4.81
Wetland 37	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMF	NOT APPLICABLE	8.43
Wetland 38	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	6.75
Wetland 39	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	39.91
Wetland 40	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.39
Wetland 41	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	2.88
Wetland 42	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	6.32
Wetland 43	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	6.43
Wetland 44	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.27
Wetland 45	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	0.13
Wetland 46	N	Y	N	Y	Y	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.29
Wetland 47	N	N	N	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	2.63
Wetland 48	N	Y	N	Y	Y	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.16
Wetland 49	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	20.83
Wetland 50	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	6.11
Wetland 51	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	2.35
Wetland 52	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	74.49
Wetland 52	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMC	NOT APPLICABLE	42.57
Wetland 53	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.32
Wetland 54	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	2.54
Wetland 55	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	2.36
Wetland 56	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.29
Wetland 57	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	26.00

Name	2003	2006	2009	2010	2012	2014	2015	2016	2015 LiDAR	NWI Wetland	USFWS Easement Wetland	Hydric Soil	Cowardin Type	Stream Name	Acres
Wetland 57	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMA	NOT APPLICABLE	0.32
Wetland 58	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.64
Wetland 59	N	N	Y	Y	N	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.19
Wetland 60	N	N	Y	N	N	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	0.14
Wetland 61	N	N	Y	Y	N	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.90
Wetland 62	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	3.37
Wetland 62	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMC	NOT APPLICABLE	0.85
Wetland 63	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.75
Wetland 64	N	N	Y	Y	N	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.72
Wetland 65	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	5.29
Wetland 66	N	N	Y	Y	N	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.20
Wetland 67	N	N	Y	Y	N	N	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	0.08
Wetland 68	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	2.30
Wetland 69	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.35
Wetland 70	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.23
Wetland 71	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.24
Wetland 72	N	Y	Y	Y	N	Y	Y	N	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.52
Wetland 73	N	N	Y	Y	N	Y	N	N	N	N	N	Y	PEMA	NOT APPLICABLE	0.18
Wetland 74	N	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.07
Wetland 75	N	Y	N	N	N	N	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	0.21
Wetland 76	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	46.78
Wetland 77	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	2.54
Wetland 78	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	31.97
Wetland 79	N	N	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.78
Wetland 80	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	37.35
Wetland 81	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.33
Wetland 82	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	0.35
Wetland 83	N	N	N	Y	N	Y	Y	N	Y	N	N	Y	PEMA	NOT APPLICABLE	0.19
Wetland 84	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	107.83
Wetland 85	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	4.41
Wetland 86	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PABF	NOT APPLICABLE	21.19
Wetland 87	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	16.31
Wetland 88	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	16.39
Wetland 89	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	3.84
Wetland 90	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	40.10
Wetland 91	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	4.33
Wetland 92	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	10.35
Wetland 93	N	Y	Y	N	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	1.31
Wetland 94	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	7.14
Wetland 95	N	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	1.67
Wetland 96	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMC	NOT APPLICABLE	2.87
Wetland 97	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PFOA	NOT APPLICABLE	2.60
Wetland 98	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	5.11
Wetland 99	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PFOA	NOT APPLICABLE	10.99

Name	2003	2006	2009	2010	2012	2014	2015	2016	2015 LiDAR	NWI Wetland	USFWS Easement Wetland	Hydric Soil	Cowardin Type	Stream Name	Acres
Wetland 100	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	0.70
Wetland 101	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	0.19
Wetland 102	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	RIVERINE	SOURIS RIVER	7.24
Wetland 103	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	1.24
Wetland 104	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PFOA	NOT APPLICABLE	15.87
Wetland 105	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	RIVERINE	SOURIS RIVER	6.70
Wetland 106	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PFOA	NOT APPLICABLE	6.00
Wetland 107	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	2.86
Wetland 108	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PFOA	NOT APPLICABLE	11.24
Wetland 109	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PFOA	NOT APPLICABLE	4.28
Wetland 110	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	1.11
Wetland 111	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PFOA	NOT APPLICABLE	0.49
Wetland 112	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMC	NOT APPLICABLE	0.19
Wetland 113	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	3.75
Wetland 114	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMBF	NOT APPLICABLE	32.81
Wetland 114	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMBF	NOT APPLICABLE	47.79
Wetland 115	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	PEMBF	NOT APPLICABLE	4.78
Wetland 116	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	21.64
Wetland 117	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	7.68
Wetland 118	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	RIVERINE	SPRING CREEK	0.29
Wetland 119	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	PEMA	NOT APPLICABLE	2.88
Wetland 120	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMA	NOT APPLICABLE	4.17
Wetland 121	Y	Y	Y	Y	Y	Y	Y	Y	NA	N	N	Y	PEMC	NOT APPLICABLE	0.65
Wetland 122	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	5.21
Wetland 123	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	14.59
Wetland 124	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	2.40
Wetland 125	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	3.53
Wetland 126	N	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	10.70
Wetland 127	N	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PFO	NOT APPLICABLE	2.24
Wetland 128	N	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	0.58
Wetland 129	N	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	0.64
Wetland 130	N	Y	Y	Y	Y	Y	N	Y	NA	N	N	Y	PEMC	NOT APPLICABLE	0.21
Wetland 131	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	1.77
Wetland 132	N	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	7.71
Wetland 133	N	Y	Y	Y	Y	Y	N	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	0.21
Wetland 134	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	28.28
Wetland 135	N	Y	Y	Y	Y	Y	Y	Y	NA	N	N	Y	PEMA	NOT APPLICABLE	1.78
Wetland 136	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	12.73
Wetland 137	N	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	1.52
Wetland 138	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	16.70
Wetland 139	N	N	Y	Y	Y	Y	Y	Y	NA	N	N	Y	PEMA	NOT APPLICABLE	1.26
Wetland 140	Y	Y	Y	Y	Y	Y	Y	Y	NA	N	N	Y	PEMA	NOT APPLICABLE	4.45
Wetland 141	N	Y	N	Y	Y	Y	Y	N	NA	N	N	Y	PEMA	NOT APPLICABLE	1.05
Wetland 142	N	Y	Y	Y	N	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	1.57
Wetland 143	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	1.70
Wetland 144	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	4.08
Wetland 145	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	7.47
Wetland 146	Y	Y	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMC	NOT APPLICABLE	17.70
Wetland 147	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	PEMC	NOT APPLICABLE	5.77
Wetland 148	Y	N	Y	Y	Y	Y	Y	Y	N	Y	N	Y	PEMA	NOT APPLICABLE	1.31
Wetland 149	N	N	N	N	N	Y	N	Y	N	N	N	Y	PEMA	NOT APPLICABLE	0.04
Wetland 150	N	N	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	0.81
Wetland 151	N	N	Y	Y	Y	Y	Y	Y	NA	Y	N	Y	PEMA	NOT APPLICABLE	3.29
														Total Acres	**1,749.0**

Wetland Delineation Report - Magic City Substation

AECOM

Submitted to
Xcel Energy
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

Submitted by
AECOM
1000 East Calgary Avenue, Suite 1
Bismarck, ND 58503
September 19, 2016

Wetland Delineation Report for the Magic City Substation

Xcel Energy

Ward County, North Dakota

EXECUTIVE SUMMARY

Xcel Energy (Xcel) contracted AECOM to conduct wetland delineations within the Magic City substation parcel (Project) near Minot, North Dakota in Ward County. The purpose of this report is to provide documentation and results of wetland delineations conducted on August 24, 2016 and an evaluation of potential Waters of the U.S. (WOTUS) as a follow up to the wetland desktop review on March 30, 2016, which identified seven potential wetland areas.

Three wetlands were delineated within the Project area. AECOM has evaluated the characteristics of Wetland-1 and Wetland-2 and has come to the conclusion that these wetlands appear to be non-relatively permanent waters (non-RPW) that are formed by geomorphic position, are isolated from jurisdictional waters, and appear to be without significant nexus. Wetland-3 is a depressional wetland along a road ditch and may have surface connectivity to a wetland complex to the east, which is connected to an unnamed tributary of the Souris River. Thus, Wetland-3 may be considered a WOTUS by the USACE due to connectivity.

However, these are the recommendations of AECOM based on our experience, observations and data collected in the field, and best professional judgement. The final authority over wetland jurisdiction is the responsibility of the USACE. AECOM recommends that an official jurisdictional determination (JD) be obtained from the USACE for the wetlands in question if any are expected to be impacted by construction activities. If all wetland impacts can be avoided during design and construction, then a JD is not needed.

STATEMENT OF LIMITATIONS

This report was prepared by the staff of AECOM under the supervision of experienced professionals. The data interpretation, conclusions, and recommendations presented in the report were governed by AECOM's experience and professional judgment. This report has been prepared based on data current at the time of preparation. Assumptions based on this data, although believed reasonable and appropriate based on the data provided herein, may not prove to be true in the future as new data are collected. The conclusions and recommendations of AECOM are conditioned upon these assumptions.

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1.0 INTRODUCTION

Xcel Energy plans to construct the Magic City Substation (Project) near Minot, North Dakota in Ward County. The proposed parcel encompasses approximately 50 acres and currently consists of an agricultural field. **Figure 1-1** displays the Project area.

Xcel Energy (Xcel) contracted AECOM to conduct wetland delineations within the Project area as a follow up to the wetland desktop review completed by AECOM on March 30, 2016. The wetland desktop review identified seven potential wetlands within the Project area based on topography, soil, hydrology, aerial imagery, and national wetland inventory (NWI) data. Field wetland delineations of the Project area were completed on August 24, 2016. The purpose of this report is to provide a summary of the field wetland delineations and an evaluation of potential Waters of the U.S. (WOTUS).

2.0 WETLAND DELINEATIONS

2.1 Field Wetland Delineation Methods

On August 24, 2016, two AECOM wetland scientists (Lindsey Meyers, PhD, PWS, and Ryan King) conducted wetland delineation activities within the Project area. The purpose of the field investigation was to identify potential wetland areas and evaluate whether the three mandatory criteria of hydrophytic vegetation, hydric soils, and wetland hydrology were present. Potential wetlands were located and the three criteria were evaluated to assess whether they met the wetland requirements. Data collected during the field work followed the procedures outlined in the U.S. Army Corps of Engineers (USACE) 1987 Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0) (USACE 2010).

The vegetation was assessed to determine the dominant species in the tree, shrub, and herbaceous vegetation strata. The percentage of areal cover was visually estimated for each species within each sampling plot. Hydrophytic vegetation boundaries were identified to aid in locating the approximate upland/wetland boundary, which was based on the percentage of hydrophytic plant species versus upland plant species. Vegetation information was recorded on USACE Wetland Determination Data Forms, which are provided in **Appendix A**.

The presence or absence of hydric soils was assessed through use of a shovel to collect soil cores. Soil descriptions were completed for each soil core using Munsell soil color charts, U.S. Department of Agriculture/Natural Resources Conservation Service (USDA/NRCS) soil texture, moisture content, special features, and horizon designation. Accepted field indicators were considered to determine if the hydric soils technical criteria were met (USDA, NRCS 2010). Soil core locations were selected by examining local topographical characteristics, as well as the extent of dominant hydrophytic vegetation. Soil conditions and hydric soil indicators were recorded on USACE Wetland Determination Data Forms for each wetland area identified (**Appendix A**).

Wetland hydrology was determined through observation of saturated soil conditions in the soil core hole and evaluation of surficial hydrologic indicators. Typical surface hydrologic indicators may include salt crust, surface soil cracks, and geomorphic position. Hydrology information was recorded on USACE Wetland Determination Data Forms (**Appendix A**).

Wetland boundaries were surveyed using a Trimble Geo7X™ handheld Global Positioning System (GPS) unit, which has sub-meter accuracy. Boundary location information was downloaded into an ArcView geographic information system (GIS) map project, which was used to create the maps in this report.

2.2 Field Wetland Delineation Results

Three wetland areas were identified and delineated within the Project area. **Figure 2-1** shows the wetland locations within the Project area. **Appendix B** provides a photographic log of the field delineations.

Wetland-1 was classified as a palustrine emergent wetland (PEM), using the Cowardin et. al. system of wetland classification (Cowardin et al.1979). Within the vicinity of the soil core, the wetland was dominated by green foxtail (*Setaria viridis*), foxtail barley (*Hordeum jubatum*), prostrate pigweed (*Amaranthus blitoides*), and western ragweed (*Ambrosia psilostachya*). The vegetation did not meet a

hydrophytic vegetation indicator, which is likely due to yearly mechanical removal of vegetation in the wetland. Based on the soil and hydrology indicators, it is believed that if the wetland was not significantly disturbed, hydrophytic vegetation would be expected to be dominant. Wetland hydrology was evidenced by salt crust (B11), surface soil cracks (B6) and saturation visible on aerial imagery (C9). Hydric soils were classified as having redox dark surface (F6).

Wetland-2 was classified as a PEM wetland. Within the vicinity of the soil core, the wetland was dominated by prostrate pigweed (*Amaranthus blitoides*), redroot pigweed (*Amaranthus retroflexus*), and green foxtail (*Setaria viridis*). The vegetation did not meet a hydrophytic vegetation indicator, which is likely due to yearly mechanical removal of vegetation in the wetland. Based on the soil and hydrology indicators, it is believed that if the wetland was not significantly disturbed, hydrophytic vegetation would be expected to be dominant. Wetland hydrology was evidenced by surface soil cracks (B6), saturation visible on aerial imagery (C9), and geomorphic position (D2). Hydric soils were classified as having redox dark surface (F6).

Wetland-3 was also classified as a PEM wetland. Within the vicinity of the soil core, the wetland was dominated by hybrid cattail (*Typha x glauca*). Wetland hydrology was evidenced by inundation visible on aerial imagery (B7), salt crust (B11), surface soil cracks (B6), and geomorphic position (D2). Hydric soils were classified as having redox dark surface (F6).

Wetland criteria were met in these areas due to the presence of positive wetland hydrology indicators, hydric soils, and hydrophytic vegetation (for Wetland-1 and Wetland-2, it is presumed that hydrophytic vegetation would be dominant were it not for the mechanical removal of vegetation).

3.0 DISCUSSION AND RECOMMENDATIONS

AECOM evaluated the wetlands associated with this project pursuant to the Supreme Court's January 9, 2001 decision in Solid Waste Agency of Northern Cook County vs. USACE (SWANCC decision) and the Supreme Court's June 19, 2006 decision in Rapanos vs. United States and Carabell vs. United States (Rapanos decision). The SWANCC decision states that Section 404 of the Clean Water Act (CWA §404) does not apply to isolated, non-navigable, wholly intrastate waters, where the only connection between the water body (or wetland) and interstate commerce is the use of the water as habitat for migratory birds. The Rapanos decision states that the agencies will decide jurisdiction over non-navigable tributaries and their adjacent wetlands based on a fact-specific analysis to determine if there is a significant nexus with Traditional Navigable Waters (TNWs). A significant nexus analysis assesses all hydrological and ecological functions of the tributary and its adjacent wetlands to determine their effects on downstream TNWs.

AECOM has evaluated the characteristics of Wetland-1 and Wetland-2 and has come to the conclusion that these wetlands appear to be non-relatively permanent waters (non-RPW) that are formed by geomorphic position, are isolated from jurisdictional waters, and appear to be without significant nexus. These wetlands appear to not have a significant biological, chemical, or physical impact on a TNW. There is no connectivity (either via culvert or surficial connectivity) and they do not provide pollution retention, flood storage, or habitat to species found in a TNW. Wetland-3 is a depressional wetland along a road ditch. However, Wetland-3 may have surface connectivity to a wetland complex to the east, which is connected to an unnamed tributary of the Souris River. Thus, Wetland-3 may be considered a WOTUS by the USACE due to surficial connectivity.

However, these are the recommendations of AECOM based on our experience, observations and data collected in the field, and best professional judgement. The final authority over wetland jurisdiction is the responsibility of the USACE. AECOM recommends that an official jurisdictional determination (JD) be obtained from the USACE for Wetland-1, Wetland-2, and Wetland-3.

4.0 LITERATURE CITED

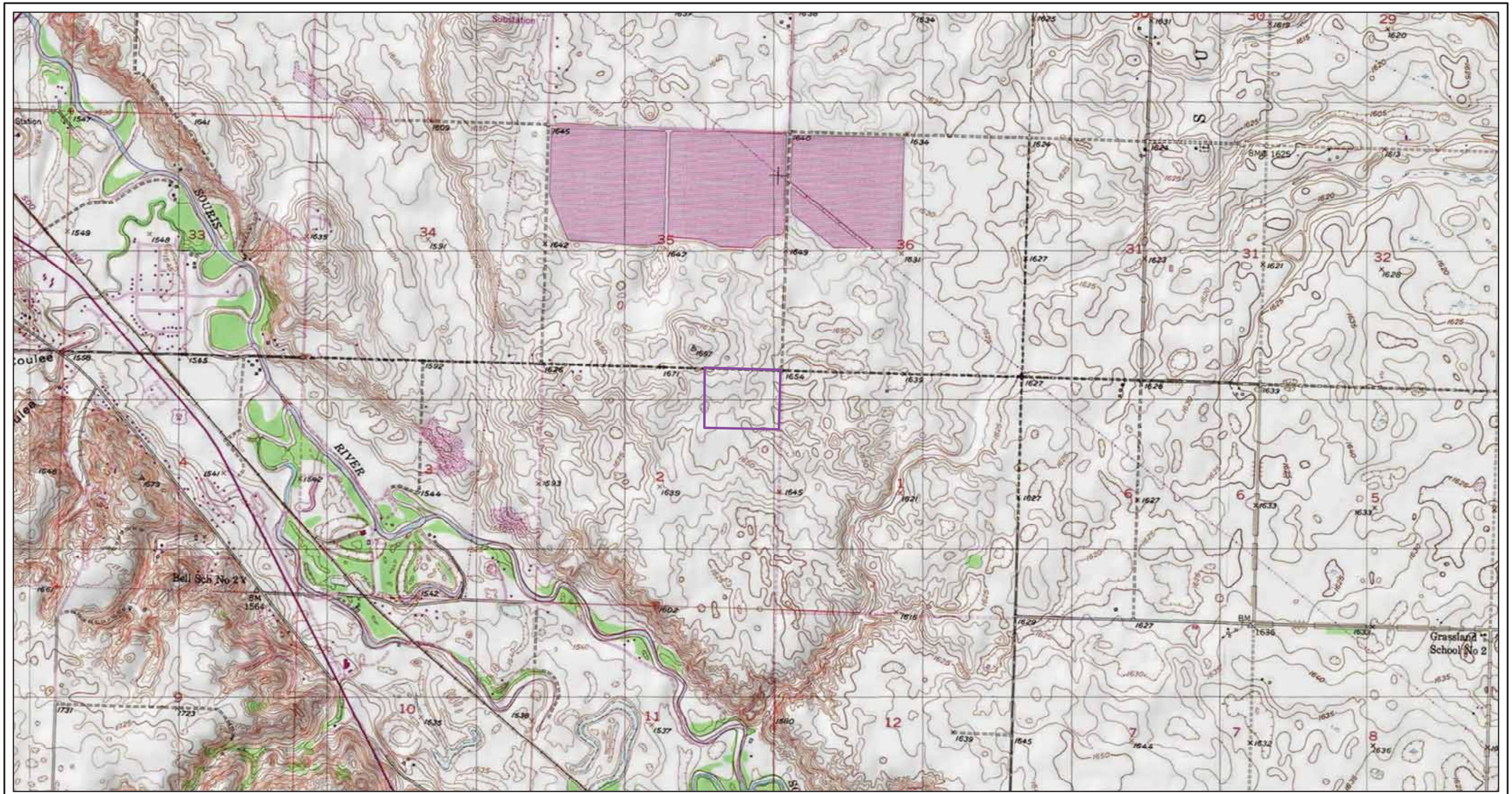
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Figures





Legend

Project Area

Figure 1-1 Proposed Project Area
Wetlands Survey
Ward County, North Dakota

0 1,300 2,600 5,200 Feet

AECOM
1000 East Calgary Ave.
Suite 1
Bismarck, ND 58503
www.AECOM.com

Drawn: MMM	9/12/2016
Approved: LMM	9/12/2016
Scale:	1:24,000
PROJECT NUMBER	60426815
FIGURE NUMBER	1-1





Legend

- Upland Soil Core
- Wetland Soil Core
- Project Area
- Wetland

Figure 2-1 Field Delineated Wetlands
Wetlands Survey
Ward County, North Dakota

0 115 230 460 Feet

AECOM
1000 East Calgary Ave.
Suite 1
Bismarck, ND 58503
www.AECOM.com

Drawn: MMM	9/20/2016
Approved: LMM	9/20/2016
Scale:	1:2,074
PROJECT NUMBER	60426815
FIGURE NUMBER	2-1

Appendix A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Magic City Substation | City/County: Ward | Sampling Date: 8/24/2016

Applicant/Owner: Xcel Energy | State: ND | Sampling Point: Wetland-1

Investigator(s): L. Meyers, R. King | Section, Township, Range: Section 2, T154N, R82W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none: Concave | Slope %: 0-2

Subregion (LRR): LLR-F | Lat: 48.19562639 | Long: -101.166817 | Datum: WGS 1984

Soil Unit Name: Svea-Hamerly-Tonka complex, 0 to 3 percent slopes, 30 percent hydric | NWI Classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y Soil Y or hydrology N Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N or hydrology N Naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampling Area within a Wetland?** Yes X No ____
Hydric Soils Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Wetland has been farmed. Soil and vegetation have been disturbed.
Photo of overview of wetland facing N

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Setaria viridis*	20	Yes	UPL
2. *Amaranthus blitoides*	10	Yes	FAC
3. *Hordeum jubatum*	10	Yes	FACW
4. *Ambrosia psilostachya*	8	Yes	FACU
5. *Convolvulus arvensis*	3	No	UPL
6. *Polygonum lapathifolium*	1	No	OBL
7.			
8.			
9.			
10.			
Total Cover:	52		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 60%

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index Worksheet:

Total % Cover of		Multiply by:	
OBL species	1	x1	1
FACW species	10	x2	20
FAC species	10	x3	30
FACU species	8	x4	32
UPL species	23	x5	115
Column Totals	52		198 (B)

Prevalence Index = B/A = **3.8**

Hydrophytic Vegetation Indicators:
____ Rapid Test for Hydrophytic Vegetation
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0*
____ Morphological Adaptations* (Provide supporting data in remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation (Explain)

*Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
The vegetation in this wetland is mechanically removed every year for planting cropland. Therefore, there are some upland species that are colonizing the wetland. If the vegetation was not significantly disturbed, then hydrophytic vegetation would be expected to be dominant.

SOIL

Sampling Point: **Wetland-1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10 YR 2/1	100%					Loam	Plowed
8-19	10 YR 3/2	70%	5 YR 3/4	30%	C	M	Loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depression (F16) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils*:**

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (explain in Remarks)

***Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ___

Hydric Soils Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- X Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Magic City Substation | City/County: Ward | Sampling Date: 8/24/2016

Applicant/Owner: Xcel Energy | State: ND | Sampling Point: Upland 1

Investigator(s): L. Meyers, R. King | Section, Township, Range: Section 2, T154N, R82W

Landform (hillside, terrace, etc.): Slight hillside | Local relief (concave, convex, none: Concave | Slope %: 0-2

Subregion (LRR): LLR-F | Lat: 48.19550879 | Long: -101.166799 | Datum: WGS 1984

Soil Unit Name: Barnes-Svea loams, 0 to 3 percent slopes, 6 percent hydric | NWI Classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y Soil Y or hydrology N Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N or hydrology N Naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampling Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soils Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks:
Photo of upland facing S

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Glycine max*	90	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	90		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 10%

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of		Multiply by:	
OBL species	0	x1	0
FACW species	0	x2	0
FAC species	0	x3	0
FACU species	0	x4	0
UPL species	90	x5	450
Column Totals	90		450 (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:
____ Rapid Test for Hydrophytic Vegetation
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0*
____ Morphological Adaptations* (Provide supporting data in remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

*Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **Upland 1**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-12	10 YR 2/1	100%					Loam	Plowed

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depression (F16) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils*:**

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (explain in Remarks)

***Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soils Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No **X**	Depth (inches): ___		
Water Table Present?	Yes ___	No **X**	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No **X**	Depth (inches): ___	**Wetland Hydrology Present?**	**Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Magic City Substation City/County: Ward Sampling Date: 8/24/2016

Applicant/Owner: Xcel Energy State: ND Sampling Point: Wetland-2

Investigator(s): L. Meyers, R. King Section, Township, Range: Section 2, T154N, R82W

Landform (hillside, terrace, etc.): Depression Local relief (concave, convex, none: Concave Slope %: 0-5

Subregion (LRR): LLR-F Lat: 48.19527268 Long: -101.167543 Datum: WGS 1984

Soil Unit Name: Barnes-Svea loams, 3 to 6 slopes, 6 percent hydric NWI Classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y Soil Y or hydrology N Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N or hydrology N Naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampling Area within a Wetland?**	**Yes X No ____**
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks:
Wetland has been farmed. Soil and vegetation have been disturbed.
Photo of overview of wetland facing N

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Amaranthus blitoides*	15	Yes	FAC
2. *Amaranthus retroflexus*	15	Yes	FACU
3. *Setaria viridis*	10	Yes	UPL
4. *Polygonum lapathifolium*	3	No	OBL
5. *Hordeum jubatum*	3	No	FACW
6. *Echinochloa crus-galli*	2	No	FAC
7.			
8.			
9.			
10.			
Total Cover:	48		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 60%

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index Worksheet:

Total % Cover of		Multiply by:	
OBL species	3	x1	3
FACW species	3	x2	6
FAC species	17	x3	51
FACU species	15	x4	60
UPL species	10	x5	50
Column Totals	48		170 (B)

Prevalence Index = B/A = **3.5**

Hydrophytic Vegetation Indicators:
____ Rapid Test for Hydrophytic Vegetation
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0*
____ Morphological Adaptations* (Provide supporting data in remarks or on a separate sheet)
X Problematic Hydrophytic Vegetation (Explain)

*Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: (Include photo numbers here or on a separate sheet.)
The vegetation in this wetland is mechanically removed every year for planting cropland. Therefore, there are some upland species that are colonizing the wetland. If the vegetation was not significantly disturbed, then hydrophytic vegetation would be expected to be dominant.

