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## **ENVIRONMENTAL ASSESSMENT**

In the Matter of the Route Permit Application for a 115/69 Kilovolt Transmission Line Rebuild from a Newly Proposed West New Ulm Substation to the Existing Fort Ridgely Substation.

**RESPONSIBLE GOVERNMENT UNIT**

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**ABSTRACT**

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Pursuant to the provisions of Minnesota Statutes, chapter 216E, Xcel Energy filed a route permit application with the Minnesota Public Utilities Commission (the Commission) on August 29, 2008, for a proposed 115/69 kilovolt (kV) transmission line rebuild.

Xcel is proposing to construct a new, 4.2-mile 115 kV transmission line between a newly proposed West New Ulm substation in Brown County, Minnesota, and the existing Fort Ridgely substation in Nicollet County, Minnesota. Approximately 3.8 miles or 90 percent of the new 115 kV transmission line will be constructed along the existing Fort Ridgely 69 kV transmission line alignment using double circuit 115/69 kV structures that would accommodate the new 115 kV line and the existing 69 kV line on a single structure alignment. The proposed project also involves the construction of a new substation (West Ulm substation) near New Ulm in Brown County, Minnesota, and modifications to the existing Fort Ridgely substation.

The project is being evaluated in conformance with the alternative review process (Minnesota Rules 7849.5500). The Office of Energy Security is the responsible government unit for preparing the environmental assessment required for a route permit under this process. An applicant is not required to propose any alternative routes to the preferred under the alternative review process. The Commission has six months to reach a final decision on the route permit starting from the date the Commission determined the route permit application complete.

Persons interested in these matters can register their names on the project docket webpage at: <http://energyfacilities.puc.state.mn.us/Docket.html?Id=19744> or by contacting: Scott Ek, Office of Energy Security, Energy Facilities Permitting, 85 7<sup>th</sup> Place East, Suite 500, St. Paul, Minnesota 55101, 651.296.8813, [scott.ek@state.mn.us](mailto:scott.ek@state.mn.us).

Additional documents pertaining to this project can be found at the above website or by going to the following: <https://www.edockets.state.mn.us/EFiling/search.jsp> and entering docket number "08-956" under search criteria.

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- Appendix B – Sample Route Permit
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## 1.0 INTRODUCTION

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Xcel Energy (Xcel) has made application to the Minnesota Public Utilities Commission (PUC or the Commission) for a route permit under the alternative permitting process of the Power Plant Siting Act. The permit application is for the construction, operation, and maintenance of a 4.2-mile 115 kilovolt (kV) transmission line and substation (West New Ulm substation).

The applicant proposes a transmission line route that would run between a newly proposed West New Ulm substation in Brown County, Minnesota, and the existing Fort Ridgely substation in Nicollet County, Minnesota. Approximately 3.8 miles or 90 percent of the new 115 kV transmission line will be constructed along the existing Fort Ridgely 69 kV transmission line alignment using double circuit 115/69 kV structures that would accommodate the new 115 kV line and the existing 69 kV line on a single structure alignment. The proposed project also involves the construction of a new substation (West Ulm substation) near New Ulm in Brown County, Minnesota, and modifications to the existing Fort Ridgely Substation.

The applicant indicates that the proposed project would provide transmission support to the entire load of New Ulm Public Utilities by providing an alternate 115 kV transmission source in the region. The project would also provide support to Xcel's system in the Morgan and Sleepy Eye areas as well as general reliability benefits to Xcel's other loads in the area.

Minnesota Office of Energy Security (OES) Energy Facility Permitting (EFP) is tasked with conducting environmental review of applications for route permits. The intent of the environmental review process is to inform the public, the applicant, and decision-makers about potential impacts and possible mitigations for the proposed project.

This environmental assessment (EA) covers the required environmental review of the project and route permit application. Section 2 describes the proposed project, including location, route description, and right-of-way requirements. Section 3 provides information about the proposed engineering and operation of the project. Section 4 describes the proposed construction and maintenance procedures. Section 5 provides information on the high voltage transmission line regulatory framework and route permit process. Section 6 identifies the potential impacts of and mitigation for the proposed route. Section 7 describes the alternatives proposed during the scoping process and their impacts as compared to the proposed route. Section 8 identifies permits and approvals required for the proposed project.

## 2.0 PROJECT DESCRIPTION

The applicant proposes to construct/rebuild approximately 4.2 miles of new 115/69 kV transmission line and a new 115 kV substation to be located in Brown and Nicollet counties, Minnesota. The proposed project would begin at a newly proposed substation (West New Ulm substation) to be located in Brown County, west of New Ulm and travel east crossing the Minnesota River to the existing Fort Ridgely substation in Nicollet County (Figure 1). Approximately 3.8 miles or 90 percent of the new 115 kV transmission line would be constructed along the existing Fort Ridgely 69 kV transmission line alignment using double circuit 115/69 kV structures that would accommodate both the new 115 kV line and the existing 69 kV line on a single structure alignment. The criteria<sup>1</sup> used by the applicant in selecting the preferred route are as follows:

- Maximize use of existing transmission alignments;
- Minimize impacts to residences;
- Minimize use of new right-of-way;
- Minimize impacts to environmental and sensitive resources;
- Avoid a new crossing of the Minnesota River;
- Minimize the length of the new transmission line to reduce the potential area of impact; and
- Locate substation near the intersection of existing transmission lines to minimize the need for new rights-of-way.

### 2.1 Project Location

The proposed project is located in Brown and Nicollet counties, Minnesota. Townships, ranges, and sections for the project