SOIL

Sampling Point: **Wetland-2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-8	10 YR 2/1	100%					Loam	Plowed
8-19	10 YR 3/2	80%	7.5 YR 3/4	20%	C	M	Loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depression (F16) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils*:**

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (explain in Remarks)

***Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ___

Hydric Soils Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- X Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No	X	Depth (inches):	___
Water Table Present?	Yes ___	No	X	Depth (inches):	___
Saturation Present? (includes capillary fringe)	Yes ___	No	X	Depth (inches):	___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Magic City Substation | City/County: Ward | Sampling Date: 8/24/2016

Applicant/Owner: Xcel Energy | State: ND | Sampling Point: Upland 2

Investigator(s): L. Meyers, R. King | Section, Township, Range: Section 2, T154N, R82W

Landform (hillside, terrace, etc.): Slight hillside | Local relief (concave, convex, none: Concave | Slope %: 0-2

Subregion (LRR): LLR-F | Lat: 48.19518918 | Long: -101.167738 | Datum: WGS 1984

Soil Unit Name: Barnes-Svea loams, 0 to 3 percent slopes, 6 percent hydric | NWI Classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y Soil Y or hydrology N Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N or hydrology N Naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ____	No X	**Is the Sampling Area within a Wetland?**	**Yes** ____ **No** X
Hydric Soils Present?	Yes ____	No X		
Wetland Hydrology Present?	Yes ____	No X		

Remarks:
Photo of upland facing W

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Glycine max*	85	Yes	UPL
2. *Setaria viridis*	10	No	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	95		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 5%

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of		Multiply by:	
OBL species	0	x1	0
FACW species	0	x2	0
FAC species	0	x3	0
FACU species	0	x4	0
UPL species	95	x5	475
Column Totals	95		475 (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:
____ Rapid Test for Hydrophytic Vegetation
____ Dominance Test is >50%
____ Prevalence Index is ≤3.0*
____ Morphological Adaptations* (Provide supporting data in remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation (Explain)

*Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **Upland 2**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-12	10 YR 2/1	100%					Loam	Plowed

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depression (F16) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils*:**

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (explain in Remarks)

***Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ___

Hydric Soils Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No **X**	Depth (inches): ___		
Water Table Present?	Yes ___	No **X**	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No **X**	Depth (inches): ___	**Wetland Hydrology Present?**	**Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Magic City Substation | City/County: Ward | Sampling Date: 8/24/2016

Applicant/Owner: Xcel Energy | State: ND | Sampling Point: Wetland-3

Investigator(s): L. Meyers, R. King | Section, Township, Range: Section 2, T154N, R82W

Landform (hillside, terrace, etc.): Depression | Local relief (concave, convex, none: Concave | Slope %: 0-5

Subregion (LRR): LLR-F | Lat: 48.1938692 | Long: -101.166746 | Datum: WGS 1984

Soil Unit Name: Svea-Hamerly-Tonka complex, 0 to 3 percent slopes, 30 percent hydric | NWI Classification: PEM1C

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation Y Soil Y or hydrology N Significantly disturbed? Are "Normal Circumstances" present? Yes X No ____

Are Vegetation N Soil N or hydrology N Naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampling Area within a Wetland?**	**Yes X No ____**
Hydric Soils Present?	Yes X	No ____		
Wetland Hydrology Present?	Yes X	No ____		

Remarks:
Wetland has been farmed. Soil and vegetation have been disturbed. It is adjacent to a section line road; the wetland continues east onto the next section
Photo of overview of wetland facing W

VEGETATION - Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 30 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Typha glauca*	90	Yes	OBL
2. *Hordeum jubatum*	15	No	FACW
3. *Polygonum lapathifolium*	10	No	OBL
4. *Setaria viridis*	5	No	UPL
5. *Potentilla argentea*	2	No	FACU
6.			
7.			
8.			
9.			
10.			
Total Cover:	122		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index Worksheet:

Total % Cover of		Multiply by:	
OBL species	100	x1	100
FACW species	15	x2	30
FAC species	0	x3	0
FACU species	2	x4	8
UPL species	5	x5	25
Column Totals	122		163 (B)

Prevalence Index = B/A = **1.3**

Hydrophytic Vegetation Indicators:
- X Rapid Test for Hydrophytic Vegetation
- X Dominance Test is >50%
- X Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation (Explain)

*Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? **Yes X No ____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **Wetland-3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10 YR 3/1	95%	7.5 YR 4/6	5%	C	PL	Loam	
6-17	10 YR 2/1	98%	2.5 YR 2.5/4	2%	C	M	Loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depression (F16) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils*:**

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (explain in Remarks)

***Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ___

Hydric Soils Present? **Yes** X **No** ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- X Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes ___	No X	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No X	Depth (inches): ___	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Magic City Substation City/County: Ward Sampling Date: 8/24/2016

Applicant/Owner: Xcel Energy State: ND Sampling Point: Upland 3

Investigator(s): L. Meyers, R. King Section, Township, Range: Section 2, T154N, R82W

Landform (hillside, terrace, etc.): Slight hillside Local relief (concave, convex, none: Concave Slope %: 0-2

Subregion (LRR): LLR-F Lat: 48.1940981 Long: -101.166864 Datum: WGS 1984

Soil Unit Name: Barnes-Svea loams, 0 to 3 percent slopes, 6 percent hydric NWI Classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks.)

Are Vegetation Y Soil Y or hydrology N Significantly disturbed? Are "Normal Circumstances" present? Yes X No

Are Vegetation N Soil N or hydrology N Naturally problematic? (if needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampling Area within a Wetland?**	**Yes** **No X**
Hydric Soils Present?	Yes	No X		
Wetland Hydrology Present?	Yes	No X		

Remarks:
Photo of upland facing N

VEGETATION - Use scientific names of plants.

Tree Stratum (Plot size: 30 ft radius)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Sapling/Shrub Stratum (Plot size: 15 ft radius)			
1.			
2.			
3.			
4.			
5.			
Total Cover:			
Herb Stratum (Plot size: 5 ft radius)			
1. *Glycine max*	100	Yes	UPL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
Total Cover:	100		
Woody Vine Stratum (Plot size: 30 ft radius)			
1.			
2.			
Total Cover:			

% Bare Ground in Herb Stratum 0%

Dominance Test Worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index Worksheet:

Total % Cover of		Multiply by:	
OBL species	0	x1	0
FACW species	0	x2	0
FAC species	0	x3	0
FACU species	0	x4	0
UPL species	100	x5	500
Column Totals	100		500 (B)

Prevalence Index = B/A = **5.0**

Hydrophytic Vegetation Indicators:
- ____ Rapid Test for Hydrophytic Vegetation
- ____ Dominance Test is >50%
- ____ Prevalence Index is ≤3.0*
- ____ Morphological Adaptations* (Provide supporting data in remarks or on a separate sheet)
- ____ Problematic Hydrophytic Vegetation (Explain)

*Indicators of hydric soil and wetland hydrology must be present

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: **Upland 3**

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(Inches)	Color (moist)	%	Color (moist)	%	Type*	Loc**	Texture	Remarks
0-6	10 YR 2/1	100%					Loam	Plowed
6-14	10 YR 3/4	100%					Loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (LRR F)
- ___ 1 cm Muck (A9) (LRR F, G, H)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ___ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depression (F16) (MLRA 72 & 73 of LRR H)

Indicators for Problematic Hydric Soils*:**

- ___ 1 cm Muck (A9) (LRR I, J)
- ___ Coast Prairie Redox (A16) (LRR F, G, H)
- ___ Dark Surface (S7) (LRR G)
- ___ High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (explain in Remarks)

***Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: None
Depth (inches): ___

Hydric Soils Present? **Yes** ___ **No** **X**

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) (where not tilled)
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10
- ___ Oxidized Rhizospheres on Living Roots (C3) (where tilled)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present?	Yes ___	No **X**	Depth (inches): ___		
Water Table Present?	Yes ___	No **X**	Depth (inches): ___		
Saturation Present? (includes capillary fringe)	Yes ___	No **X**	Depth (inches): ___	**Wetland Hydrology Present?**	**Yes** ___ **No** **X**

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Appendix B

Photographic Log

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation	60426815

Photo No.	Date
1	8-24-2016

Direction Photo Taken:

N

Description:

View of Wetland 1.



Photo No.	Date
2	8-24-2016

Direction Photo Taken:

S

Description:

View of Upland 1.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation	60426815

Photo No.	Date
3	8-24-2016

Direction Photo Taken:

N

Description:

View of Wetland 2.



Photo No.	Date
4	8-24-2016

Direction Photo Taken:

W

Description:

View of Upland 2.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation	60426815

Photo No.	Date
5	8-24-2016

Direction Photo Taken:

W

Description:

View of Wetland 3.



Photo No.	Date
6	8-24-2016

Direction Photo Taken:

N

Description:

View of Upland 3.



Appendix C

Custom Soil Resource Report

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Ward County, North Dakota



August 31, 2016

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (http://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the

individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ward County, North Dakota
Survey Area Data: Version 15, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 17, 2010—Jun 23, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Ward County, North Dakota (ND101)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
F2A	Tonka silt loam, 0 to 1 percent slopes	0.8	1.5%
F143B	Barnes-Svea loams, 3 to 6 percent slopes	41.4	82.4%
F151A	Svea-Hamerly-Tonka complex, 0 to 3 percent slopes	8.1	16.1%
Totals for Area of Interest		**50.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments

on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Ward County, North Dakota

F2A—Tonka silt loam, 0 to 1 percent slopes

Map Unit Setting

National map unit symbol: 2q3tm
Elevation: 950 to 2,530 feet
Mean annual precipitation: 16 to 23 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 110 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Tonka and similar soils: 73 percent
Minor components: 27 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tonka

Setting

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Local alluvium over till

Typical profile

Ap - 0 to 7 inches: silt loam
A - 7 to 13 inches: silt loam
E - 13 to 19 inches: loam
Bt - 19 to 34 inches: silty clay loam
2BC - 34 to 50 inches: clay loam
2Cg - 50 to 79 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: Wet Meadow (R055AY055ND)

Other vegetative classification: Wet (G055AY900ND)
Hydric soil rating: Yes

Minor Components

Parnell
Percent of map unit: 9 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Shallow Marsh (R055AY054ND)
Other vegetative classification: Not suited (G055AY000ND)
Hydric soil rating: Yes

Wyard
Percent of map unit: 6 percent
Landform: Swales on ground moraines, depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Subirrigated (R055AY048ND)
Other vegetative classification: Subirrigated (G055AY700ND)
Hydric soil rating: No

Vallers
Percent of map unit: 4 percent
Landform: Ground moraines, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear, concave
Ecological site: Wet Meadow (R055AY055ND)
Other vegetative classification: Wet (G055AY900ND)
Hydric soil rating: Yes

Hamerly
Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Limy Subirrigated (R055AY040ND)
Other vegetative classification: Subirrigated (G055AY700ND)
Hydric soil rating: No

Manfred
Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Saline Lowland (R055AY042ND)
Other vegetative classification: Not suited (G055AY000ND)
Hydric soil rating: Yes

Cavour
Percent of map unit: 2 percent

Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Claypan (R055AY039ND)
Other vegetative classification: Claypan (G055AY800ND)
Hydric soil rating: No

F143B—Barnes-Svea loams, 3 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2q4gr
Elevation: 950 to 2,530 feet
Mean annual precipitation: 16 to 23 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 110 to 150 days
Farmland classification: All areas are prime farmland

Map Unit Composition

Barnes and similar soils: 42 percent
Svea and similar soils: 21 percent
Minor components: 37 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Barnes

Setting

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 7 inches: loam
Bw - 7 to 16 inches: loam
Bk - 16 to 37 inches: loam
C - 37 to 79 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 48 to 79 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 30 percent

Gypsum, maximum in profile: 1 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (1.0 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Loamy (R055AY047ND)
Other vegetative classification: Loam (G055AY100ND)
Hydric soil rating: No

Description of Svea

Setting

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 8 inches: loam
A - 8 to 11 inches: loam
Bw - 11 to 22 inches: loam
Bk - 22 to 37 inches: loam
C - 37 to 79 inches: loam

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: B
Ecological site: Loamy Overflow (R055AY041ND)
Other vegetative classification: Loam (G055AY100ND)
Hydric soil rating: No

Minor Components

Balaton

Percent of map unit: 12 percent

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thin Loamy (R055AY052ND)
Other vegetative classification: Limy Upland (G055AY400ND)
Hydric soil rating: No

Buse

Percent of map unit: 9 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Thin Loamy (R055AY052ND)
Other vegetative classification: Limy Upland (G055AY400ND)
Hydric soil rating: No

Renshaw

Percent of map unit: 4 percent
Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: Shallow Gravel (R055AY046ND)
Other vegetative classification: Very Droughty Loam (G055AY130ND)
Hydric soil rating: No

Tonka

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Wet Meadow (R055AY055ND)
Other vegetative classification: Wet (G055AY900ND)
Hydric soil rating: Yes

Cresbard

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Clayey (R055AY038ND)
Other vegetative classification: Clayey Subsoil (G055AY210ND)
Hydric soil rating: No

Parnell

Percent of map unit: 3 percent
Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Shallow Marsh (R055AY054ND)
Other vegetative classification: Not suited (G055AY000ND)
Hydric soil rating: Yes

Swenoda

Percent of map unit: 3 percent
Landform: Ground moraines
Landform position (three-dimensional): Talf
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: Loamy Overflow (R055AY041ND)
Other vegetative classification: Overflow (G055AY500ND)
Hydric soil rating: No

F151A—Svea-Hamerly-Tonka complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2q4h6
Elevation: 950 to 2,530 feet
Mean annual precipitation: 16 to 23 inches
Mean annual air temperature: 36 to 43 degrees F
Frost-free period: 110 to 150 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Svea and similar soils: 40 percent
Hamerly and similar soils: 26 percent
Tonka and similar soils: 16 percent
Minor components: 18 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Svea

Setting

Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 8 inches: loam
A - 8 to 11 inches: loam
Bw - 11 to 22 inches: loam
Bk - 22 to 37 inches: loam
C - 37 to 79 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Moderately well drained
Runoff class: Low

Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 36 to 60 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 25 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to slightly saline (1.0 to 4.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 4.0
Available water storage in profile: High (about 10.5 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2c
Hydrologic Soil Group: B
Ecological site: Loamy (R055AY047ND)
Other vegetative classification: Loam (G055AY100ND)
Hydric soil rating: No

Description of Hamerly

Setting

Landform: Ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy till

Typical profile

Ap - 0 to 8 inches: loam
Bk - 8 to 35 inches: loam
BCk - 35 to 43 inches: loam
C - 43 to 79 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately low to moderately high (0.14 to 1.42 in/hr)
Depth to water table: About 18 to 42 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 45 percent
Gypsum, maximum in profile: 3 percent
Salinity, maximum in profile: Slightly saline to moderately saline (4.0 to 8.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 7.0
Available water storage in profile: High (about 9.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2e
Hydrologic Soil Group: C
Ecological site: Limy Subirrigated (R055AY040ND)
Other vegetative classification: Subirrigated (G055AY700ND)

Hydric soil rating: No

Description of Tonka

Setting

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Parent material: Local alluvium over till

Typical profile

Ap - 0 to 7 inches: silt loam
A - 7 to 13 inches: silt loam
E - 13 to 19 inches: loam
Bt - 19 to 34 inches: silty clay loam
2BC - 34 to 50 inches: clay loam
2Cg - 50 to 79 inches: loam

Properties and qualities

Slope: 0 to 1 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Poorly drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Moderately low (0.01 to 0.14 in/hr)
Depth to water table: About 0 to 18 inches
Frequency of flooding: None
Frequency of ponding: Frequent
Calcium carbonate, maximum in profile: 10 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.0 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: High (about 10.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: C/D
Ecological site: Wet Meadow (R055AY055ND)
Other vegetative classification: Wet (G055AY900ND)
Hydric soil rating: Yes

Minor Components

Vallers, moderately saline

Percent of map unit: 8 percent
Landform: Ground moraines, depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Linear, concave
Ecological site: Saline Lowland (R055AY042ND)
Other vegetative classification: Saline (G055AY895ND)
Hydric soil rating: Yes

Parnell

Percent of map unit: 6 percent

Landform: Depressions
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Shallow Marsh (R055AY054ND)
Other vegetative classification: Not suited (G055AY000ND)
Hydric soil rating: Yes

Wyard

Percent of map unit: 2 percent
Landform: Swales on ground moraines, depressions on ground moraines
Landform position (three-dimensional): Dip
Down-slope shape: Concave
Across-slope shape: Concave
Ecological site: Subirrigated (R055AY048ND)
Other vegetative classification: Subirrigated (G055AY700ND)
Hydric soil rating: No

Barnes

Percent of map unit: 2 percent
Landform: Ground moraines
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Loamy (R055AY047ND)
Other vegetative classification: Loam (G055AY100ND)
Hydric soil rating: No

Soil Information for All Uses

Suitabilities and Limitations for Use

The Suitabilities and Limitations for Use section includes various soil interpretations displayed as thematic maps with a summary table for the soil map units in the selected area of interest. A single value or rating for each map unit is generated by aggregating the interpretive ratings of individual map unit components. This aggregation process is defined for each interpretation.

Land Classifications

Land Classifications are specified land use and management groupings that are assigned to soil areas because combinations of soil have similar behavior for specified practices. Most are based on soil properties and other factors that directly influence the specific use of the soil. Example classifications include ecological site classification, farmland classification, irrigated and nonirrigated land capability classification, and hydric rating.

Hydric Rating by Map Unit

This rating indicates the percentage of map units that meets the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric soil or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor nonhydric components in the higher positions on the landform, and map units that are made up dominantly of nonhydric soils may have small areas of minor hydric components in the lower positions on the landform. Each map unit is rated based on its respective components and the percentage of each component within the map unit.

The thematic map is color coded based on the composition of hydric components. The five color classes are separated as 100 percent hydric components, 66 to 99 percent hydric components, 33 to 65 percent hydric components, 1 to 32 percent hydric components, and less than one percent hydric components.

In Web Soil Survey, the Summary by Map Unit table that is displayed below the map pane contains a column named 'Rating'. In this column the percentage of each map unit that is classified as hydric is displayed.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Under natural conditions, these soils are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

The NTCHS definition identifies general soil properties that are associated with wetness. In order to determine whether a specific soil is a hydric soil or nonhydric soil, however, more specific information, such as information about the depth and duration of the water table, is needed. Thus, criteria that identify those estimated soil properties unique to hydric soils have been established (Federal Register, 2002). These criteria are used to identify map unit components that normally are associated with wetlands. The criteria used are selected estimated soil properties that are described in "Soil Taxonomy" (Soil Survey Staff, 1999) and "Keys to Soil Taxonomy" (Soil Survey Staff, 2006) and in the "Soil Survey Manual" (Soil Survey Division Staff, 1993).

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field. These visible properties are indicators of hydric soils. The indicators used to make onsite determinations of hydric soils are specified in "Field Indicators of Hydric Soils in the United States" (Hurt and Vasilas, 2006).

References:

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

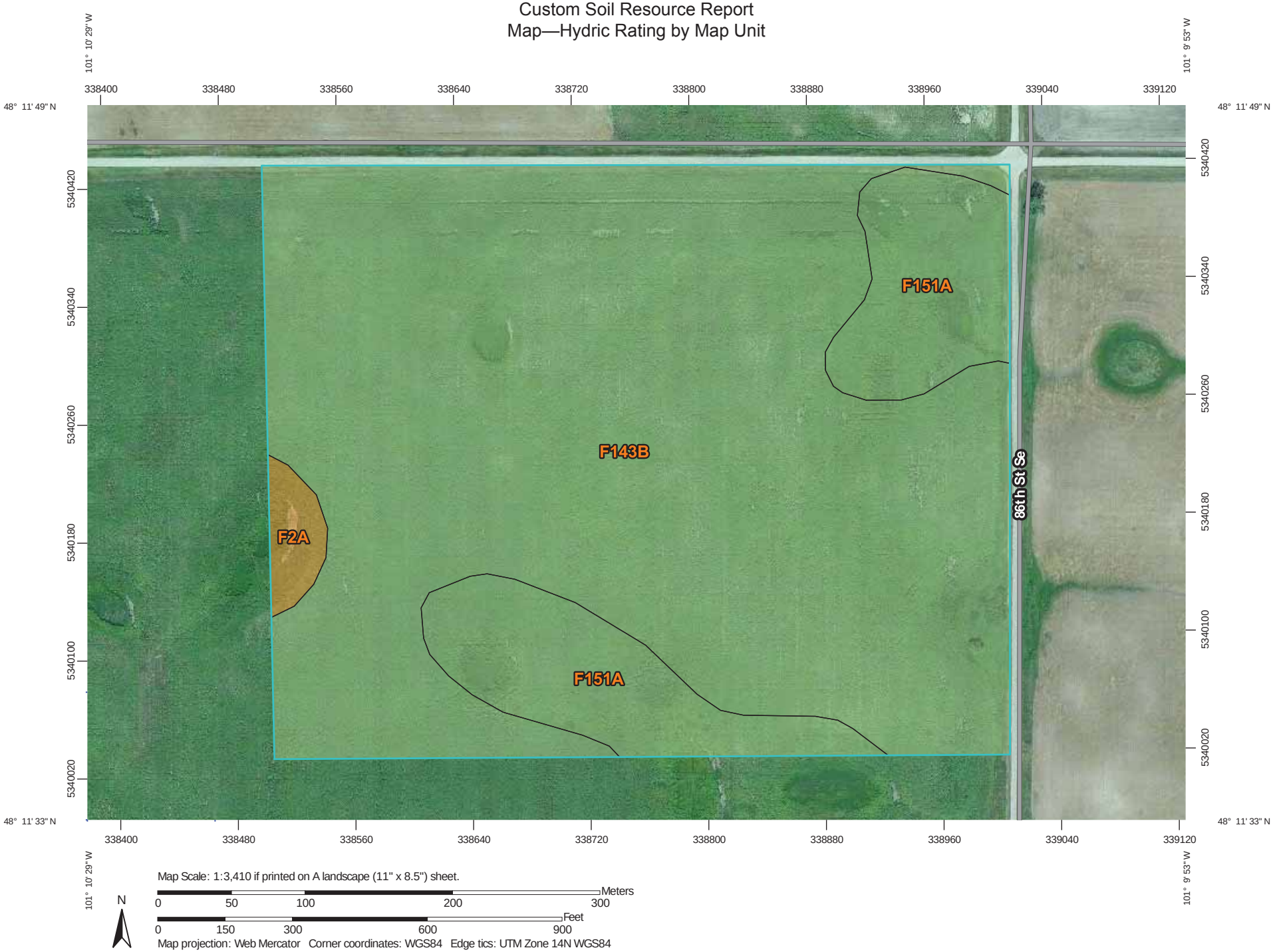
Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18.

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service. U.S. Department of Agriculture Handbook 436.

Soil Survey Staff. 2006. Keys to soil taxonomy. 10th edition. U.S. Department of Agriculture, Natural Resources Conservation Service.

Custom Soil Resource Report
Map—Hydric Rating by Map Unit



MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Lines
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Soil Rating Points
- Hydric (100%)
- Hydric (66 to 99%)
- Hydric (33 to 65%)
- Hydric (1 to 32%)
- Not Hydric (0%)
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Ward County, North Dakota
Survey Area Data: Version 15, Sep 25, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 17, 2010—Jun 23, 2010

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—Hydric Rating by Map Unit

Hydric Rating by Map Unit— Summary by Map Unit — Ward County, North Dakota (ND101)				
Map unit symbol	**Map unit name**	**Rating**	**Acres in AOI**	**Percent of AOI**
F2A	Tonka silt loam, 0 to 1 percent slopes	89	0.8	1.5%
F143B	Barnes-Svea loams, 3 to 6 percent slopes	6	41.4	82.4%
F151A	Svea-Hamerly-Tonka complex, 0 to 3 percent slopes	30	8.1	16.1%
Totals for Area of Interest			**50.3**	**100.0%**

Rating Options—Hydric Rating by Map Unit

Aggregation Method: Percent Present

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

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Wetland Delineation Report - McHenry Substation

Wetland Delineation Report
McHenry Substation

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Wetland Delineation Report
McHenry Substation

December 2016

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1.0 Introduction

Barr Engineering Co. (Barr) was retained by Great River Energy (GRE) to complete a wetland delineation on property owned by GRE (Site), a portion of which is currently occupied by the McHenry power substation. The Site is located at 4193 14th Ave. North in Section 2, Township 152N, Range 80W, in McHenry County, North Dakota (Figure 1). The Site is located approximately 3 miles southeast of the town of Velva, North Dakota.

The purpose of the wetland delineation was to delineate wetlands located on the Site for potential future expansion projects. The delineation was conducted within the Site boundary, which consisted of two areas: Investigation Area 1 and Investigation Area 2 (Figure 1). Surveys were conducted on September 19, 2016 within Investigation Area 1, and on November 16, 2016 within Investigation Area 2 by Lindsay Tekler, an environmental scientist at Barr. The total area of investigation is approximately 14.38 acres in size.

2.0 Report Author and Qualifications

Lindsay Tekler has more than 5 years of experience in the environmental science and natural resources fields, focused on wetland mitigation plan development, environmental review, and environmental permit application development and compliance for energy transmission, fuels, and transportation projects. Lindsay leads and conducts a variety of environmental surveys, including wetland delineations and botanical surveys. Lindsay has been conducting and leading wetland delineations for over 5 years in the upper Midwest area.

3.0 Wetland Delineation and Classification Methods

The wetland delineation was conducted according to guidance from the U.S. Army Corps of Engineers (USACE), including the Routine On-Site Determination Method as specified in the *1987 U.S. Army Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (USACE 2010).

Wetland boundaries were defined by sampling in a wetland and an adjacent upland in a series of paired plots. The observations at each sampling plot were recorded on wetland determination data forms. Site data was collected for soils, vegetation, and hydrology at each sample plot. Soils were examined to a depth of at least 24 inches below the ground surface, except where auger refusal limited the soil boring. Representative soil samples from each boring were examined for color, texture, and the presence of hydric soil indicators. Soil colors (e.g., 7.5YR 4/2, etc.) were determined using Munsell® soil color charts, and soil textures were classified by feel. The NRCS hydric soil indicators (Version 7.0, 2010) were used to identify hydric soils. Hydrologic conditions were evaluated at each sample plot by documenting the presence or absence of primary (e.g. surface water) and/or secondary (e.g. geomorphic position) hydrology indicators. Plant species at each sample plot were identified, and percent areal cover was estimated. Dominant species were determined using the 50/20 rule (USACE 1987), and the corresponding wetland indicator status of each plant species was recorded using the current National Wetland Plant List (USACE 2014). A determination of hydrophytic vegetation status was made using the rapid test, dominance test, and prevalence index (USACE 1987). Photographs were taken of the study area and at the sample plots to document site conditions.

Wetland boundaries were collected on site using a Trimble GeoXH 6000 Global Positioning System (GPS) Unit, capable of recording positions with sub-foot horizontal accuracy. Wetland boundaries were later digitized in ArcMap© 10.3 Geographic Information System (GIS) software.

Delineated wetlands were classified using the USFWS Cowardin System (Cowardin et al. 1979) and the Eggers and Reed Plant Community Classification System (Eggers and Reed 2011).

4.0 Background Information

Prior to conducting the wetland delineation, the following background information was consulted to determine general site characteristics and to evaluate the probability and locations of potential wetlands within the Site.

4.1 Antecedent Precipitation

Monthly precipitation data from a weather station near the Site was compared with historic Climate Analysis for Wetlands (WETS) Table precipitation data (Table 1) for Velva, ND from a 30-year dataset (1971—2000) to determine if normal hydrologic and climatic conditions were present on-site during the delineation (BWSR 2015).

For the delineation in Investigation Area 1, the observed precipitation data from three months prior to the delineation indicated normal precipitation in June, July, and August. As a result of this antecedent precipitation data, Barr determined that normal hydrologic conditions were present at the time of the delineation (Table 1) conducted on September 19, 2016.

For the delineation in Investigation Area 2, the observed precipitation data from three months prior to the delineation indicated normal conditions in August and October and wetter than normal conditions in September. As a result of this antecedent precipitation data, Barr determined that normal hydrologic conditions were present at the time of the delineation (Table 1) conducted on November 16, 2016

4.2 Topography and Land Use

The U.S. Geological Survey (USGS) topographic map shows a gradual slope to the northeast within the Site (Figure 2). Lower drainage areas were located outside of the fenced substation. The site is surrounded by roads, which has altered the gradual slope to the northeast by creating raised roadways and other developed features.

The Site is currently used for a power substation. The current use of adjoining properties includes agricultural land to the west, pasture land to the northwest, Central Power Electric substation to the north, and an ADM Canola Plant to the east and southeast.

4.3 Existing Wetland and Waterway Mapping

The northwest portion of the Site is mapped as wetland by current National Wetland Inventory (NWI) mapping as freshwater emergent wetland (Figure 3). Current waterway mapping does not show any waterways within the Site (Figure 3). The site conditions found at the time of the delineation are further discussed in Section 5.

4.4 Mapped Soils

The NRCS *Soil Survey of McHenry County* identified two soil map units within the Site (Figure 4). A detailed description of each NRCS mapped soil type can be found in Table 2

5.0 Wetland Delineation Results and Discussion

Barr completed the wetland delineation on September 19 and November 16, 2016. A total of 0.83 acres of wetland was delineated, comprising 6percent of the approximately 14.38 acre project area. A description of the identified wetlands, associated sampling plots, and other site conditions is provided below.

The locations of the sampling plots and wetland boundaries can be found in Figure 5. Documentation of site conditions can be found in the wetland determination data forms (Appendix A) and site photographs (Appendix B). A summary of the delineated wetlands can be found in Table 3.

5.1 Wetland 1

This wetland is located in Investigation Area 1, on the south side of the McHenry substation and is considered a palustrine emergent, persistent (PEM1) or wet meadow type wetland (Figure 5). The wetland is approximately 0.06 acres in size and does not extend beyond the Site.

At the wetland sample plot (1-W), the dominant plant species were redroot pigweed (*Amaranthus retroflexus,* FACU*)* and tearthumb (*Persicaria sagittata,* OBL). The vegetation within the wetland was disturbed by regularly mowing. The observed soil texture was silty clay loam, with 10 percent prominent redoximorphic (redox) concentrations in the upper 8 inches, meeting the requirement to fulfil the redox dark surface (F6) hydric soil indicator. Auger refusal from coarse fragments prevented a deeper soil boring. Wetland hydrology was indicated by secondary indicators of surface soil cracks, a sparsely vegetated concave surface, and a depressional geomorphic position.

At the paired upland plot (1-U), the dominant plant species were Kentucky bluegrass (*Poa pratensis,* FACU) and common dandelion (*Taraxacum officinale,* FACU). Soil was silt loam and did not contain any redox features. No indicators of wetland hydrology were observed.

5.2 Wetland 2

This wetland is located in Investigation Area 1, near the toe-of-slope of an access road along the eastern edge of the Site and is considered PEM1 or wet meadow type wetland (Figure 5). The wetland is approximately 0.06 acres in size within the project area, and continues beyond the Site to the east to the toe-of-slope of the adjacent road.

At the wetland sample plot (2-W), the dominant plant species were narrow-leaved cattail (*Typha angustifolia,* OBL*)* and giant reed (*Phragmites australis,* FACW*).* The vegetation within the wetland was disturbed as it is regularly mowed. The observed soil texture is mucky loam, with 8 percent prominent redox concentrations to 12 inches below the surface. This meets the requirements to fulfil the redox dark surface and loamy mucky mineral (F1) hydric soil indicators. Auger refusal due to coarse fragments prevented boring deeper than 12 inches. Wetland hydrology was indicated by primary indicators of 0.5 inches of surface water, saturation and water table at the surface, and water-stained leaves, as well as secondary indicators of surface soil cracks, a depressional geomorphic position, and a positive FAC-neutral test.

At the paired upland plot (2-U), the dominant plant species was Kentucky bluegrass. Soil was silt loam and did not contain any redox features. No indicators of wetland hydrology were observed.

5.3 Wetland 3

This wetland is located in Investigation Area 1, at the toe-of-slope of Highway 97 and 14th Avenue North and is considered PEM1 type wetland (Figure 5). This wetland is a mixture of wet meadow (approximately 0.04 acres in size) and shallow marsh (approximately 0.29 acres in size) and does not extend beyond the Site. The boundaries of this wetland approximately correlated with the NWI mapped wetland on the Site.

At the wetland sample plot (3-W), the dominant plant species were needle spikerush (*Eleocharis acicularis,* OBL*)* and narrow-leaved cattail. A portion of the vegetation within the wetland was disturbed as it is regularly mowed. The observed soil texture was mucky loam over clay loam, with 15 percent prominent redox concentrations beginning at 5 inches below the ground surface, meeting the requirement to fulfil the loamy mucky mineral hydric soil indicator. Auger refusal due to coarse fragments prevented boring deeper than 14 inches. Wetland hydrology was indicated by primary indicators of 0.5 inches of surface water, saturation and water table at the surface, presence of an algal mat, and water-stained leaves, as well as secondary indicators of a depressional geomorphic position and a positive FAC-neutral test.

At the paired upland plot (3-U), the dominant plant species were Kentucky bluegrass and quack grass (*Elymus repens,* FACU). Soil was silt loam and did not contain any redox features. No indicators of wetland hydrology were observed.

5.4 Wetland 4

This wetland is located in Investigation Area 2 and is considered PEM1 type wetland (Figure 5). Wetland 4 consists of two depressional shallow marshes, wetland 4A (approximately 0.12 acres in size) and wetland 4B (approximately 0.12 acres in size), which are connected via a culvert underneath an upland berm (Appendix B, photo 22).

At the wetland sample plot (4-W), the dominant plant species were eastern cottonwood (*Populus deltoides,* FAC*)* and narrow-leaved cattail. The observed soil texture was silt clay loam over clay loam, with 10 percent prominent redox concentrations and depletions beginning at the ground surface, meeting the requirement to fulfil the redox dark surface and depleted dark surface hydric soil indicators. Wetland hydrology was indicated by the primary indicator of water-stained leaves, as well as secondary indicators of a depressional geomorphic position and a positive FAC-neutral test.

At the paired upland plot (4-U), the dominant plant species were Kentucky bluegrass and smooth brome grass (*Bromus inermis,* UPL). Soil was silt loam over fine sandy loam and did not contain any redox features. No indicators of wetland hydrology were observed.

5.5 Wetland 5

This wetland is located in Investigation Area 2 and is considered PFO1 type wetland (Figure 5). This wetland is approximately 0.14 acres in size and does not extend beyond the Site.

At the wetland sample plot (5-W), the dominant plant species were eastern cottonwood, Missouri River willor (*Salix eriocephala,* FACW), quack grass, and Kentucky bluegrass. The observed soil texture was silt loam over fine sandy loam, with 5 percent prominent redox concentrations and 10 percent depletions beginning at the ground surface, meeting the requirement to fulfil the redox dark surface hydric soil indicator. Wetland hydrology was indicated by a primary indicators of water-stained leaves, as well as secondary indicators of a depressional geomorphic position and a sparsely vegetated concave surface.

At the paired upland plot (3-U), the dominant plant species were Kentucky bluegrass, quack grass, and eastern cottonwood. Soil was silt loam over fine sandy loam and did not contain any redox features. No indicators of wetland hydrology were observed.

5.6 Water Conveyance Features

Two upland swales were found within the Site. One was approximately 10 feet wide, located in the northeast corner of Investigation Area 1, and the other was approximately 4 feet wide and was located in the southwest corner of Investigation Area 1. These swales were examined and did not display wetland hydrology or hydrophytic vegetation. Soil samples taken within the swales confirmed that hydric soils were not present. There was no water in the swales at the time of the delineation. There were no water conveyance features found in Investigation Area 2.

6.0 Summary and Conclusion

Barr completed a wetland delineation within the approximately 14.38 acre Site located in McHenry County, North Dakota. Based on a field investigation conducted on September 19 and November 16, 2016, it is our professional opinion that five wetlands totaling approximately 0.83 acres exist within the Site.

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Figures

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Investigation Area 1

Investigation Area 2

N

0 300 600

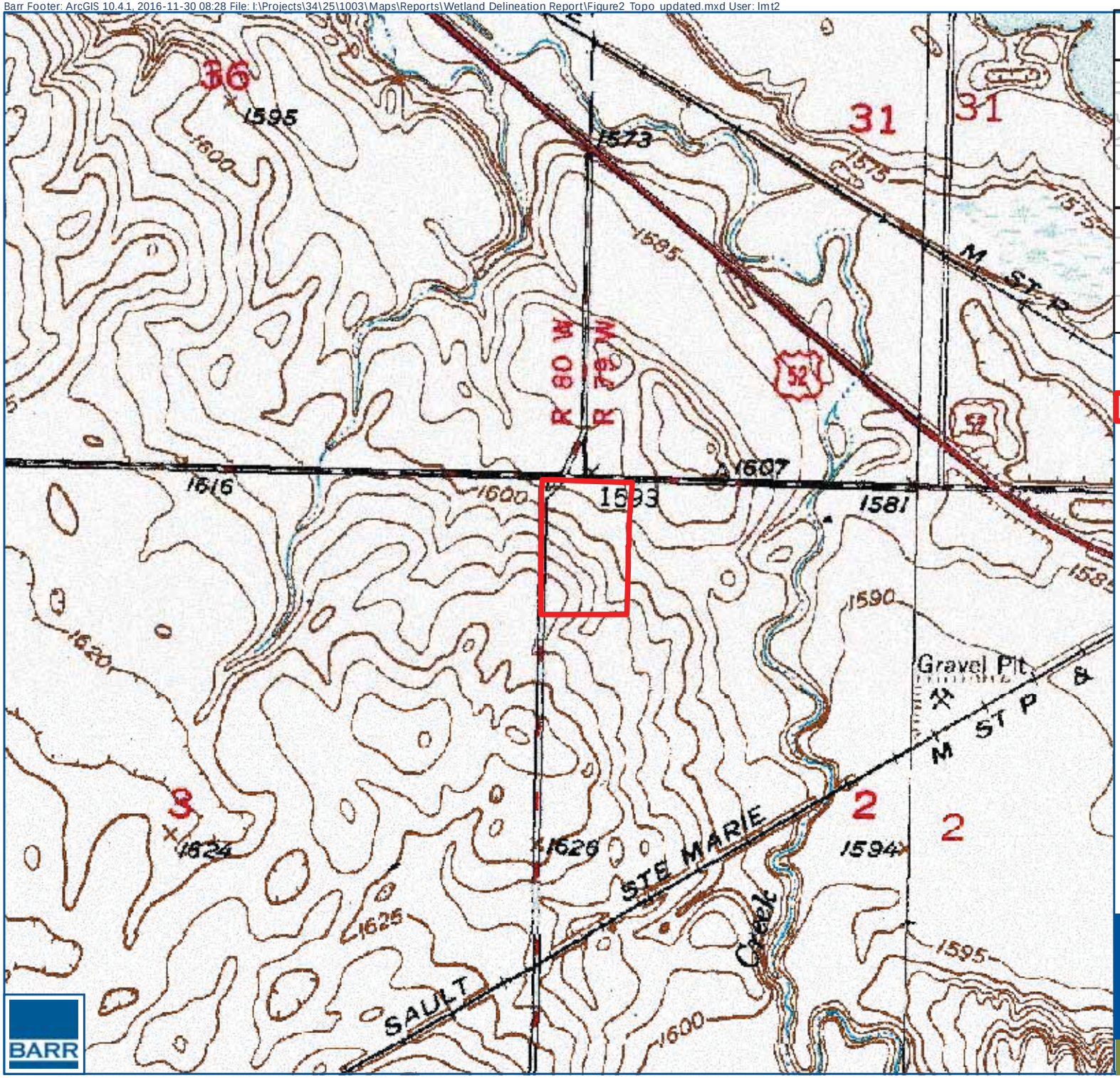
Feet

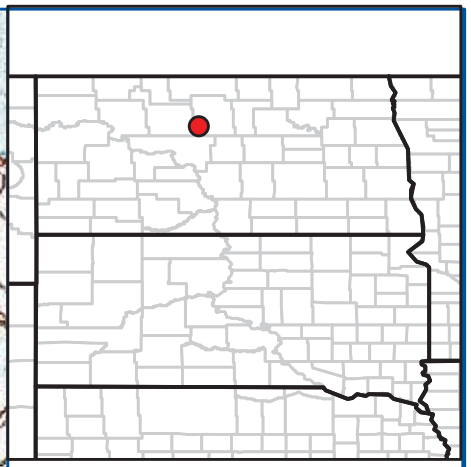
1 Inch = 300 Feet

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Figure 1: Site Location

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Total Investigation Area/Site

N

0 1,000 2,000

Feet

1 Inch = 1,000 Feet

BARR

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Figure 2: Topographic Map

Barr Footer: ArcGIS 10.4.1, 2016-11-30 08:34 File: I:\Projects\34\25\1003\Maps\Reports\Wetland Delineation Report\Figure3_NWI_updated.mxd User: lmt2





Waterways

Total Investigation Area/Site

National Wetlands Inventory

Freshwater Emergent Wetland

Freshwater Pond

N

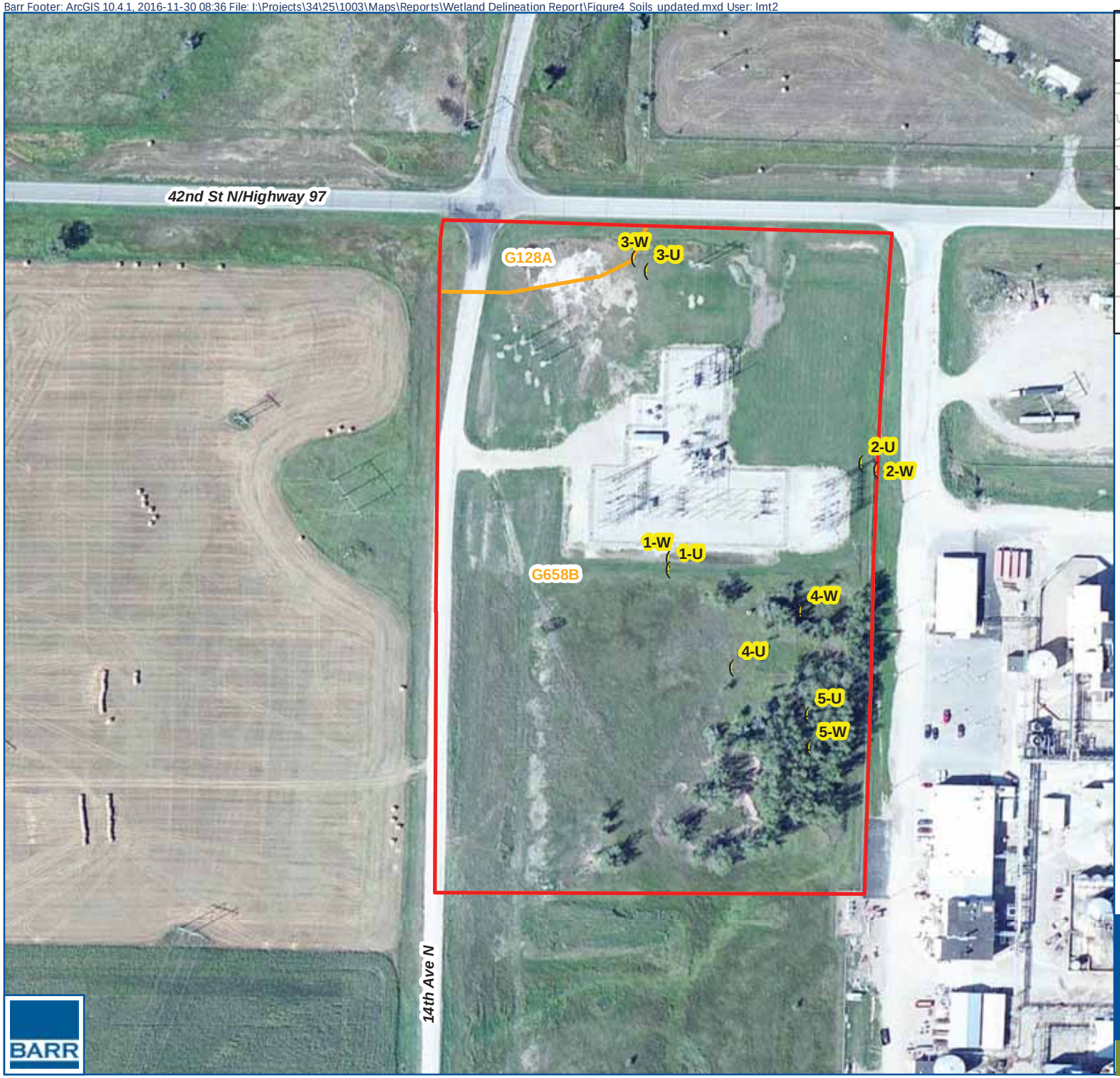
0 500 1,000

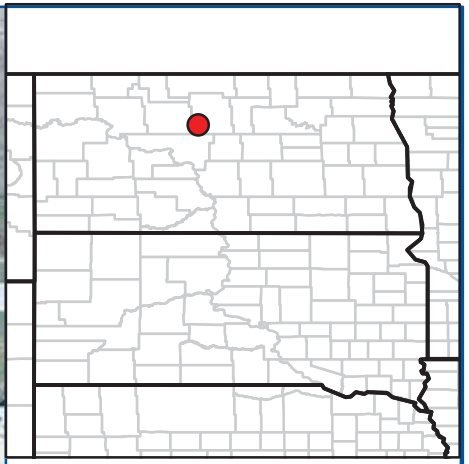
Feet

1 Inch = 500 Feet

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Great River Energy

Figure 3: NWI Mapped Wetlands





(Sampling Plots

Total Investigation Area/Site

NRCS Mapped Soil Units

N

0 200 400

Feet

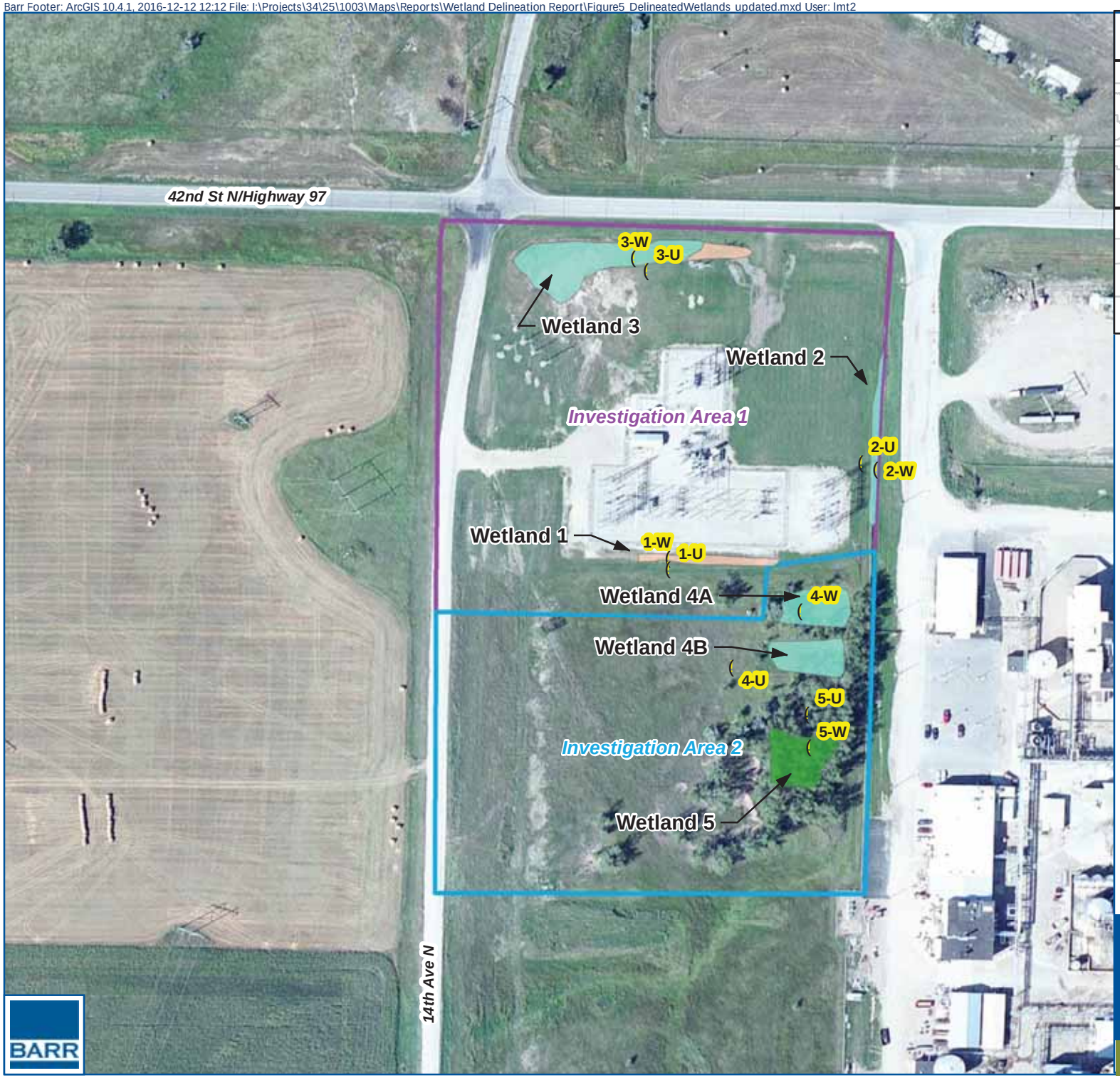
1 Inch = 200 Feet

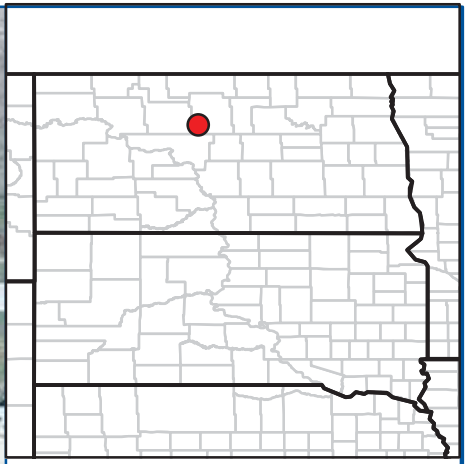
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Figure 4: NRCS Mapped Soils

BARR

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(Sampling Plots

Investigation Area 1

Investigation Area 2

Delineated Wetlands

PEM1/Wet Meadow

PEM1/Shallow Marsh

PFO1/Wooded Swamp

N

0 200 400

Feet

1 Inch = 200 Feet

BARR

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Figure 5: Delineated Wetlands

Tables

Table 1. Antecedent Precipitation

Month	WETS: 1971 - 2000			Monthly Precipitation Amount (inches)				
		30% chance						
	Average	less than	more than	2012	2013	2014	2015	2016
January	0.68	0.36	0.84	*0.09*	*0.11*	*0.19*	*0.19*	*0.21*
February	0.50	0.25	0.61	*0.14*	0.38	*0.17*	*0.23*	0.36
March	0.78	0.41	0.96	0.73	0.61	*0.05*	*0.37*	0.41
April	1.34	0.35	1.58	2.78	0.47	1.80	0.59	2.16
May	2.30	1.18	2.81	1.80	6.71	1.59	2.70	1.99
June	3.22	2.10	3.87	3.45	4.53	5.05	4.03	2.74
July	2.80	1.90	3.34	*0.67*	4.35	*1.72*	*1.87*	2.73
August	1.83	1.10	2.22	*1.06*	2.76	3.77	1.30	1.24
September	1.62	0.95	1.99	*0.18*	2.16	*0.85*	1.61	2.98
October	1.61	0.48	1.91	2.02	2.32	*0.28*	1.11	1.36
November	0.92	0.29	1.11	0.59	*0.15*	*0.18*	*0.13*	N/A
December	0.50	0.23	0.61	*0.20*	*0.18*	*0.01*	0.31	N/A

Legend:
Bold = above normal range
Italics = below normal range

Sources:

- NRCS Velva, ND Station WETS: http://agacis.rcc-acis.org/38049/wets
- Weather Underground Minot, ND Station monthly precipitation amounts: https://www.wunderground.com/history/airport/KMOT/2016/10/11/DailyHistory.html?req_city=Velva&req_state=ND&reqdb.zip=58790&reqdb.magic=1&reqdb.wmo=99999

Formula to determine if normal hydrologic conditions are present:

$$Y = 1(x1) + 2(x2) + 3(x3)$$

Where (x1) = precipitation normality value for 3 months before the delineation
Where (x2) = precipitation normality value for 2 months before the delineation
Where (x3) = precipitation normality value for 1 month before the delineation
(Precipitation normality values are: 1 for below normal range, 2 for within normal range, and 3 for above normal range)

Y value of 6-9 indicates dry conditions
Y value of 10-14 indicates normal conditions
Y value of 15-18 indicates wet conditions

Results for Investigation Area 1 delineation (September 19, 2016):

$$Y = 1(x1) + 2(x2) + 3(x3)$$
$$Y = 1(2) + 2(2) + 3(2)$$
$$Y = 11 = \text{normal hydrologic conditions}$$

Results for Investigation Area 2 delineation (November 16, 2016):

$$Y = 1(x1) + 2(x2) + 3(x3)$$
$$Y = 1(2) + 2(3) + 3(2)$$
$$Y = 14 = \text{normal hydrologic conditions}$$

Table 2. NRCS Mapped Soil Units within the Site.

Soil Symbol	Soil Name	Texture	Percent of Hydric Components	Drainage Class	Depth to Water Table	Frequency of Flooding and Ponding	Associated Sampling Plots	Percent of Project Area
G128A	Ferney-Cavour loams, 0 to 3 percent slopes	Loam over clay loam	15% - Partially hydric	Moderately well drained	36-60 inches	None; none	3-W	5.3%
G658B	Forman-Aastad loams, west, 3 to 6 percent slopes	Loam over clay loam	4% - Partially hydric	Well drained	>80 inches	None; none	1-U 1-W, 2-U, 2-W, 3-U, 4-U, 4-W, 5-U, 5-W	94.7%
							Total	**100%**

Table 3. Wetland Summary Table.

Wetland ID	Wetland Classification	Area (sq. ft.)	Area (acres)	Connectivity
Wetland 1	Wet Meadow	2,442.223	0.06	No observed connection
Wetland 2	Shallow Marsh	2,507.142	0.06	No observed connection
Wetland 3	Wet Meadow	1,614.822	0.04	Likely connects to an unnamed stream via culverts and other wetland outside of the project boundary, which is connected to Spring Creek
	Shallow Marsh	12,491.960	0.29	
Wetland 4A	Shallow Marsh	5,156.878	0.12	No observed connection
Wetland 4B	Shallow Marsh	5,218.992	0.12	No observed connection
Wetland 5	Wooded Swamp	6,286.200	0.14	No observed connection
	Total	**35,718.217**	**0.83**	

Appendix A

Wetland Determination Data Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 9/19/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 1-U

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 3

Subregion (LRR): F Lat: 48.021090626 Long: -100.885219842 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: Vegetation is mowed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Poa pratensis	60	Y	FACU
2. Taraxacum officinale	20	Y	FACU
3. Elymus repens	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 10	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is mowed.

SOIL

Sampling Point: 1-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-13	10YR 3/2	100					silt loam	dry; contains gravel
13-24	10YR 4/3	100					silt loam	dry, contains gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators are not present.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 9/19/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 1-W

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): F Lat: 48.021134969 Long: -100.885223764 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No _____ Hydric Soil Present? Yes X No _____ Wetland Hydrology Present? Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**

Remarks: Vegetation is mowed. Soil contains gravel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Amaranthus retroflexus	5	Y	FACU
2. Persicaria sagittata	10	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	15 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 75	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species 10	x 1 =	10
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species 5	x 4 =	20
UPL species _____	x 5 =	_____
Column Totals: 15 (A)		30 (B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

__ Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

__ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

__ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is mowed. *Amaranthus retroflexus* is an annual species, likely growing only after the area dried out. Prevalence index is less than 3 and wetland hydrology and hydric soils criteria are met.

SOIL

Sampling Point: 1-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	90	2.5YR 5/8	10	C	M	silt clay loam	dry; contains gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Refusal at 8 inches due to coarse fragments. Likely has been altered/disturbed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology met with the presence of more than 2 secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 9/19/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 2-U

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 5

Subregion (LRR): F Lat: 48.021536229 Long: -100.8854083630 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: Vegetation is mowed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Poa pratensis	60	Y	FACU
2. Taraxacum officinale	15	N	FACU
3. Elymus repens	10	N	FACU
4. Trifolium pratense	5	N	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 10	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is mowed.

SOIL

Sampling Point: 2-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 3/2	60					silt loam	dry; contains gravel, mixed matrix
	5YR 4/3	40					silt loam	dry, contains gravel, mixed matrix

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Refusal at 13 inches due to coarse fragments.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators are not present.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 9/19/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 2-W

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): F Lat: 48.021509072 Long: -100.883993876 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: Vegetation is mowed. Soil contains gravel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Typha angustifolia	5	Y	OBL
2. Phragmites australis	5	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 90	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is mowed. Much of ground is covered with dead vegetation.

SOIL

Sampling Point: 2-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/2	92	2.5YR 4/6	8	C	M	mucky loam	saturated; contains gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- X Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Refusal at 12 inches due to coarse fragments. Likely has been altered/disturbed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- X Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- X Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0.5

Water Table Present? Yes X No ____ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology met with the presence of multiple primary and secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 9/19/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 3-U

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 2

Subregion (LRR): F Lat: 48.022285540 Long: -100.88539441 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks: Vegetation is mowed.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Poa pratensis	40	Y	FACU
2. Taraxacum officinale	10	N	FACU
3. Elymus repens	30	Y	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 20	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation is mowed.

SOIL

Sampling Point: 3-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 3/2	100					silt loam	dry; contains gravel
4-7	10YR 4/4	100					silt loam	dry, contains gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Refusal at 7 inches due to coarse fragments.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators are not present.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 9/19/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 3-W

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): concave Slope (%): 1

Subregion (LRR): F Lat: 48.022334889 Long: -100.885473870 Datum: NAD1983

Soil Map Unit Name: G128A NWI classification: freshwater emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation X Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes _____ No X

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks: Portion of wetland is mowed. Soil contains gravel.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Eleocharis acicularis	40	Y	OBL
2. Typha angustifolia	20	Y	OBL
3. Elymus repens	10	N	FACU
4. Schoenoplectus tabernaemontani	5	N	OBL
5.			
6.			
7.			
8.			
9.			
10.			
	75 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 25	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

Portion of wetland is mowed.

SOIL

Sampling Point: 3-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 2/1	100					mucky loam	saturated; contains gravel
5-14	10YR 2/1	85	5YR 5/8	15	C	M	clay loam	saturated, contains gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

___ Histosol (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Stratified Layers (A5) **(LRR F)**
___ 1 cm Muck (A9) **(LRR F, G, H)**
___ Depleted Below Dark Surface (A11)
___ Thick Dark Surface (A12)
___ Sandy Mucky Mineral (S1)
___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
___ Sandy Gleyed Matrix (S4)
___ Sandy Redox (S5)
___ Stripped Matrix (S6)
X Loamy Mucky Mineral (F1)
___ Loamy Gleyed Matrix (F2)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

___ 1 cm Muck (A9) **(LRRI, J)**
___ Coast Prairie Redox (A16) **(LRR F, G, H)**
___ Dark Surface (S7) **(LRR G)**
___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
___ Reduced Vertic (F18)
___ Red Parent Material (TF2)
___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____
Depth (inches): _____

Hydric Soil Present? Yes X No ____

Remarks:

Refusal at 14 inches due to coarse fragments. Likely has been altered/disturbed.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

X Surface Water (A1)
X High Water Table (A2)
X Saturation (A3)
___ Water Marks (B1)
___ Sediment Deposits (B2)
___ Drift Deposits (B3)
X Algal Mat or Crust (B4)
___ Iron Deposits (B5)
___ Inundation Visible on Aerial Imagery (B7)
X Water-Stained Leaves (B9)
___ Salt Crust (B11)
___ Aquatic Invertebrates (B13)
___ Hydrogen Sulfide Odor (C1)
___ Dry-Season Water Table (C2)
___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
___ Presence of Reduced Iron (C4)
___ Thin Muck Surface (C7)
___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

___ Surface Soil Cracks (B6)
___ Sparsely Vegetated Concave Surface (B8)
___ Drainage Patterns (B10)
___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
___ Crayfish Burrows (C8)
___ Saturation Visible on Aerial Imagery (C9)
X Geomorphic Position (D2)
X FAC-Neutral Test (D5)
___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes X No ____ Depth (inches): 0.5
Water Table Present? Yes X No ____ Depth (inches): 0
Saturation Present? (includes capillary fringe) Yes X No ____ Depth (inches): 0

Wetland Hydrology Present? Yes X No ____

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology met with the presence of multiple primary and secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 11/16/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 4-U

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): F Lat: 48.02070453950 Long: -100.88482860956 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Poa pratensis	50	Y	FACU
2. Bromus inermis	30	Y	UPL
3. Cirsium arvense	10	N	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	90 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 10	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 0 (A)

Total Number of Dominant Species Across All Strata: 0 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 4-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					silt loam	dry; contains gravel
6-14	10YR 3/4	100					fine sandy loam	dry, contains gravel

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ____ No X

Remarks:

Refusal at 14 inches due to coarse fragments.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ____ No X Depth (inches): _____

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators are not present.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 11/16/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 4-W

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): F Lat: 48.02093379601 Long: -100.88442577211 Datum: NAD1983

Soil Map Unit Name: G128A NWI classification: freshwater emergent

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	20	Y	FAC
2.			
3.			
4.			
5.			
	20 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: _____)			
1. Typha angustifolia	60	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	60 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 40	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 4-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	7.5YR 3/2	80	10YR 5/1	10	D	M	silt clay loam	moist
			2.5YR 4/8	10	C	M		
6-9	7.5YR 3/2	75	10YR 5/1	20	D	M	clay loam	moist
			2.5YR 4/8	5	C	M		
9-20	5Y 5/2	77	10YR 5/1	20	D	M	clay loam	moist
			2.5YR 4/8	3	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- X FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): 0

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology met with the presence of one primary and 2 secondary indicators.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 11/16/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 5-U

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): F Lat: 48.02052274809 Long: -100.88436792490 Datum: NAD1983

Soil Map Unit Name: G658B NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes _____ No X	**Is the Sampled Area within a Wetland?** **Yes _____ No X**
Hydric Soil Present?	Yes _____ No X	
Wetland Hydrology Present?	Yes _____ No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	30	Y	FAC
2.			
3.			
4.			
5.			
	30 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: _____)			
1. Poa pratensis	30	Y	FACU
2. Bromus inermis	50	Y	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	80 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 20	= Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes _____ No X**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 5-U

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 2/2	100					silt loam	dry
6-14	10YR 4/4	100					silt loam	dry
14-20	10YR 5/4	100					fine sandy loam	dry

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes _____ No X Depth (inches): _____

Water Table Present? Yes _____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No X Depth (inches): _____

Wetland Hydrology Present? Yes _____ No X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology indicators are not present.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: GRE McHenry Substation City/County: McHenry County Sampling Date: 11/16/2016

Applicant/Owner: Great River Energy State: ND Sampling Point: 5-W

Investigator(s): L. Tekler Section, Township, Range: T152N, R80W, S2

Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): F Lat: 48.02039006300 Long: -100.88435215893 Datum: NAD1983

Soil Map Unit Name: G128A NWI classification: freshwater forested

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)

Are Vegetation _____ Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

Are Vegetation _____ Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X No _____	**Is the Sampled Area within a Wetland?** **Yes X No _____**
Hydric Soil Present?	Yes X No _____	
Wetland Hydrology Present?	Yes X No _____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	50	Y	FAC
2.			
3.			
4.			
5.			
	50 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. Salix eriocephala	15	Y	FACW
2.			
3.			
4.			
5.			
	15 = Total Cover		
Herb Stratum (Plot size: _____)			
1. Elymus repens	5	Y	FACU
2. Pos pratensis	5	Y	FACU
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	10 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
% Bare Ground in Herb Stratum 90	_____ = Total Cover		

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species 15	x 2 = 30
FAC species 50	x 3 = 150
FACU species 10	x 4 = 40
UPL species _____	x 5 = _____
Column Totals: 75 (A)	220 (B)

Prevalence Index = B/A = 2.93

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No _____**

Remarks: (Include photo numbers here or on a separate sheet.)

SOIL

Sampling Point: 5-W

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-3	10YR 2/2	95	10YR 5/8	5	C	M	silt loam	
3-12	10YR 2/2	70	10YR 6/1	10	D	M	silt loam	
			7.5YR 5/8	20	C	M		
12-20	10YR 4/3	60	10YR 6/1	20	D	M	fine sandy loam	
			10YR 5/8	20	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR F)**
- ___ 1 cm Muck (A9) **(LRR F, G, H)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ 2.5 cm Mucky Peat or Peat (S2) **(LRR G, H)**
- ___ 5 cm Mucky Peat or Peat (S3) **(LRR F)**
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ High Plains Depressions (F16) **(MLRA 72 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRRI, J)**
- ___ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ___ Dark Surface (S7) **(LRR G)**
- ___ High Plains Depressions (F16) **(LRRH outside of MLRA 72 & 73)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ___ Presence of Reduced Iron (C4)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ___ Surface Soil Cracks (B6)
- X Sparsely Vegetated Concave Surface (B8)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- X Geomorphic Position (D2)
- ___ FAC-Neutral Test (D5)
- ___ Frost-Heave Hummocks (D7) **(LRR F)**

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland hydrology met with the presence of one primary and 2 secondary indicators.

Appendix B

Site Photographs

Appendix B: Photo Log Of Wetland Delineation.



Photo 1: Wetland 1, facing east.



Photo 2: Sample plot 1-W, within wetland 1, facing north.

Appendix B: Photo Log Of Wetland Delineation.



Photo 3: Sample plot 1-U, near wetland 1, facing east.



Photo 4: Wetland 2, facing north.

Appendix B: Photo Log Of Wetland Delineation.



Photo 5: Sample plot 2-W, within wetland 2, facing south.



Photo 6: Sample plot 2-U, near wetland 2, facing north.

Appendix B: Photo Log Of Wetland Delineation.



Photo 7: Wetland 3, facing west.



Photo 8: Wetland 3, facing northwest.

Appendix B: Photo Log Of Wetland Delineation.



Photo 9: Wetland 3, facing north.



Photo 10: Wetland 3, facing northeast.

Appendix B: Photo Log Of Wetland Delineation.



Photo 11: Sample plot 3-W, within wetland 3, facing north.



Photo 12: Sample plot 3-U, near wetland 3, facing east.

Appendix B: Photo Log Of Wetland Delineation.



Photo 13: Upland swale in the NE corner of the investigation area, facing west.



Photo 14: Upland swale in the SW corner of the investigation area, facing north.

Appendix B: Photo Log Of Wetland Delineation.



Photo 15: Upland within the investigation area, facing north.



Photo 16: Upland within the investigation area, facing north.

Appendix B: Photo Log Of Wetland Delineation.



Photo 17: Upland within the investigation area, facing south.



Photo 18: Upland within the investigation area, facing west.

Appendix B: Photo Log Of Wetland Delineation.



Photo 19: Wetland 4A, facing east.



Photo 20: Sample plot 4-W, within wetland 4A, facing north.

Appendix B: Photo Log Of Wetland Delineation.



Photo 21: Sampling plot 4-U, near wetlands 4A and 4B, facing east.



Photo 22: Upland berm between wetlands 4A and 4B, facing east.

Appendix B: Photo Log Of Wetland Delineation.



Photo 23: Wetland 4B, facing southeast.



Photo 24: Wetland 5, facing southeast.

Appendix B: Photo Log Of Wetland Delineation.



Photo 25: Sampling plot 5-W, within wetland 5, facing east.



Photo 26: Upland within investigation area, facing south.

Appendix B: Photo Log Of Wetland Delineation.



Photo 27: Upland within investigation area, facing north.

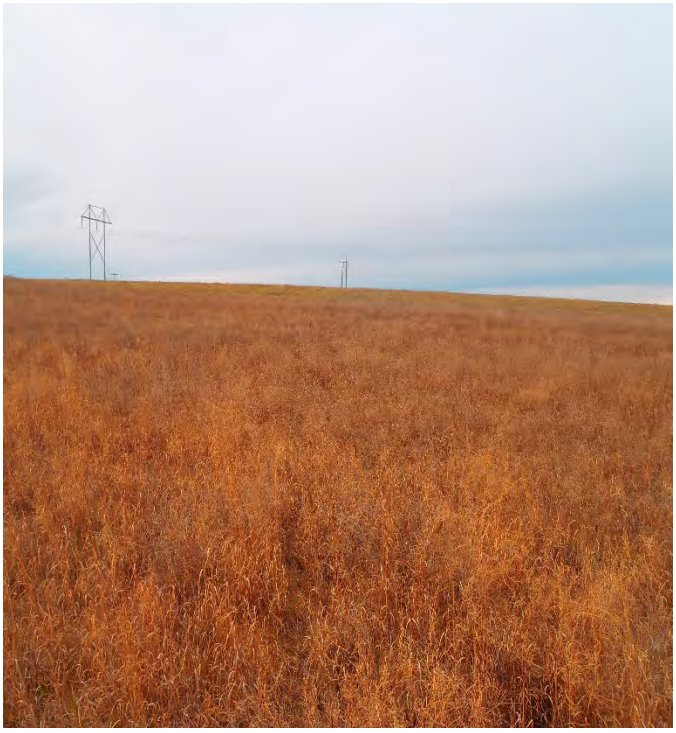


Photo 28: Upland within investigation area, facing west.

Appendix E Raptor Nest Survey and Habitat Report and North Prairie Township Supplement

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AECOM

Submitted to
Xcel Energy
414 Nicollet Mall, 414-6A
Minneapolis, MN 55401

Submitted by
AECOM
1000 East Calgary Avenue, Suite 1
Bismarck, ND 58503
November 10, 2016

Raptor and Habitat Survey Report for the Magic City Substation to McHenry Substation 230 kV Transmission Line Project

Xcel Energy

Ward and McHenry Counties, North Dakota

EXECUTIVE SUMMARY

Xcel Energy (Xcel) proposes to design, construct, and operate the Magic City Substation to McHenry Substation 230kV Transmission Line Project (Minot Load Serving Project or Project) in Ward and McHenry Counties, North Dakota. The Project would consist of constructing a new substation and an approximately 20-mile-long 230 kV transmission line from a new Magic City substation in Ward County to an existing McHenry Substation in McHenry County. Xcel intends to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed, the existing 115 kV line would be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. Xcel contracted AECOM to conduct a raptor and raptor nest survey as well as a threatened and endangered species (T&E) habitat survey, concentrating on Dakota skipper (*Hesperia dacotae)* habitat, within the Project area.

Two AECOM biologists (Lindsey Meyers, PhD, and Ryan King) conducted a field survey of the Project area on August 30, 2016. Raptor species were identified on the basis of audio and/or visual detection. Nest types were identified by occupancy and raptor species within a close proximity. Observations were made utilizing Vortex 10 X 42 binoculars. Raptor Observation/Nest Survey data sheets were used to record the descriptions of the nest habitats and raptors observed. Locations of raptors and nests were recorded on printed field maps. Additionally, AECOM previously completed a desktop analysis mapping potential Dakota skipper habitat. AECOM's habitat field survey was concentrated on these areas while expanding the survey area to previously unmapped native grasslands transected by the Project.

Of the approximately 20 miles surveyed, six raptors and five nests were observed. Two Swainson's hawks (*Buteo swainsoni*) and four red-tailed hawks (*Buteo jamaicensis*) were observed during the survey. Additionally, two eagle nests and four other raptor nests were identified during the survey, one of which was occupied by two red-tailed hawks.

A total of nine areas were surveyed for potential Dakota skipper habitat. Three were given a moderate quality remnant prairie determination and six were given a low quality remnant prairie determination. The moderate quality prairie had some native plant species, including purple coneflower, but also had invasive species and disturbances adjacent to the area. The low quality prairie consisted mostly of invasive plant species and included a high number of disturbances including gravel pits, railroads, gravel roads, and excessive grazing by cattle. Although areas of low and moderate quality remnant prairie were observed during the survey, they do not exhibit the characteristics and plant species diversity necessary to be classified as Dakota skipper habitat. It is important to note that Dakota skipper presence and absence surveys were not conducted to identify individual butterflies. However, based on the habitat present, this Project is not likely to affect the Dakota skipper or impact Dakota skipper habitat.

STATEMENT OF LIMITATIONS

This report was prepared by the staff of AECOM under the supervision of experienced professionals. The data interpretation, conclusions, and recommendations presented in the report were governed by AECOM's experience and professional judgment. This report has been prepared based on data current at the time of preparation. Assumptions based on this data, although believed reasonable and appropriate based on the data provided herein, may not prove to be true in the future as new data are collected. The conclusions and recommendations of AECOM are conditioned upon these assumptions.

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Appendix D Photographic Log

1.0 INTRODUCTION

Xcel Energy (Xcel) proposes to design, construct, and operate the Magic City Substation to McHenry Substation 230kV Transmission Line Project (Minot Load Serving Project or Project) in Ward and McHenry Counties, North Dakota. The Project would consist of constructing a new substation and an approximately 20-mile long 230 kV transmission line from a new Magic City substation in Ward County to an existing McHenry Substation in McHenry County. Xcel's intends to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission has been constructed, the existing 115 kV line would be moved onto the new 230 kV structures (double circuit structures) and the existing 115 kV line would be removed. **Figure 1-1** displays the proposed Project area. Xcel contracted AECOM to conduct a raptor and raptor nest survey, as well as a threatened and endangered species (T&E) habitat survey concentrating on Dakota skipper (*Hesperia dacotae)* habitat within the Project area.

The proposed 50-acre Magic City Substation site and the 20-mile-long transmission line are located entirely within the Northern Glaciated Plains Ecoregion (Bryce et al. 1998). This sub humid ecoregion was largely affected by glaciation with a thick mantel of glacial till and contains a level to gently rolling landscape with numerous temporary and seasonal wetlands. Agriculture in the area consists predominantly of small grains, with durum wheat being the major crop. Barley, sunflowers, and alfalfa are also common. Due to the level topography and fertile soil, many of the ecoregion's wetlands have been drained and converted to cropland. The Project crosses multiple wetlands, two unnamed streams, and the Souris River.

2.0 REGULATORY FRAMEWORK

2.1 Birds

The Migratory Bird Treaty Act of 1918 makes it illegal to pursue, hunt, take, attempt to take, kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried any migratory bird (USFWS 2015b). This includes any part, nest, or egg of any such bird. Eagles are under this same protection as well as being protected through the Bald and Golden Eagle Protection Act. In 2007, the bald eagle was removed from the USFWS's T&E list but still requires post-delisting monitoring to ensure recovery (USFWS 2015a). The golden eagle is not a federally listed species.

Adult bald eagles (*Haliaeetus leucocephalus* generally live near rivers, lakes, and wetlands surrounded by mature tree stands. Bald eagles build large nests, preferring tall, live trees and are usually used and enlarged each year. The North Dakota Game and Fish (NDGF) Department has labeled the Souris River, which is within the Project area, as a key nesting area for bald eagles (Dyke et al. 2015).

Golden eagles (*Aquila chrysaetos*) are overall dark brown with feathery legs, brown eyes, and a black beak (Dyke et al. 2015). Unlike bald eagles, golden eagles will avoid heavily forested areas and prefer to live near open shrub land and grasslands of shortgrass and mixed prairies. Golden eagles will typically build nests on cliffs, but will also nest in large trees such as cottonwood or green ash. Often associated with prairie dog towns, golden eagles will reuse nest locations year after year.

2.2 Threatened and Endangered Species

The United States Fish and Wildlife Service (USFWS) has legislative authority to list and monitor the status of species whose populations are considered to be imperiled. This federal legislative authority for the protection of T&E species issues from the Endangered Species Act (ESA) of 1973, and its subsequent amendments. Regulations supporting this Act are codified and regularly updated in Title 50 CFR Sections 17.11 and 17.12. The federal process stratifies potential candidates based upon the species' biological vulnerability. Species listed as endangered or threatened by the federal government are provided full protection under the law. This protection not only prohibits the direct possession (take) of a protected species, but also includes a prohibition of indirect take, such as destruction of designated critical habitat. The ESA and accompanying regulations provide the necessary authority and incentive for individual states to establish their own regulatory vehicle for the management and protection of threatened and endangered species.

North Dakota does not have a state T&E species list; however, the NDGF does list Species of Conservation Priority, which are ranked into three priority levels (NDGF 2015). The bald eagle and golden eagle are both listed as having a Level 2 conservation priority, meaning it is a species that has a moderate level of conservation priority or a high level of conservation priority with available non-State Wildlife Grant funding.

Representatives from Xcel and AECOM met with USFWS North Dakota Field Office staff in Bismarck on June 15, 2015 to discuss the Project and to obtain input regarding potential impacts to protected species. AECOM generated an official species list **(Table 2-1)** from the USFWS Information for Planning and Conservation (IPaC) website that was reviewed at the meeting to identify protected species having the potential to occur within the Project area (**Appendix A**). According to the USFWS, the Project area has the potential to contain suitable habitat for, or has known occurrences of six federally-listed threatened or endangered species. These species include the endangered whooping crane (*Grus Americana*), endangered gray wolf (*Canis lupus*), threatened piping plover (*Charadrius melodus*), threatened Dakota skipper (*Hesperia dacotae*), threatened rufa red knot (*Calidris canutus rufa*), and threatened northern

long-eared bat (*Myotis septentrionalis*). One candidate species, Sprague's pipit (*Anthus spragueii*), also has the potential to occur within the Project area. However, due to its status as a candidate species, the USFWS commented in the meeting on June 15, 2016 that it did not need to be included in this analysis.

It was noted at the meeting that the Project is located outside of the white nose syndrome zone for the northern long-eared bat, and therefore under the 4(d) ruling there are no restrictions on incidental take of the species within the Project area. It was also noted that while gray wolves have been observed in Ward and McHenry Counties, they are habitat generalists and are unlikely to be impacted by the Project. The USFWS recommended that any required clearing and mowing in the Project area occur outside of the migratory bird nesting season to avoid impacts to nesting birds, and recommended that bird diverters be used along the transmission line to minimize impacts to whooping cranes. Finally, Xcel described the desktop review that AECOM had completed to identify potential Dakota skipper habitat, and that a reconnaissance level habitat review of the 300-foot-wide Project Corridor and preliminarily identified access routes would be completed. As a result of this discussion, it was determined that the only protected species requiring a habitat level assessment was the Dakota skipper.

Table 2-1. Federally Listed Species with Potential to Occur in the Project Area

Species	Status[1]	Habitat	Potential for Occurrence
Dakota skipper *Hesperia dacotae*	FT	Known to occur in upland native prairie habitat with high abundance of wildflowers, high species diversity, and minimal human disturbance.	No critical habitat within the Project area. Field surveys of potential habitat determined that no suitable habitat exists within the Project Corridor.
Piping plover *Charadrius melodus*	FT	In North Dakota, breeding and nesting sites for the piping plover can be found along the Missouri River system. The spring/summer reproductive season for the piping plover runs from mid-April through August. Preferred habitat includes riverine sandbars, gravel beaches, alkali areas of wetlands, and flat sandy beaches with little vegetation. The USFWS has identified critical habitat for the piping plover on the Missouri River system.	No critical habitat within the Project Corridor. As with other migratory birds, if tree clearing and mowing near large waterbodies is to occur during nesting season, a biologist will review the corridor five days before construction and flag any nests to be avoided. In addition, Xcel will install bird diverters along the entire length of the transmission line Project to reduce the potential for impacts to piping plovers.
Red knot *Calidris canutus rufa*	FT	The red knot, although rare in the Northern Great Plains, is known to use shoreline/marsh habitat as stopover habitat during its migration. Sightings in North Dakota typically occur in mid-May and mid-September.	Construction is planned for fall and winter when Red knots may be migrating through the North Dakota. Red knots do not nest in North Dakota, therefore impacts associated with construction of the Project are not anticipated. In addition, Xcel will install bird diverters along the entire length of the transmission line Project to reduce the potential for impacts to red knots.
Whooping crane *Grus americana*	FE	Whooping cranes migrate through North Dakota along a band running from the south-central to the northwest portions of	No critical habitat within the Project Corridor.

Species	Status[1]	Habitat	Potential for Occurrence
		the state. The birds use shallow, seasonally and semi-permanently flooded palustrine (marshy) wetlands for roosting, and various cropland and emergent wetlands for feeding. During migration, whooping cranes are often observed in riverine habitats, including the Missouri River. Typically, whooping cranes from the Aransas-Wood Buffalo flock, known to migrate through North Dakota, begin migrating north from their wintering grounds in Texas in late March. By early May, the majority of the migrating population will arrive at their nesting grounds in Wood Buffalo National Park in Alberta and Northwest Territories, Canada. Autumn migration typically begins in mid-September with the majority of the flock arriving back at the wintering grounds by late-October to mid-November.	Palustrine emergent wetlands are present within the Project area. According to a map of North Dakota's whooping crane migration corridor produced by the USFWS, the Project area is located within the whooping crane central flyway where 75 percent of confirmed sightings have occurred. However, Xcel will install bird diverters along the entire length of the transmission line Project to reduce the potential for impacts to whooping cranes.
Gray wolf *Canis lupus*	FE	Preferred habitat includes biomes such as boreal forest, temperate deciduous forest, and temperate grassland. Likely habitat for the gray wolf in North Dakota is the forested areas in north central and northeast parts of the state.	No suitable habitat in the Project area.
Northern long-eared bat *Myotis septentrionalis*	FT	The northern long-eared bat is primarily an eastern US species, but it does occur in North Dakota. Northern long-eared bats spend winter hibernating in caves and during the summer the bats roost singly or in colonies underneath bark, in cavities or crevices of both live and dead trees.	The Project is located outside of the white nose syndrome zone for the Northern long-eared bat, and therefore under the 4(d) ruling there are no restrictions related to the Project area.

[1] FE = federally endangered; FT = federally threatened

Source: USFWS Official Species List dated December 17, 2015. Consultation Code: 06E15000-2016-SLI-0016

2.3 Dakota Skipper Habitat

Dakota skippers are small butterflies with a one-inch wing span (NDGF 2015). Like other skippers, it has a thicker body and faster and more powerful flight than most butterflies. The upper sides of the wings are a tawny-orange to brown with a darker mark on the forewing. The lower surface of the wing is a pale yellow color. Dakota skippers occur in two general habitat types. The first (Type A) is a low wet-mesic prairie with little topographic relief that occurs on near-shore glacial lake deposits. Common plant species in Type A habitat include wood lily (*Lilium philadelphicum*), harebell (*Campanula rotundifolia*), and smooth camas (*Zygadenus elegans*). The second habitat type (Type B) occurs on rolling terrain over gravelly glacial moraine deposits and is dominated by bluestem grasses, needlegrasses, and purple coneflower (*Echinacea angustifolia*) (USFWS 2016a). The Dakota skipper is listed as having a Level 2 conservation priority by the NDGF.

On October 23, 2014, the USFWS listed the Dakota skipper as threatened under the ESA (USFWS 2014). In addition, a 4(d) rule was established for the Dakota skipper to build cooperative partnerships with private livestock producers who are important to the conservation and recovery of the Dakota skipper. The rule exempts incidental take of Dakota skippers from the following activities on federal lands: fence construction and maintenance; livestock gathering such as the installation of corrals; development of livestock watering facilities; noxious weed control; haying native haylands after July 15th; mowing section lines; and, livestock grazing.

Critical habitat has been federally designated for this species in North Dakota. This habitat includes two locations northeast of Watford City in McKenzie County, ten locations east of Minot in McHenry County, one location near Dunseith in Rolette County, and three locations west of Wahpeton in Ransom and Richland Counties. No critical habitat is located within the Project area.

3.0 FIELD SURVEYS

3.1 Methods

Two AECOM biologists (Lindsey Meyers, PhD, and Ryan King) conducted a field survey of the Project area on August 30, 2016. County roads and section-line two track trails were utilized to evaluate the Project area. An approximate one mile buffer on either side of the transmission line was surveyed for raptors and raptor nests. Typically, the perimeter of each section was accessible allowing the biologists to evaluate each square mile. When vehicle access was unobtainable, preliminarily-identified access routes were walked. Raptor species were identified on the basis of audio and/or visual detection. Nest types were identified by occupancy and raptor species within a close proximity. Observations were made with the aid of binoculars. Raptor Observation/Nest Survey data sheets were used to record the descriptions of the nest habitats and raptors observed (**Appendix B**). Locations of raptors and nests were recorded on printed field maps. **Figure 2-1** displays recorded raptors and nest locations. Only sheet maps with identified nests are included.

AECOM previously completed a desktop analysis mapping potential Dakota skipper habitat. AECOM's field survey team reviewed the previous desktop analysis and current literature on the Dakota skipper, particularly in regards to the habitat needs and characteristics, and conducted a one day on-site field survey concentrated on the areas identified during the desktop analysis. AECOM also expanded the field survey to areas transected by the Project that were previously unmapped during the desktop analysis but exhibited native grassland characteristics. Permission to access native grasslands was granted for most of the Project area. AECOM biologists accessed these areas by foot to record plant species and quality of the habitat. Where permission was not granted, the parcels were observed from the closest road.

Sensitive Habitat Survey data sheets were used to record the quality of each habitat area (**Appendix C**). Community and land use type, T&E species observed, dominant plant species, wildlife communities observed within the vicinity, and site disturbances were the parameters used when evaluating the habitat quality. A high, moderate, or low ranking was given to each area. Emphasis was given on identifying key Dakota skipper plant species during the survey. Introduced species directly adjacent to roadside ditches and section lines were not considered while evaluating the prairies. High quality habitat was defined as areas that were not or were only lightly grazed by livestock and mostly consisted of Dakota skipper preferred plants. Moderate quality habitat was defined as areas that had light to moderate grazing and had some Dakota skipper preferred plants. Low quality habitat was defined as areas that were heavily grazed and did not have Dakota skipper preferred plants.

3.2 Results

Of the approximately 20 miles surveyed, six raptors and five nests were observed. Two Swainson's hawks (*Buteo swainsoni*) and four red-tailed hawks (*Buteo jamaicensis*) were observed during the survey. The nests observed included two eagle nests, one red-tailed hawk nest, and two other raptor nests. The nest locations are shown on **Figure 2-1**. Photographs are included in **Appendix D.** Nest 5 (eagle nest) is located approximately 700 feet southwest of the Project centerline and occurs in the wooded floodplain along the Souris River. Nest 1 (eagle nest) is located approximately 2,200 feet southwest of the Project centerline in a tree row overlooking a wetland area. Both nests occur within one-half mile of the Project area. The existing trees along the Souris River may provide sufficient screening for Nest 5 that would minimize any impacts caused by construction to nesting eagles. Additionally, Nest 1 is likely far enough away from the Project area that a sufficient distance buffer exists that would also minimize impacts. Further, construction activities that occur after the nesting season for bald eagles (September or later) would greatly reduce the risk of disturbance. Nests 2 and 3 occur within or near the Project right-of-way. Nest 2 is a stick nest (unknown species) occurring within a tree in a wetland. Nest 3

is a stick nest (red tailed hawk). If construction at these locations is to occur during the nesting season, it is recommended that a biologist review the nests five days before initiation of construction activities. If the nests are active, construction should be avoided in that area until the young birds have fledged.

A total of nine habitats were surveyed for potential Dakota skipper habitat. Three were given a moderate quality remnant prairie determination and six were given a low quality remnant prairie determination. The moderate quality prairie had some native plant species, including purple coneflower, but also had invasive species and disturbances adjacent to the area. The low quality prairie was mostly made up of invasive species and included a high number of disturbances including gravel pits, railroads, gravel roads, and cattle. **Figure 2-2** displays the habitats surveyed. Only sheet maps with surveyed habitats are included.

3.3 Conclusion

Two eagle nests occur within one-half mile of the Project centerline. However, sufficient screening and distance buffers occur that would minimize disturbance to nesting eagles. Further, construction activities that occur after the nesting season for bald eagles (September or later) would greatly reduce the risk of disturbance.

Additionally, two elevated stick nests occur within or near the project right-of-way. If construction at these locations is to occur during the nesting season, it is recommended that a biologist review the nests five days before initiation of construction activities. If the nests are active, construction should be avoided in that area until the young birds have fledged.

Although areas of low and moderate quality remnant prairie were observed, they do not exhibit the characteristics and plant species diversity necessary to be classified as Dakota skipper habitat. It is important to note that Dakota skipper presence and absence surveys were not conducted to identify individual butterflies. However, based on the habitat present, this Project is not likely to affect the Dakota skipper or impact Dakota skipper habitat.

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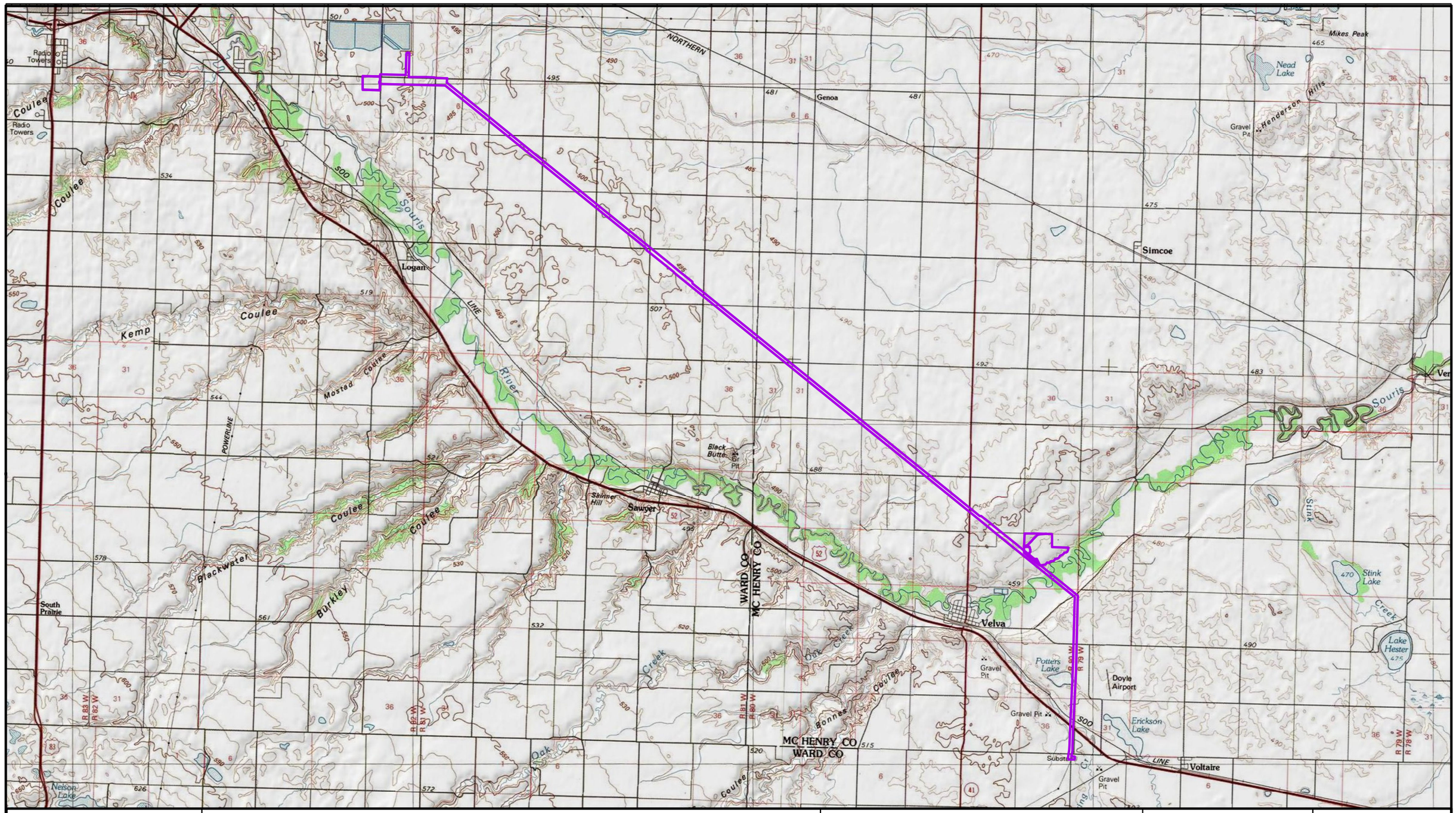
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Figures



Legend

Project Area

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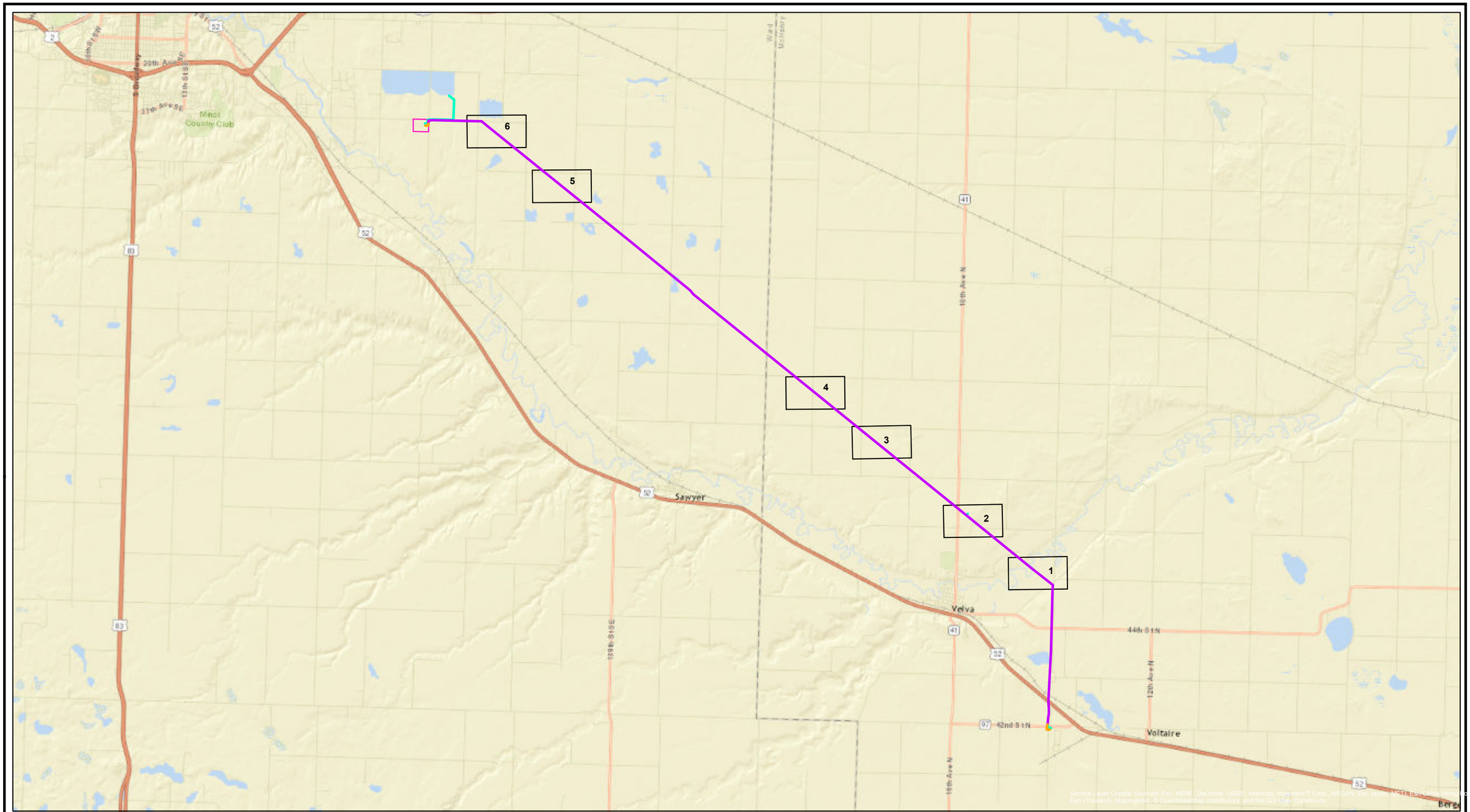
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Figure 1-1 Project Area
Biological Survey
Ward and McHenry Counties,
North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	1-1



Legend

Project Feature

- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Proposed Magic City Substation

Sheet Map Index

- Sheet Map Index

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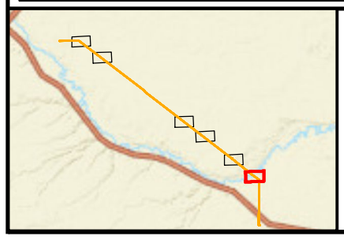
Magic City to McHenry 230kV Project Raptor and Raptor Nest Locations Map Ward and McHenry Counties, North Dakota

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PROJECT NUMBER	60342328
FIGURE NUMBER	2-1

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0924-038
0924-037
0924-036
Nest 5
Red-Tailed Hawk
0924-035
0924-034
0924-033
0924-032
0924-031



Raptor Survey
- Nest Locations
- Raptor Sighting

Project Feature
- Preliminary Structure Location
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Raptor and Raptor Nest Locations Map
Ward and McHenry Counties, North Dakota

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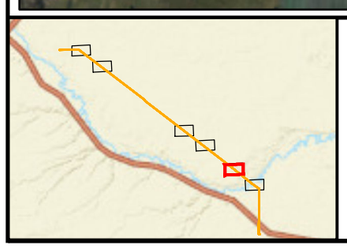
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0924-053
0924-052
0924-051
0924-050
0924-049
0924-048
0924-047
0924-046
0924-045
Red-Tailed Hawk



Raptor Survey
- Nest Locations
- Raptor Sighting

Project Feature
- Preliminary Structure Location
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Raptor and Raptor Nest Locations Map
Ward and McHenry Counties, North Dakota

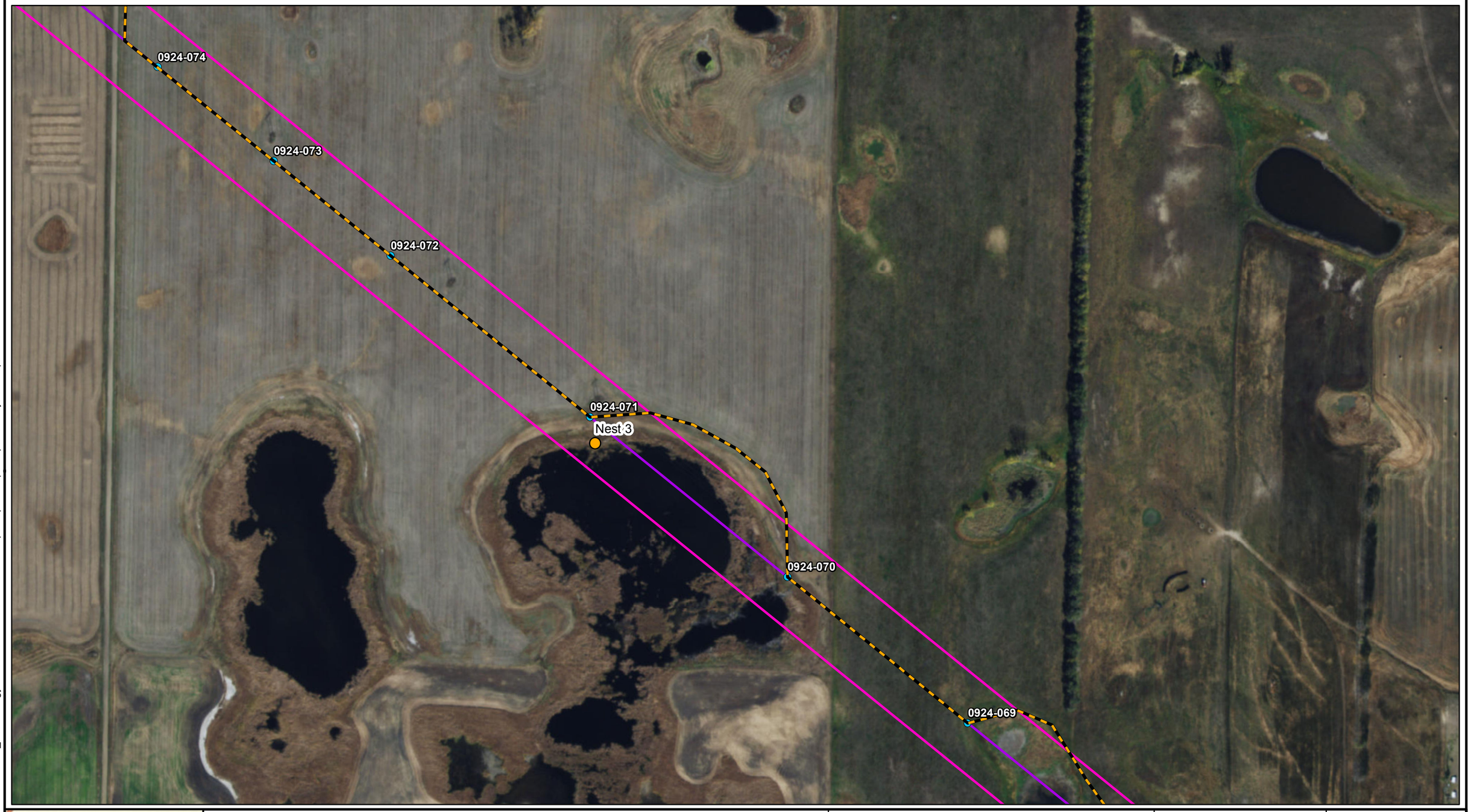
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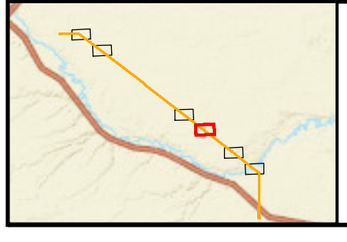
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Raptor Survey
- Nest Locations
- Raptor Sighting

Project Feature
- Preliminary Structure Location
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Raptor and Raptor Nest Locations Map
Ward and McHenry Counties, North Dakota

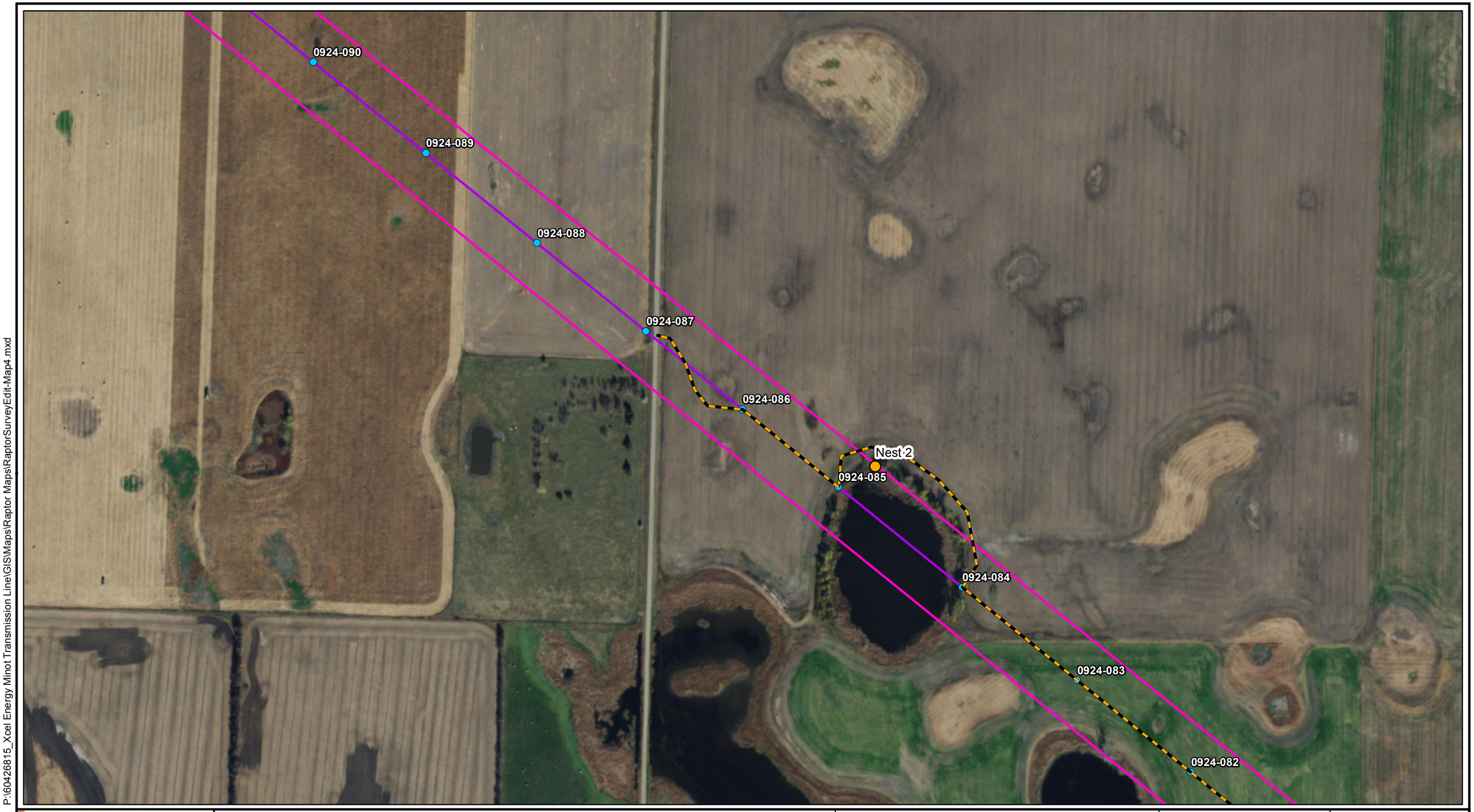
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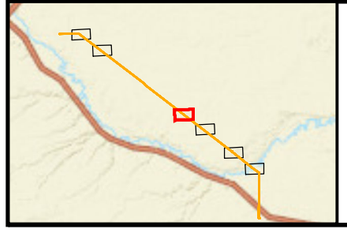
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Raptor Survey
- Nest Locations
- Raptor Sighting

Project Feature
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- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Raptor and Raptor Nest Locations Map
Ward and McHenry Counties, North Dakota

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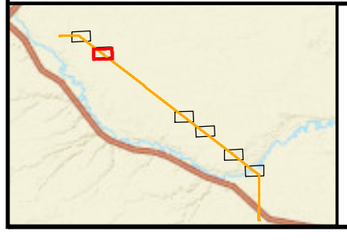
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0924-155
0924-154
0924-153
0924-152
0924-151
0924-150
0924-149
Swainson's Hawk
0924-148



Raptor Survey
- Nest Locations
- Raptor Sighting

Project Feature
- Preliminary Structure Location
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
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Magic City to McHenry 230kV Project
Raptor and Raptor Nest Locations Map
Ward and McHenry Counties, North Dakota

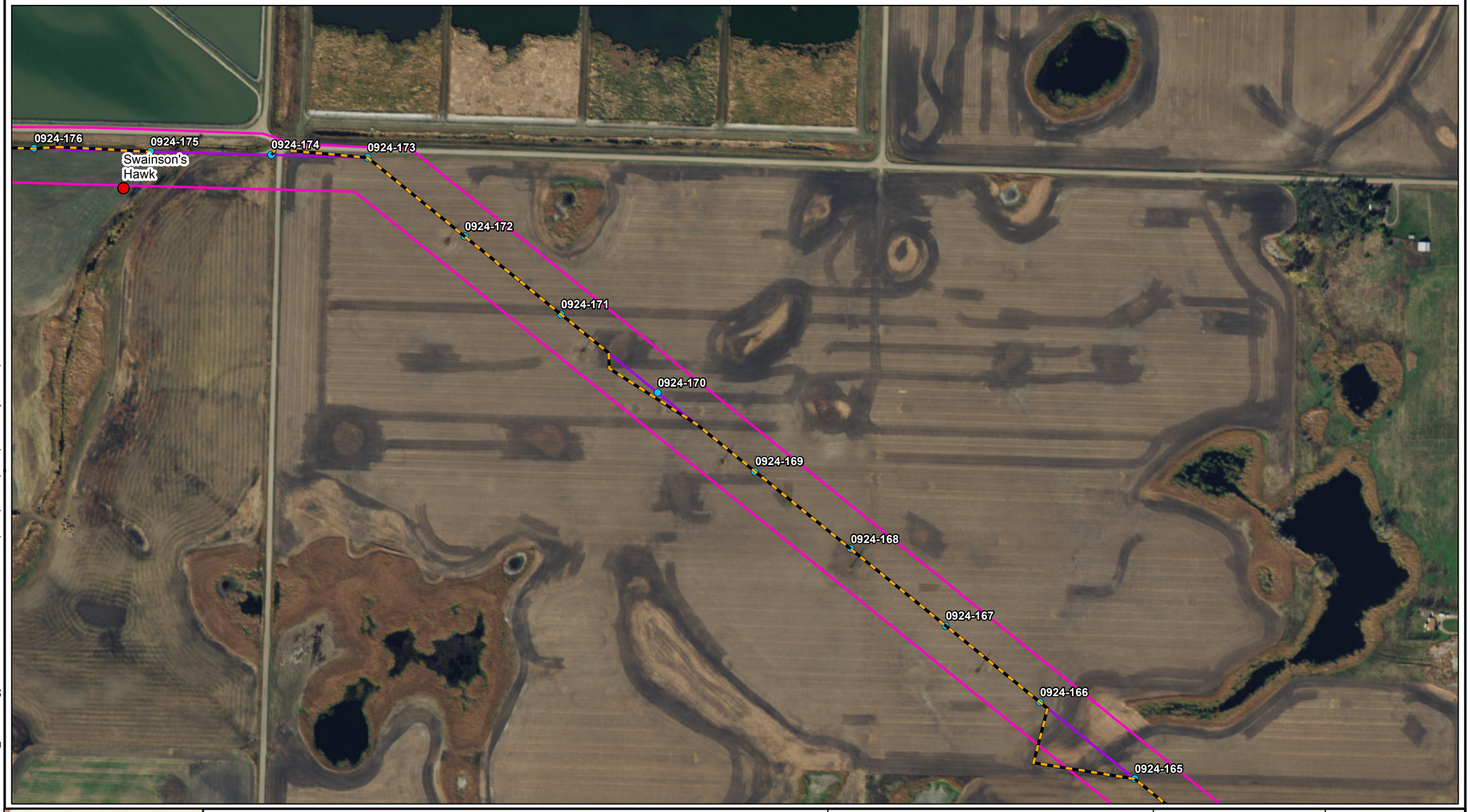
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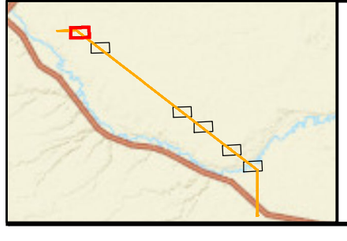
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MAP NUMBER	5





Raptor Survey
- Nest Locations
- Raptor Sighting

Project Feature
- Preliminary Structure Location
- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Raptor and Raptor Nest Locations Map
Ward and McHenry Counties, North Dakota

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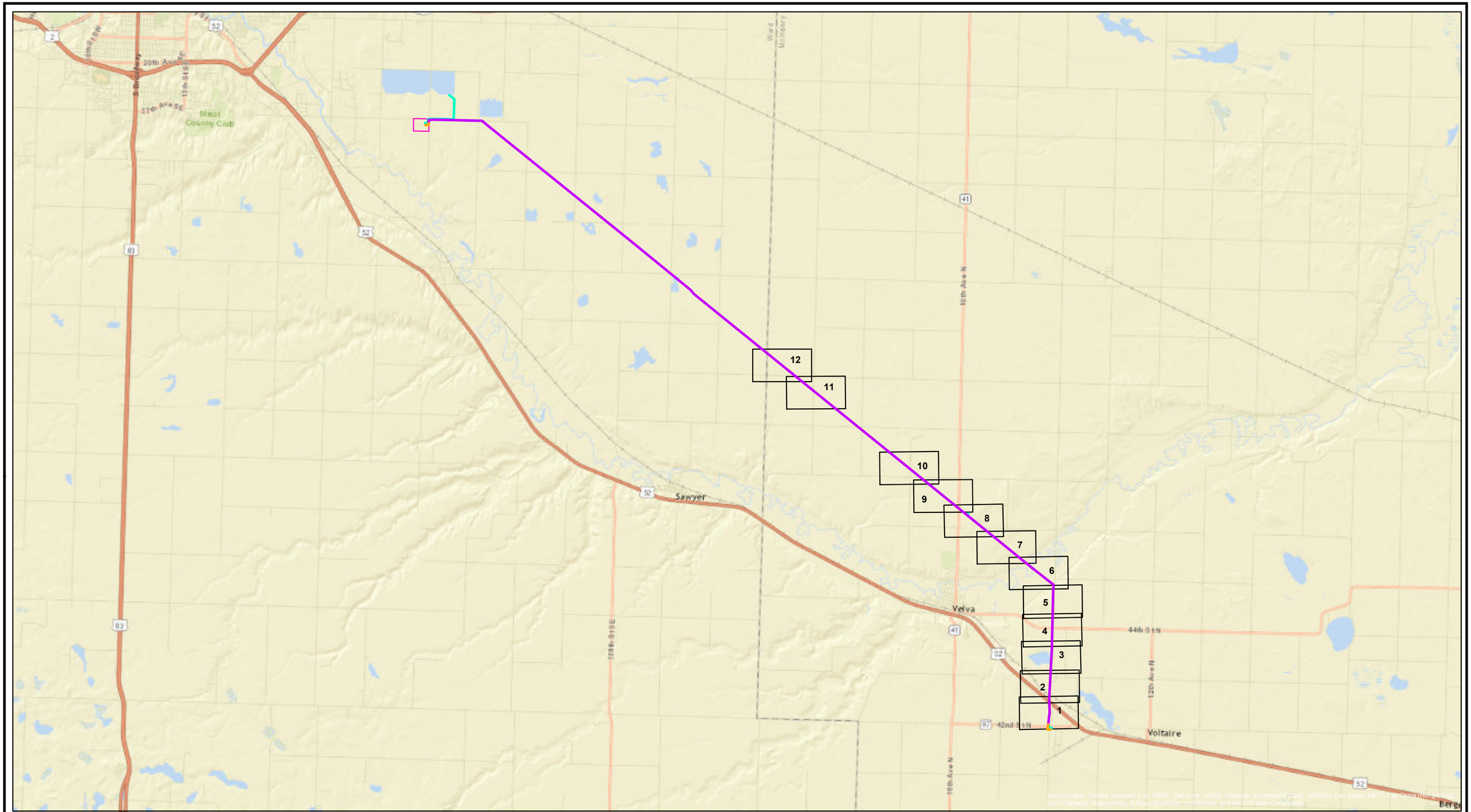
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Legend

Project Feature

- Preliminary 115 kV Centerline
- Preliminary 230 kV Centerline
- Preliminary 230/115 kV Centerline
- Proposed Magic City Substation

Sheet Map Index

- Sheet Map Index

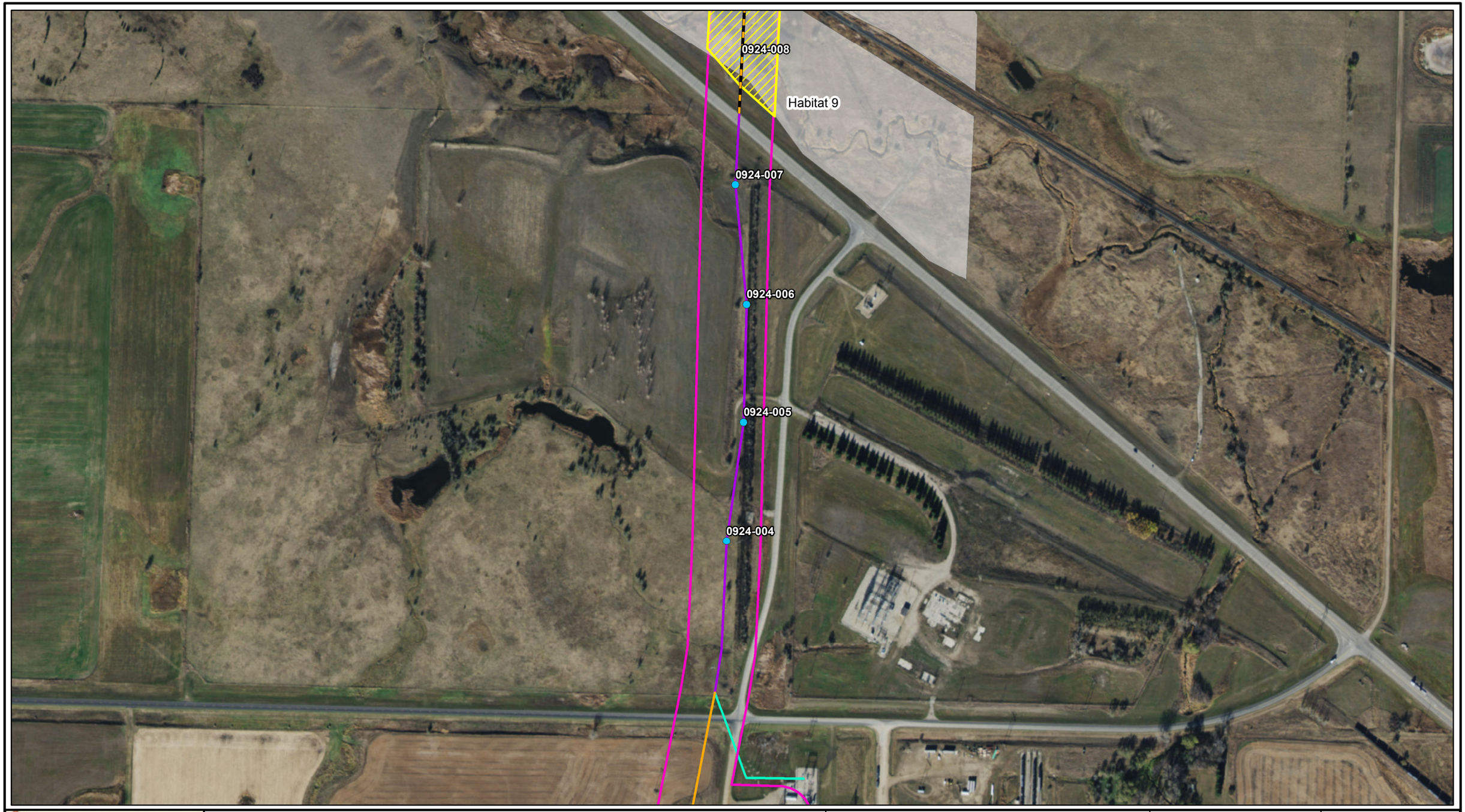
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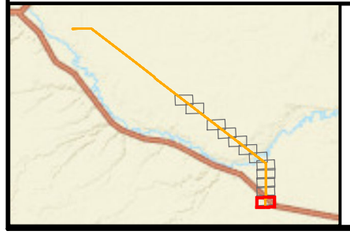
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Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

AECOM
1000 East Calgary Ave.
Suite 1
Bismarck, ND. 5850
www.aecom.com

Drawn:	MMM 10/03/2016
Approved:	JDC 10/03/2016
Scale:	1:118,000
PROJECT NUMBER	60342328
FIGURE NUMBER	2-2





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat

Identified via Desktop Analysis

Habitat Condition Identified in the Field

Moderate

Low

Project Feature

Preliminary Structure Location

Preliminary 115 kV Centerline

Preliminary 230 kV Centerline

Preliminary 230/115 kV Centerline

Survey Corridor

Access Route

Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

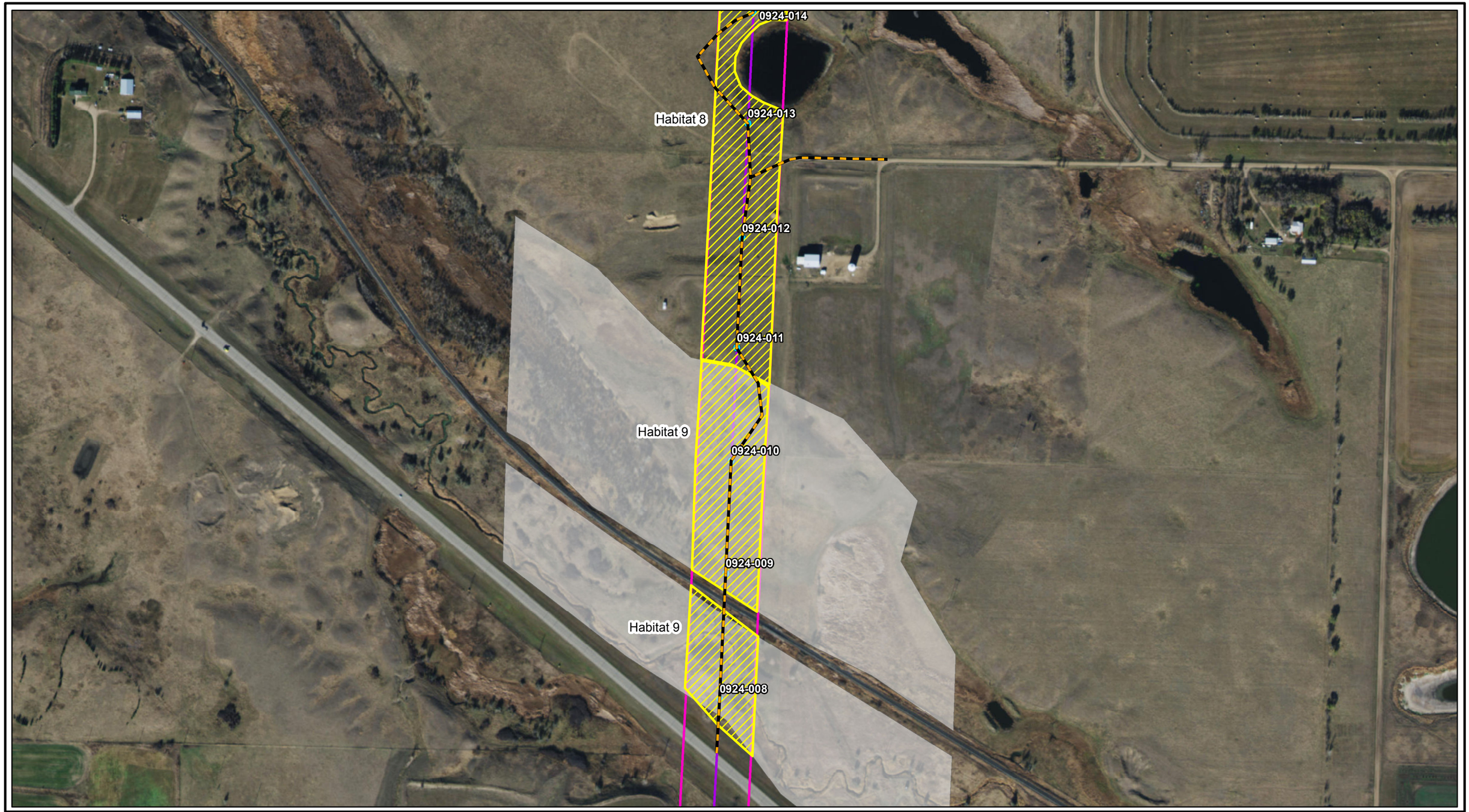
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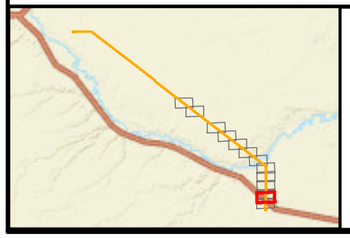
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	1





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 230/115 kV Centerline

- Survey Corridor

Access Route
- Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

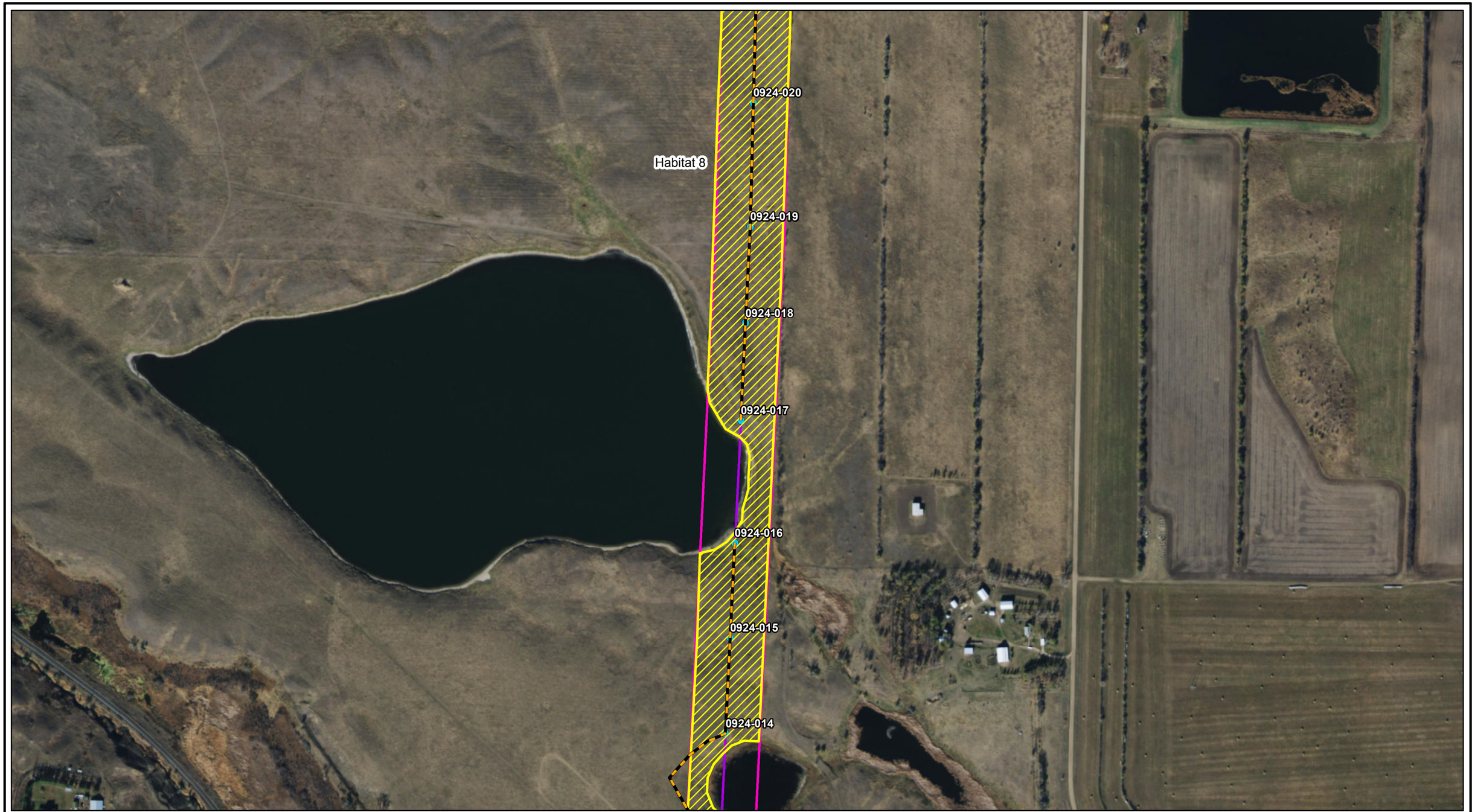
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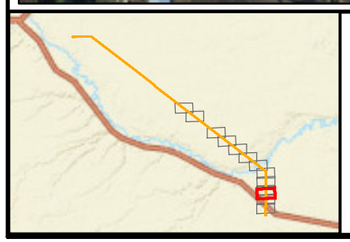
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	2





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat

Identified via Desktop Analysis

Habitat Condition Identified in the Field

Moderate

Low

Project Feature

Preliminary Structure Location

Preliminary 230/115 kV Centerline

Survey Corridor

Access Route

Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

N

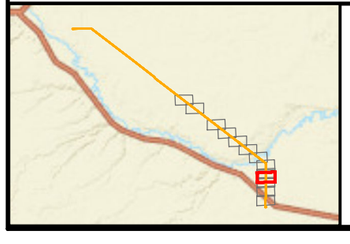
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	3





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat

Identified via Desktop Analysis

Habitat Condition Identified in the Field

Moderate

Low

Project Feature

Preliminary Structure Location

Preliminary 230/115 kV Centerline

Survey Corridor

Access Route

Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

N

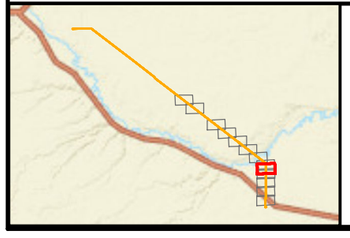
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	4





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access

Magic City to McHenry 230kV Project Potential Dakota Skipper Habitat Map Ward and McHenry Counties, North Dakota

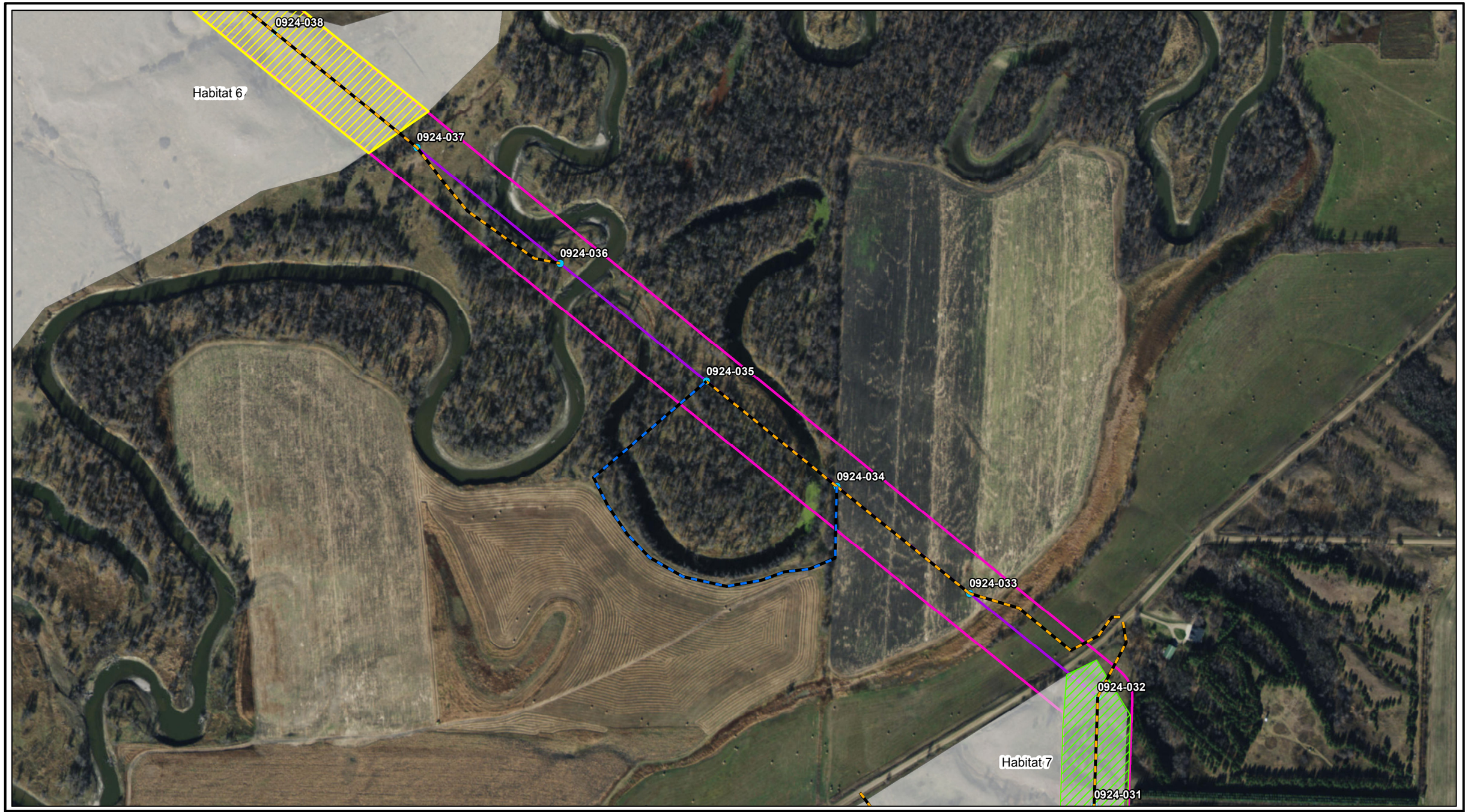
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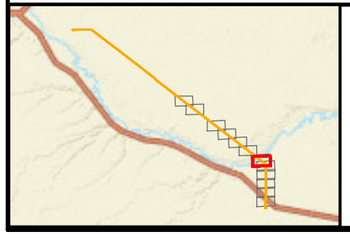
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	5





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

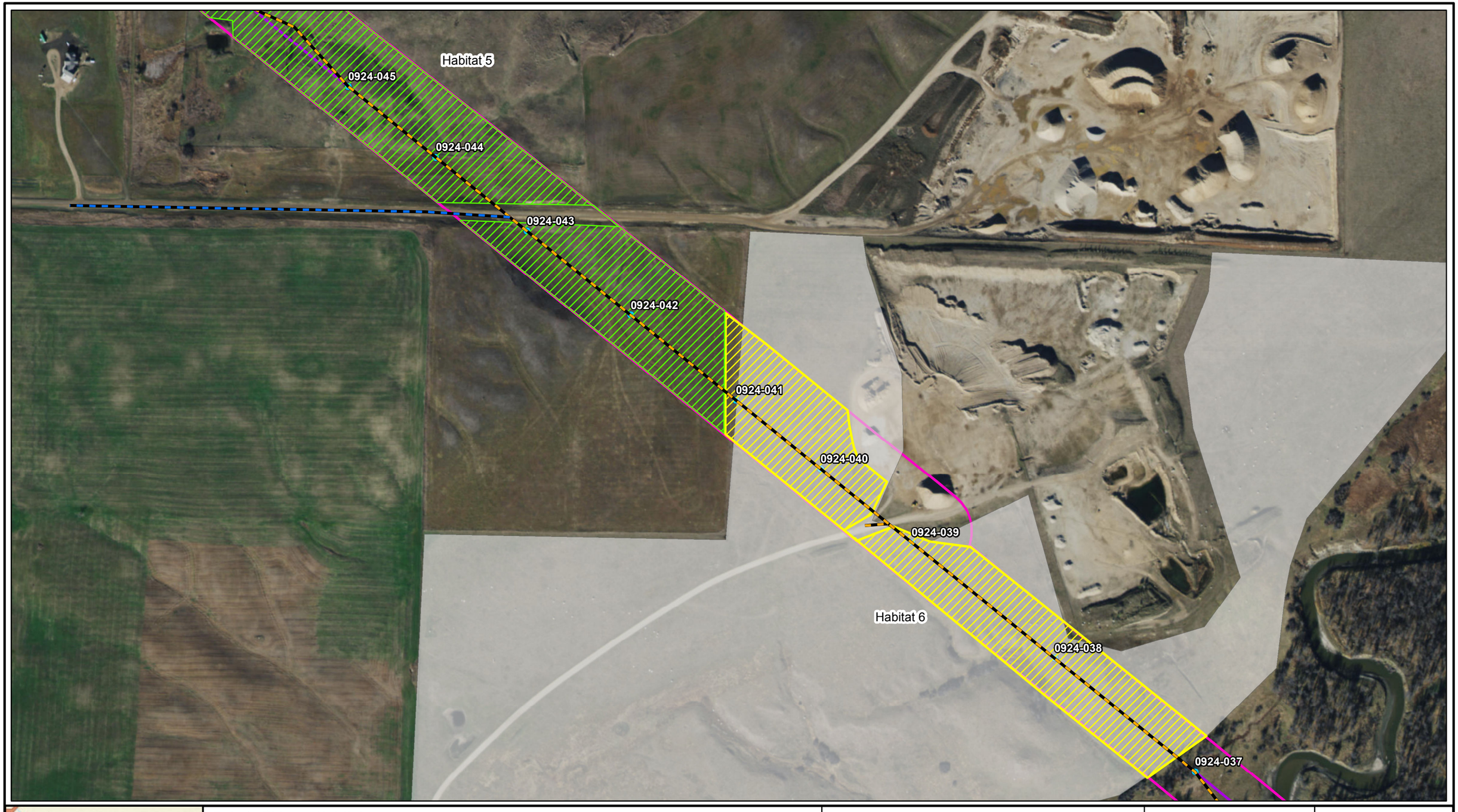
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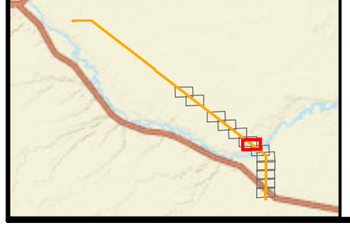
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	6





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat

Identified via Desktop Analysis

Habitat Condition Identified in the Field

Moderate

Low

Project Feature

Preliminary Structure Location

Preliminary 230/115 kV Centerline

Survey Corridor

Access Route

Primary Access

Secondary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

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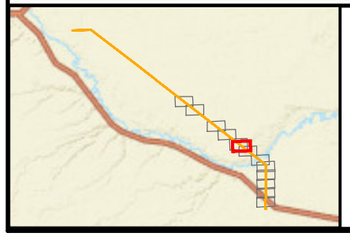
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM	10/5/2016
Approved:	JDC	10/5/2016
Scale:		1:4,800
PROJECT NUMBER		60342328
MAP NUMBER		7





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 115 kV Centerline
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

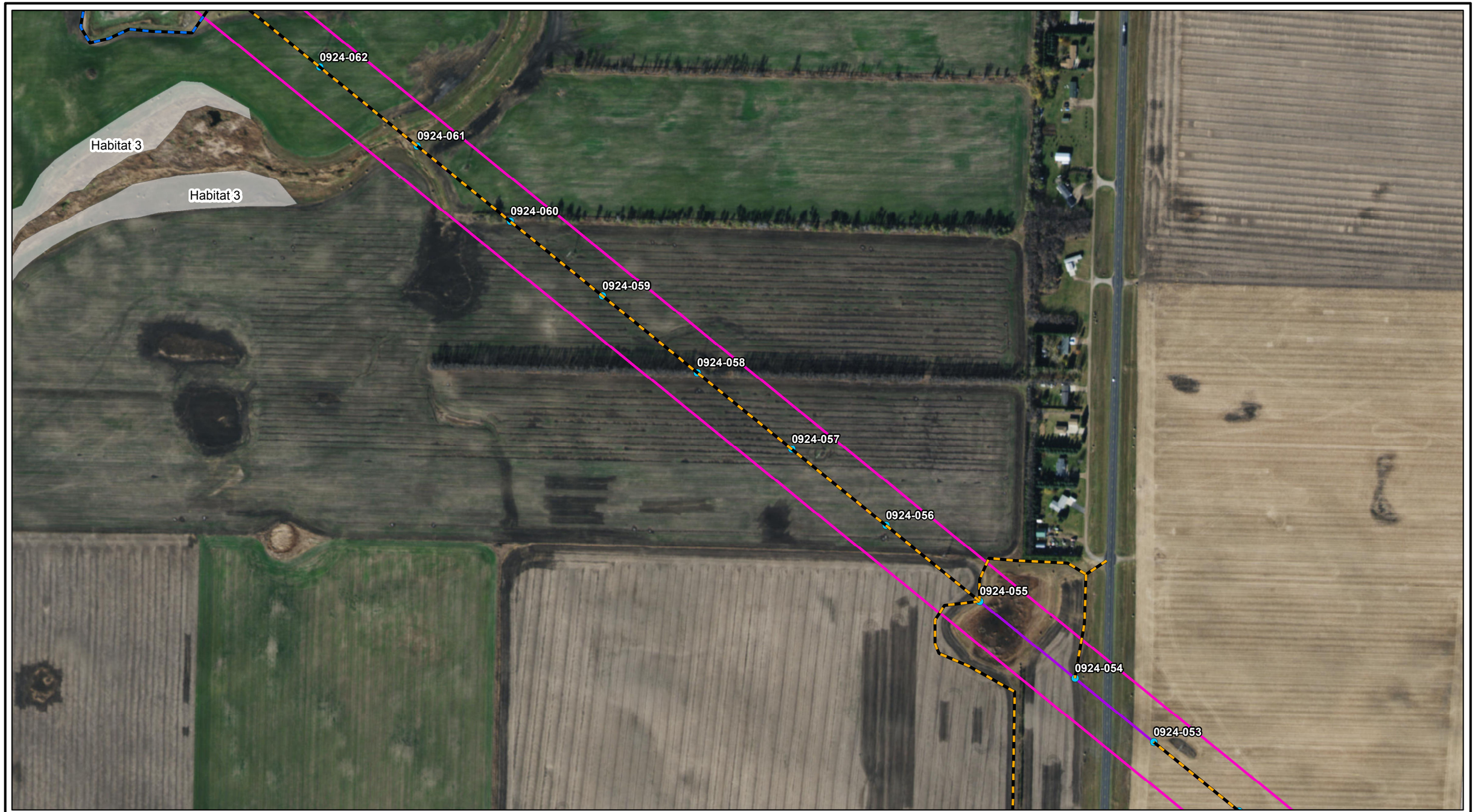
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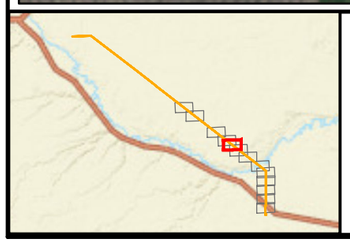
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	8





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 230/115 kV Centerline

- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

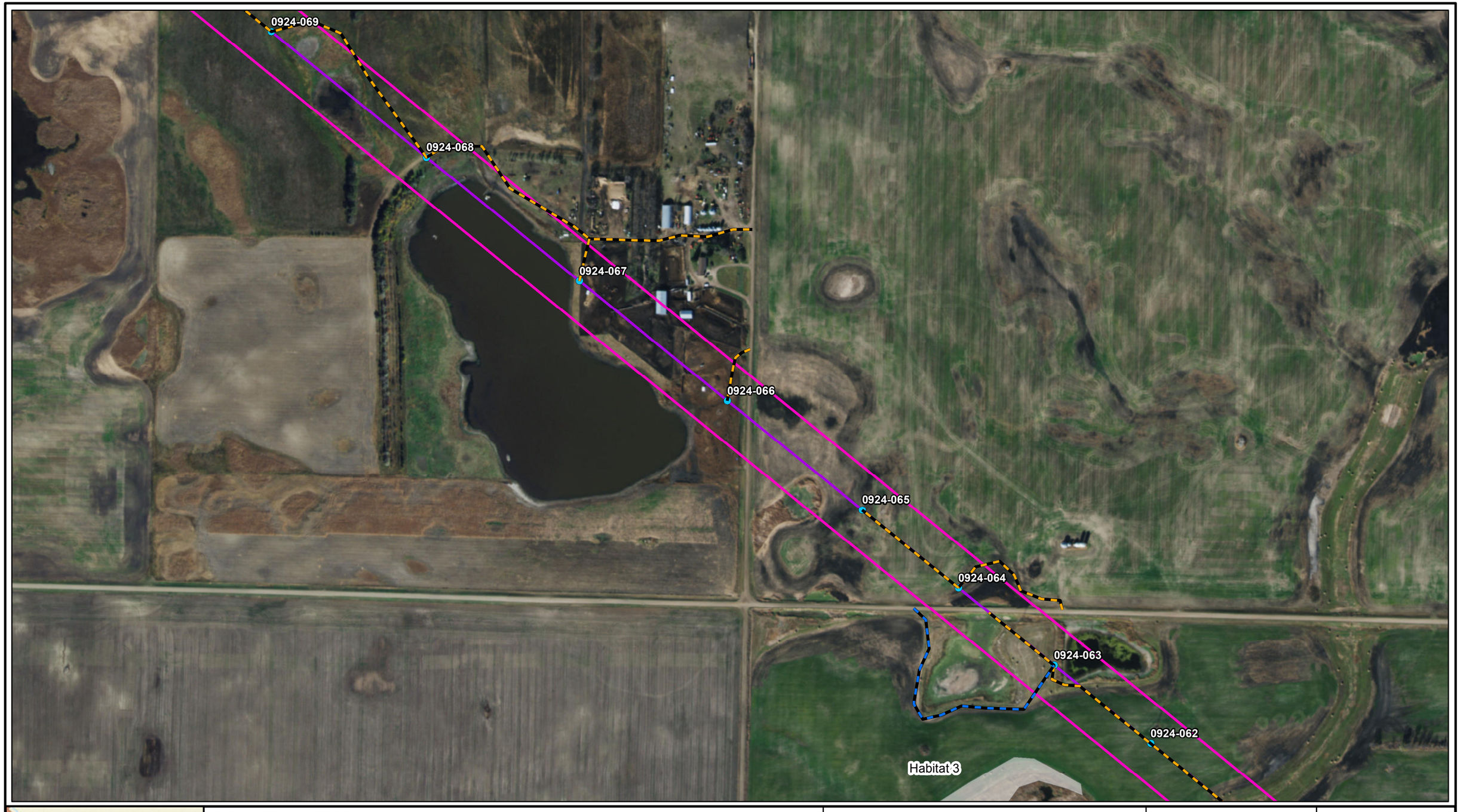
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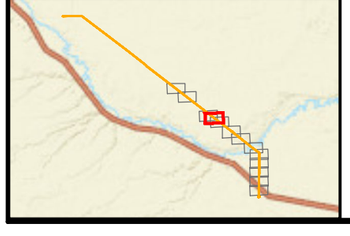
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	9





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access
- Secondary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

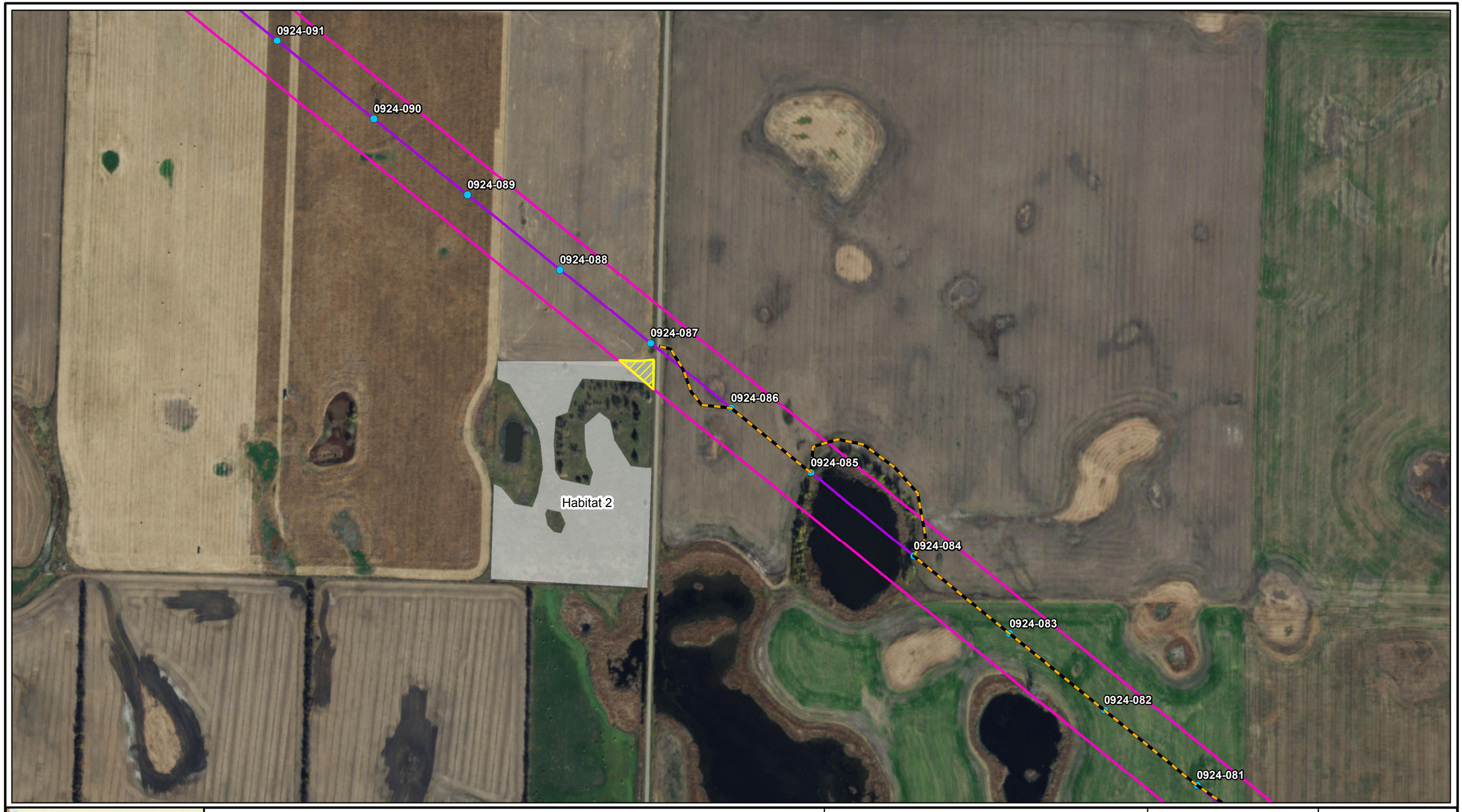
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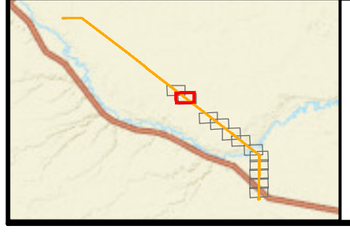
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM	10/5/2016
Approved:	JDC	10/5/2016
Scale:		1:4,800
PROJECT NUMBER		60342328
MAP NUMBER		10





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat
- Identified via Desktop Analysis

Habitat Condition Identified in the Field
- Moderate
- Low

Project Feature
- Preliminary Structure Location
- Preliminary 230/115 kV Centerline
- Survey Corridor

Access Route
- Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

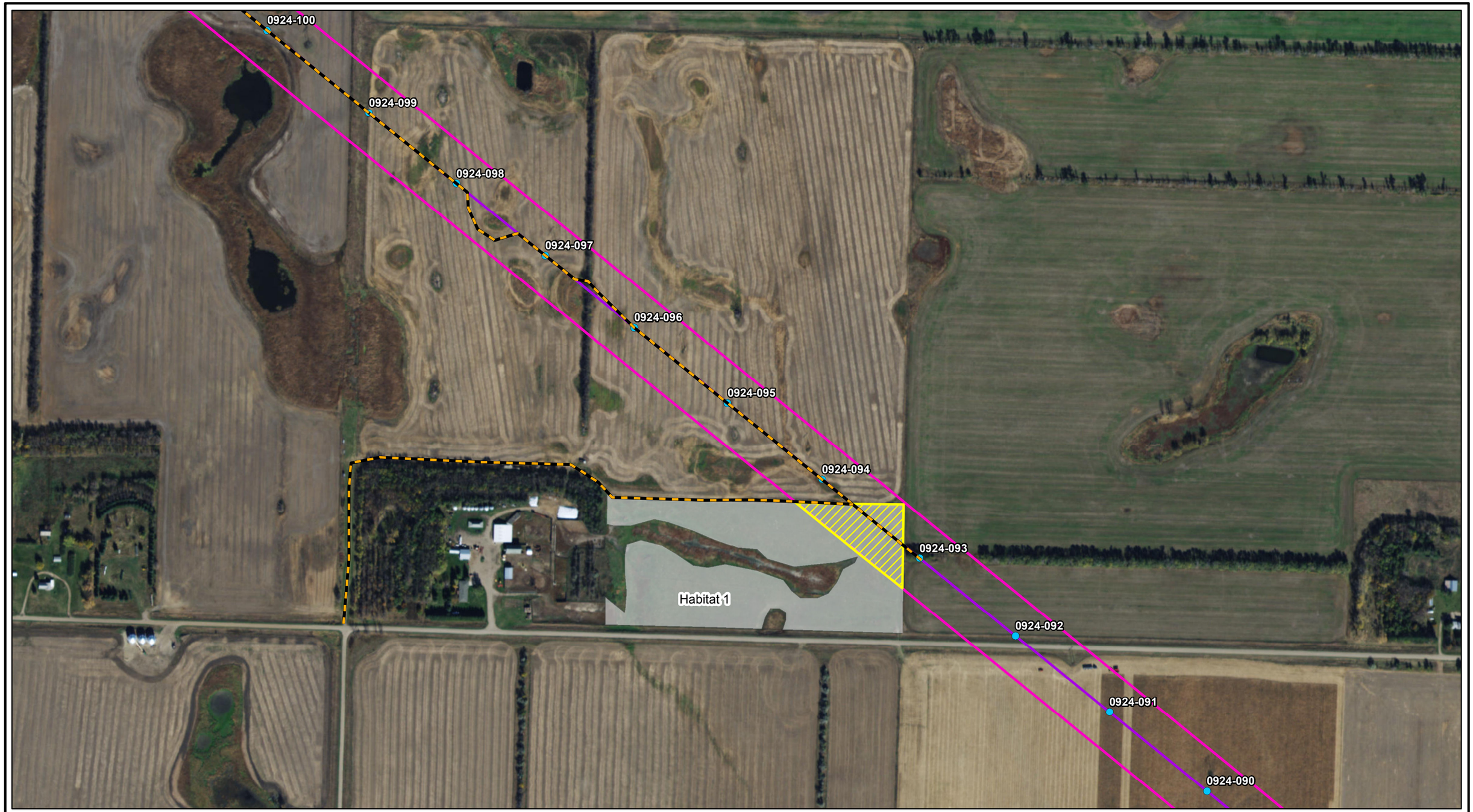
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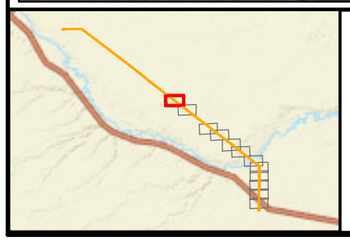
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Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM 10/5/2016
Approved:	JDC 10/5/2016
Scale:	1:4,800
PROJECT NUMBER	60342328
MAP NUMBER	11





Dakota Skipper Habitat

Potenital Dakota Skipper Habitat

Identified via Desktop Analysis

Habitat Condition Identified in the Field

Moderate

Low

Project Feature

Preliminary Structure Location

Preliminary 230/115 kV Centerline

Survey Corridor

Access Route

Primary Access

Magic City to McHenry 230kV Project
Potential Dakota Skipper Habitat Map
Ward and McHenry Counties, North Dakota

N

0 200 400 Feet

Prepared For: Xcel Energy® RESPONSIBLE BY NATURE™

Prepared By: AECOM

Drawn:	MMM	10/5/2016
Approved:	JDC	10/5/2016
Scale:		1:4,800
PROJECT NUMBER		60342328
MAP NUMBER		12

Appendix A

USFWS Official Threatened and Endangered Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
North Dakota Ecological Services Field Office
3425 MIRIAM AVENUE
BISMARCK, ND 58501
PHONE: (701)250-4481 FAX: (701)355-8513
URL:
www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Consultation Code: 06E15000-2016-SLI-0016 December 17, 2015
Event Code: 06E15000-2016-E-00094
Project Name: Minot

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment

United States Department of Interior
Fish and Wildlife Service

Project name: Minot

Official Species List

Provided by:

North Dakota Ecological Services Field Office
3425 MIRIAM AVENUE
BISMARCK, ND 58501
(701) 250-4481
http://www.fws.gov/northdakotafieldoffice/endspecies/endangered_species.htm

Consultation Code: 06E15000-2016-SLI-0016
Event Code: 06E15000-2016-E-00094

Project Type: TRANSMISSION LINE

Project Name: Minot
Project Description: Construct 230 kV Transmission Line

Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: McHenry, ND | Ward, ND

United States Department of Interior
Fish and Wildlife Service

Project name: Minot

Endangered Species Act Species List

There are a total of 7 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Birds	**Status**	**Has Critical Habitat**	**Condition(s)**
Piping Plover *(Charadrius melodus)* Population: except Great Lakes watershed	Threatened	Final designated	
Red Knot *(Calidris canutus rufa)*	Threatened		
Sprague's Pipit *(Anthus spragueii)*	Candidate		
Whooping crane *(Grus americana)* Population: except where EXPN	Endangered	Final designated	
Insects			
Dakota Skipper *(Hesperia dacotae)*	Threatened	Final designated	
Mammals			
Gray wolf *(Canis lupus)* Population: U.S.A.: All of AL, AR, CA, CO, CT, DE, FL, GA, IA, IN, IL, KS, KY, LA, MA, MD, ME, MI, MO, MS, NC, ND, NE, NH, NJ, NV, NY, OH, OK, PA, RI, SC, SD, TN, TX, VA, VT, WI, and WV; and portions of AZ, NM, OR, UT, and WA. Mexico.	Endangered		
Northern long-eared Bat *(Myotis septentrionalis)*	Threatened		

Critical habitats that lie within your project area

There are no critical habitats within your project area.

Appendix B

Raptor Observation/Nest Survey Data Forms

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Raptor 1

Centerline | Re-Route | Access Road | Ancillary Facility | ✠ransmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-176**
Team: **LM & RK**	State/County: **ND / Ward**	Quad Name:
Township: **154N** Range: **82W** Section: **1**		BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain:

Nest Habitat

Nest Present at Location: **No**	Species:
Nest Status:	Nest Condition:
Nest Substrate:	Vegetation Type:
Height of Substrate (ft.):	Height of Nest in Substrate (ft.):
Nest Exposure:	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species: **Swainson's Hawk**
Number: **1**
Other:

Comments (e.g., proximity to other nests or disturbance)

No Nests observed – Perched on a Cottonwood

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Raptor 2

Centerline | Re-Route | Access Road | Ancillary Facility | ✠ Transmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-148**
Team: **LM & RK**	State/County: **ND / Ward**	Quad Name:
Township: **154N**	Range: **81W** Section: **9**	BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain:

Nest Habitat

Nest Present at Location: **No**	Species:
Nest Status:	Nest Condition:
Nest Substrate:	Vegetation Type:
Height of Substrate (ft.):	Height of Nest in Substrate (ft.):
Nest Exposure:	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species: **Swainson's Hawk**
Number: **1**
Other:

Comments (e.g., proximity to other nests or disturbance)

No Nests observed – On top of Transmission pole in agriculture field

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Raptor 3

Centerline | Re-Route | Access Road | Ancillary Facility | ✠ransmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-050**
Team: **LM & RK**	State/County: **ND / McHenry**	Quad Name:
Township: **153N**	Range: **80W** Section: **11**	BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain:

Nest Habitat

Nest Present at Location: **No**	Species:
Nest Status:	Nest Condition:
Nest Substrate:	Vegetation Type:
Height of Substrate (ft.):	Height of Nest in Substrate (ft.):
Nest Exposure:	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species: **Red Tailed Hawk**
Number: **1**
Other:

Comments (e.g., proximity to other nests or disturbance)

Near wind turbines

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Nest 1

Centerline | Re-Route | Access Road | Ancillary Facility | ☒ Transmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-050**
Team: **LM & RK**	State/County: **ND / Ward**	Quad Name:
Township: **154N**	Range: **81W**	Section: **7** BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain:

Nest Habitat

Nest Present at Location: **Yes**	Species: **Unknown**
Nest Status: **Unoccupied**	Nest Condition: **Intact**
Nest Substrate: **Sticks**	Vegetation Type: **Dead trees**
Height of Substrate (ft.): **60**	Height of Nest in Substrate (ft.): **30**
Nest Exposure:	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species:
Number:
Other:

Comments (e.g., proximity to other nests or disturbance)

Overlooking wetland – appears to be unoccupied. Likely an eagle nest due to size

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Nest 2

Centerline | Re-Route | Access Road | Ancillary Facility | ✠ransmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-085**
Team: **LM & RK**	State/County: **ND / Ward**	Quad Name:
Township: **154N**	Range: **80W**	Section: **32** BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain:

Nest Habitat

Nest Present at Location: **Yes**	Species: **Unknown**
Nest Status: **Unoccupied**	Nest Condition: **Intact**
Nest Substrate: **Sticks**	Vegetation Type: **Dead trees**
Height of Substrate (ft.): **35**	Height of Nest in Substrate (ft.): **25**
Nest Exposure: **Visible**	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species:
Number:
Other:

Comments (e.g., proximity to other nests or disturbance)

In tree in a wetland

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Nest 3

Centerline | Re-Route | Access Road | Ancillary Facility | ✠ransmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-071**
Team: **LM & RK**	State/County: **ND / McHenry**	Quad Name:
Township: **153N**	Range: **80W** Section: **4**	BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain: Picture 8, 9, 10 S

Nest Habitat

Nest Present at Location: **Yes**	Species: **Red Tailed Hawk**
Nest Status: **Occupied – Hawk nearby**	Nest Condition: **Good**
Nest Substrate: **Sticks**	Vegetation Type: **Dead trees**
Height of Substrate (ft.): **60**	Height of Nest in Substrate (ft.): **50**
Nest Exposure: **Exposed**	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species: **Red Tailed Hawk**
Number: **2**
Other:

Comments (e.g., proximity to other nests or disturbance)

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Nest 4

Centerline | Re-Route | Access Road | Ancillary Facility | ✠ransmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-073**
Team: **LM & RK**	State/County: **ND / McHenry**	Quad Name:
Township: **153N**	Range: **80W** Section: **4**	BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain: Picture 11, 12 S

Nest Habitat

Nest Present at Location: **Yes**	Species: **Unknown**
Nest Status: **Unoccupied**	Nest Condition: **Intact**
Nest Substrate: **Leaves/Sticks**	Vegetation Type: **Cottonwood**
Height of Substrate (ft.): **50**	Height of Nest in Substrate (ft.): **40**
Nest Exposure: **Protected by trees**	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species:
Number:
Other:

Comments (e.g., proximity to other nests or disturbance)

Photos

AECOM

RAPTOR OBSERVATION / NEST SURVEY

Feature ID: Nest 5, Raptor 4

Centerline | Re-Route | Access Road | Ancillary Facility | ☒ Transmission Line | Other

Date: **8-30-2016**	Client/Project Name: **Xcel Energy Magic City Transmission Line**	Milepost: **0924-036**
Team: **LM & RK**	State/County: **ND / McHenry**	Quad Name:
Township: **153N**	Range: **80W** Section: **13**	BLM Map Unit Name:
Logbook No.:	Logbook Pg.:	Tract No.:

Rationale for habitat survey: Appears On Pre-Survey Target List

X Field Determination - Explain: Picture 25, 26

Nest Habitat

Nest Present at Location: **Yes**	Species: **Eagle**
Nest Status: **Unoccupied**	Nest Condition: **Intact**
Nest Substrate: **Leaves/Sticks**	Vegetation Type: **Green Ash**
Height of Substrate (ft.): **50**	Height of Nest in Substrate (ft.): **35**
Nest Exposure: **Semi-visible**	Number of Eggs:
Extends Beyond ROW?:	Number of Young:
Ownership:	Other:

Raptor Observation

Species: Red Tailed Hawk
Number: 1
Other:

Comments (e.g., proximity to other nests or disturbance)

USFWS recorded eagle nest near Souris River

Photos

Appendix C

Sensitive Habitat Data Forms

AECOM Environment
1601 Prospect Parkway
Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 1

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-093
Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T154N R80W S30
Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 2,3 N

Rationale for habitat survey:
X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Invaded Hayland

Acreage: 20

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Species	Approximate % Cover
Crested Wheatgrass	60
Kochia	20

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Song birds	Audial, Visual		Tree Cavities
Butterflies - White	Visual		Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			(Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / (Adjacent)	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	(On-site) / (Adjacent)	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other:	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)
Grazing by cattle and adjacent hayland

HABITAT QUALITY	☐ High	☐ Moderate	**X** Low

Rationale for selected rank:
Nonnative plant cover

AECOM Environment
1601 Prospect Parkway
Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 2

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-087
Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T154N R80W S31
Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 5, 6, 7 W

Rationale for habitat survey:
X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Invaded pasture

Acreage: 20

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Species	Approximate % Cover
Smooth Bromegrass	60
Canada Thistle	25

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Song birds	Audial, Visual	Both	Tree Cavities
Butterflies - White	Visual	Both	Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			(Wetlands) (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / (Adjacent)	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	(On-site) / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	(On-site) / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)
Grazing by cattle

HABITAT QUALITY	☐ High	☐ Moderate	**X** Low

Rationale for selected rank:
Disturbed, invaded rangeland

AECOM Environment
1601 Prospect Parkway
Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 3

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-061

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S10

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 13, 14, 15 SE

Rationale for habitat survey:

X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Invaded grassland/drainage between ag fields

Acreage: 15

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Species	Approximate % Cover
Smooth Bromegrass - Uplands	90
Cattails - Wetlands	90

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Butterflies - White	Visual	Both	Tree Cavities
			Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			(Wetlands) (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / (Adjacent)	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)

HABITAT QUALITY	☐ High	☐ Moderate	**X** Low

Rationale for selected rank:
Low species diversity – Highly disturbed

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Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 4

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-051

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S11

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 16, 17, 18 N

Rationale for habitat survey:

X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Grassland

Acreage: 40

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS

Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES

Species	Approximate % Cover
Kentucky Bluegrass	70
White Sweet Clover	20
Silverleaf Scurfpea	5

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY

Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
			Tree Cavities
			Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES

Type (Circle if applies)	Circle On-site or Adjacent to Site	Type (Circle if applies)	Circle On-site or Adjacent to Site
Agriculture	On-site / Adjacent	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)
Gravel access road and wind turbines. Mowing near road.

HABITAT QUALITY	☐ High	**X** Moderate	Low

Rationale for selected rank:
Some native forbs, including coneflower but has invasive species and is fragmented. Surrounded by disturbances

AECOM Environment
1601 Prospect Parkway
Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 5

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-044

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S14

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 19-22 N

Rationale for habitat survey:

X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Rangeland with hayed ditch.

Acreage: 125

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Species	Smooth Brome 10%
White Sage 5%	Big bluestem 5%
Western snowberry 5%	Canada thistle 5%
Purple coneflower 4%	Blue grama 5%

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Red Tailed Hawk	Audial		Tree Cavities
White butterflies	Visual		Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / Adjacent	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)

HABITAT QUALITY	☐ High	**X** Moderate	Low

Rationale for selected rank:
Surrounding areas disturbed by gravel road, agriculture, wind turbines, gravel pits

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1601 Prospect Parkway
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SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 6

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-039

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S13, 14

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 23, 24 N

Rationale for habitat survey:

X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Heavily grazed/ invade rangeland/gravel pits

Acreage: 300

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Species	Smooth Brome 10%
White Sage 5%	Big bluestem 5%
Western snowberry 5%	Canada thistle 5%
Purple coneflower 4%	Blue grama 5%

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Red Tailed Hawk	Audial		Tree Cavities
White butterflies	Visual		Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / Adjacent	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)

HABITAT QUALITY	☐ High	**X** Moderate	Low

Rationale for selected rank:
Surrounding areas disturbed by gravel road, agriculture, wind turbines, gravel pits

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1601 Prospect Parkway
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SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 7

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-029

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S24

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 27, 28, 29 SE

Rationale for habitat survey:

X appears on pre-survey target list ☐ field determination (explain)

COMMUNITY TYPE (List of land use/vegetation cover types)

Grassland with invasive species and Green Ash drainages

Acreage: 90

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Smooth Brome 10%	Missouri Goldenrod 10%
Western Snowberry 10%	Big bluestem 10%
Kentucky Bluegrass 10%	Canada Thistle 5%

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Northern Flicker	Visual		Tree Cavities
			Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / Adjacent	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)
Some of the land area is hayed

HABITAT QUALITY	☐ High	Moderate	**X** Low

Rationale for selected rank:
Some native plants, also some disturbance and invasive species

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Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 8

☐ Centerline ☐ Re-Route ☐ Access Road ☐ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-010

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S25

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 30, 31, 32 NW

Rationale for habitat survey:
X appears on pre-survey target list field determination (explain) _____

COMMUNITY TYPE (List of land use/vegetation cover types)

Wetland / tree row / railroad / grazing

Acreage: 500

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Crested Wheatgrass 60%	Kentucky Bluegrass 10%
Western snowberry 6%	Blue grama 5%
Absinthe wormwood 3%	Curly cup gumweed 2%

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
White butterflies	Visual		Tree Cavities
Northern Flicker	Visual		Nests Observed
Crow	Visual		Dens, Burrows
Killdeer	Audial		Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / Adjacent	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)
Water tanks and buildings

HABITAT QUALITY	☐ High	Moderate	**X** Low

Rationale for selected rank:
Mostly crested wheatgrass with very few forbs

AECOM Environment
1601 Prospect Parkway
Ft. Collins, CO 80525

SENSITIVE HABITAT SURVEY

Feature ID #: Habitat 9

□ Centerline □ Re-Route □ Access Road □ Ancillary Facility **X** Other: **Transmission Line**

Date: 8-30-16	Project Name & No.: Xcel Energy Magic City Transmission Line	Milepost: 0924-010

Investigators: L. Meyers; R. King	State/County: ND/McHenry	Quad Name:T153N R80W S36

Logbook No.:	Logbook Pg. No.:	Tract No.:	Picture No.: 33, 34, 35 S

Rationale for habitat survey:
X appears on pre-survey target list field determination (explain) _____

COMMUNITY TYPE (List of land use/vegetation cover types)

Wetland / tree row / railroad / grazing

Acreage: 40

THREATENED AND ENDANGERED WILDLIFE AND/OR PLANTS		
Species	Observed? Evidence?	Comments
N/A		

DOMINANT PLANT SPECIES	
Smooth brome 15%	Plains cottonwood 15%
Green Ash 15%	Cattails 10%
Prairie cordgrass 10%	Western snowberry 10%

WILDLIFE COMMUNITIES OBSERVED WITHIN THE VICINITY			
Species	Evidence (Visual, Audial, Scat, etc.)	Apparently transient or resident? (Note Evidence)	Habitat (Circle if Present)
Crickets	Audial		Tree Cavities
Butterflies	visual		Nests Observed
			Dens, Burrows
			Rocky Basking Site
			Vernal Pools
			Adjacent Food Supply
			Wetlands (PEM/PSS/PFO)
			Other:

SITE DISTURBANCES			
Type (Circle if applies)	**Circle On-site or Adjacent to Site**	**Type (Circle if applies)**	**Circle On-site or Adjacent to Site**
Agriculture	On-site / Adjacent	Urban runoff	On-site / Adjacent
Silviculture	On-site / Adjacent	Hydrologic / Habitat Modification	On-site / Adjacent
Construction/Development	On-site / Adjacent	Resource Extraction / Exploration/Development	On-site / Adjacent
Vegetation removal / mowing	On-site / Adjacent	Reclamation	On-site / Adjacent
Land Disposal (Runoff / Leachate)	On-site / Adjacent	Other: Abandoned farm equipment	On-site / Adjacent

DISTURBANCE PROFILE (provide site details of disturbances circled above)
Water tanks and buildings, appears to have many areas with spoil piles

HABITAT QUALITY	□ High	Moderate	**X** Low

Rationale for selected rank:
Highly disturbed / contains railroad and is adjacent to HWY 52

Appendix D

Photographic Log

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
1	8-30-2016

Direction Photo Taken:

S

Description:

View of Nest 1. Likely an Eagle nest



Photo No.	Date
2	8-30-2016

Direction Photo Taken:

N

Description:

View of Habitat 1



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
3	8-30-2016

Direction Photo Taken:

NW

Description:

View of Habitat 1.



Photo No.	Date
4	8-30-2016

Direction Photo Taken:

SE

Description:

View of Nest 2.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
5	8-30-2016

Direction Photo Taken:

SW

Description:

View of Habitat 2.



Photo No.	Date
6	8-30-2016

Direction Photo Taken:

W

Description:

View of Habitat 2.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
7	8-30-2016

Direction Photo Taken:

NW

Description:

View of Habitat 2.



Photo No.	Date
8	8-30-2016

Direction Photo Taken:

S

Description:

Wide view of Nest 3.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
9	8-30-2016

Direction Photo Taken:

S

Description:

View of Nest 3.



Photo No.	Date
10	8-30-2016

Direction Photo Taken:

N

Description:

View of red tailed hawk near Nest 2.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
11	8-30-2016

Direction Photo Taken:

SW

Description:

View of Nest 4.

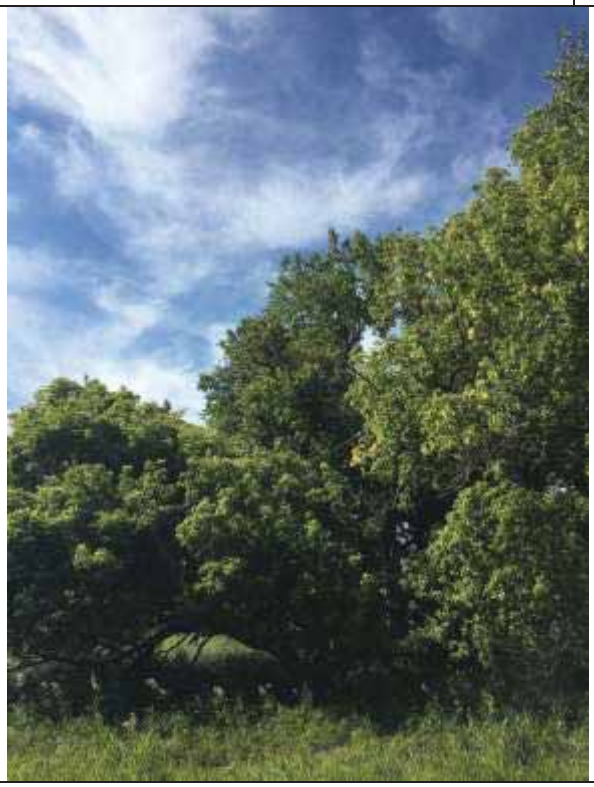


Photo No.	Date
12	8-30-2016

Direction Photo Taken:

SW

Description:

View of Nest 4.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
13	8-30-2016

Direction Photo Taken:

S

Description:

View of Habitat 3.



Photo No.	Date
14	8-30-2016

Direction Photo Taken:

SE

Description:

View of Habitat 3.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
15	8-30-2016

Direction Photo Taken:

E

Description:

View of Habitat 3.



Photo No.	Date
16	8-30-2016

Direction Photo Taken:

W

Description:

View of Habitat 4.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
17	8-30-2016

Direction Photo Taken:

NW

Description:

View of Habitat 4.



Photo No.	Date
18	8-30-2016

Direction Photo Taken:

N

Description:

View of Habitat 4.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
19	8-30-2016

Direction Photo Taken:

NE

Description:

View of Habitat 5.



Photo No.	Date
20	8-30-2016

Direction Photo Taken:

N

Description:

View of Habitat 5.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
21	8-30-2016

Direction Photo Taken:

N

Description:

View of Habitat 5.



Photo No.	Date
22	8-30-2016

Direction Photo Taken:

N

Description:

View of Habitat 5.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
23	8-30-2016

Direction Photo Taken:

S

Description:

View of Habitat 6.



Photo No.	Date
24	8-30-2016

Direction Photo Taken:

SE

Description:

View of Habitat 6.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
25	8-30-2016

Direction Photo Taken:

NE

Description:

View of Nest 5. Eagle Nest



Photo No.	Date
26	8-30-2016

Direction Photo Taken:

NE

Description:

View of Nest 5. Eagle Nest



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
27	8-30-2016

Direction Photo Taken:

S

Description:

View of Habitat 7.



Photo No.	Date
28	8-30-2016

Direction Photo Taken:

SE

Description:

View of Habitat 7.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
29	8-30-2016

Direction Photo Taken:

SE

Description:

View of Habitat 7.



Photo No.	Date
30	8-30-2016

Direction Photo Taken:

S

Description:

View of Habitat 8.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
31	8-30-2016

Direction Photo Taken:

SW

Description:

View of Habitat 8.



Photo No.	Date
32	8-30-2016

Direction Photo Taken:

W

Description:

View of Habitat 8.



AECOM

PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
33	8-30-2016

Direction Photo Taken:

E

Description:

View of Habitat 9.



Photo No.	Date
34	8-30-2016

Direction Photo Taken:

S

Description:

View of Habitat 9.



PHOTOGRAPHIC LOG

Client Name:	Site Location:	Project No.
Xcel Energy	Proposed Magic City Substation and Transmission Line	60426815

Photo No.	Date
35	8-30-2016

Direction Photo Taken:

SW

Description:

View of Habitat 9.



About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

More information on AECOM and its services can be found at www.aecom.com.

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Memorandum

To	Tom Hillstrom, Xcel Energy	Page	1
CC	Leslie Knapp, Tetra Tech		
Subject	North Prairie Township Reroute Desktop Habitat Review Xcel Energy, Minot Load Serving Project McHenry and Ward Counties, North Dakota		
From	Jared Brandell-Douglas, Tetra Tech		
Date	February 23, 2017		

Introduction and Purpose

Xcel Energy is proposing to construct the Minot Load Serving Project (Project). The Project would consist of constructing a new substation and an approximately 20.5-mile-long 230 kV transmission line between the new substation (Magic City Substation) in Ward County and the existing McHenry Substation, in McHenry County. Xcel Energy's intent is to build the 230 kV line on new single pole steel structures generally parallel to an existing 115 kV line. Once the new 230 kV transmission line has been constructed, the existing 115 kV line would be moved onto the new structures (230/115 kV double circuit structures) and the existing 115 kV line structures would be removed.

In 2016, Xcel Energy contracted with AECOM to conduct raptor and threatened and endangered species (T&E) habitat surveys, concentrating on Dakota skipper (*Hesperia dacotae)* habitat within the Project area. Field surveys were completed along the majority of the Project Route, as reported in the *Raptor and Habitat Survey Report for the Magic City Substation to McHenry Substation 230 kV Transmission Line Project*, November 2016. The Project Corridor that was surveyed followed the existing 115 kV transmission line. However, North Prairie Township, located on the western side of McHenry County, has an ordinance requiring utilities to be built on section lines. Therefore, to meet the requirements of this North Prairie Township ordinance, a reroute was identified in the winter of 2017 that deviates from the existing 115 kV transmission line and follows property lines in North Prairie Township in McHenry County and New Prairie Township in Ward County. This reroute, known as the North Prairie Township reroute, is approximately 4.2 miles long and deviates from the existing 115 kV transmission line for approximately 3.0 miles. Based upon input from North Prairie Township, the reroute follows fence lines in order to meet the ordinance requirements (**Figure 1**).

As the North Prairie Township reroute was identified during winter, Xcel Energy had Tetra Tech, a consultant on the Project, conduct a desktop review of the 4.2 mile North Prairie Township reroute to determine if possible T&E habitat was present.

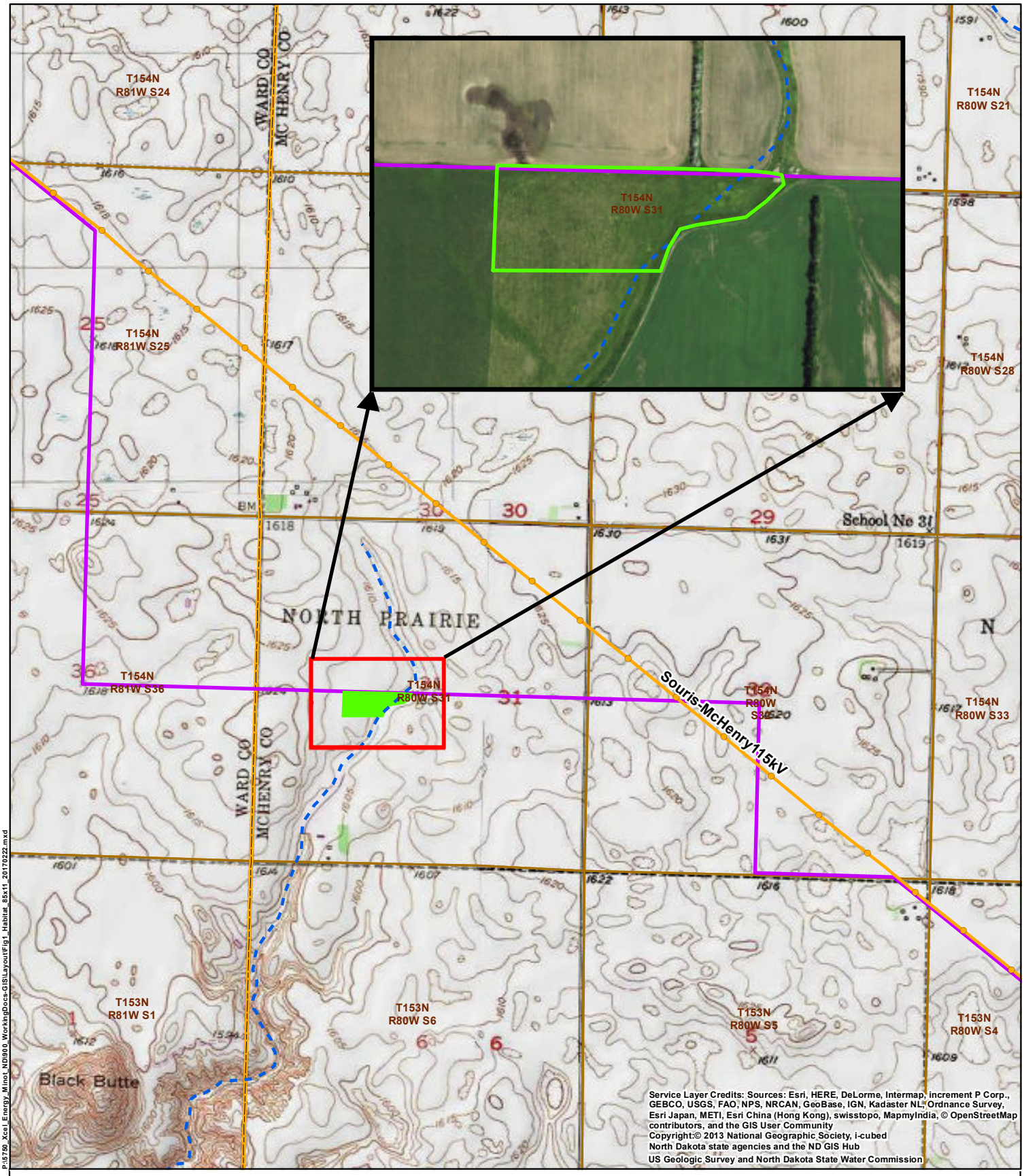
Results

During the desktop review of the North Prairie Township reroute, Tetra Tech identified an approximately 1,100 foot long segment of grassland that is crossed by the Project (**Figure 1**). After identifying the grassland area, historic aerial photographs on Google Earth, dating back to September of 1997, were reviewed to determine if the grassland could be potential suitable Dakota skipper habitat. Historic aerials were specifically reviewed to determine if the grassland area had previously been cultivated, as Dakota skippers are known to only inhabit high quality native prairies that are diverse in flowering herbaceous plants and native grasses, and are not known to occur within restored prairies (former cropland that has been replanted to native prairie). Historic imagery did not show the area as being cultivated; however, the aerial photographs indicated that the area had been previously hayed or used as pasture.

As a follow-up to the desktop review, Xcel Energy land agents contacted the landowner on February 21, 2017 to inquire about the known historic uses of the grassland area. The landowner stated that the area has been cultivated in the past. In addition to previous cultivation, the landowner stated that since there is a ditch located on the eastern portion of the area, the area has been seeded with grasses and used as a pasture for horses.

Suitable habitat for Dakota skipper depends on high quality native prairie that is diverse in flowering herbaceous plants and native grasses. Based upon the information provided by the landowner, such as the area being previously cultivated and seeded to grasses to be used as pasture, it is not likely that the approximately 1,100 foot grassland area identified along the North Prairie Township reroute contains high quality native prairie. Therefore, it is not likely that suitable habitat for the Dakota skipper is present in this area.

Tetra Tech confirmed this determination that Dakota skipper habitat is not likely present along the North Prairie Township reroute with AECOM biologists Lindsey Meyers, PhD, and John Cannon, who conducted the field surveys and field survey report for the Project in November 2016.



P:\5750_Xcel_Energy_Minot_ND\900_WorkingDocs-GIS\Layout\Fig1_Habitat_85x11_20170222.mxd

Project Feature
- Proposed 230/115 kV Alignment
- Grassland Area

Existing Utility
- 115 kV Transmission Line

Stream
- Stream (Intermittent)
- Stream (Perennial)

Jurisdiction
- County
- Section

0 500 1,000 2,000 Feet

Xcel Energy® RESPONSIBLE BY NATURE®

Minot Load Serving Project

McHenry and Ward Counties, North Dakota

Figure 1
North Prairie Township Reroute Map
February 2017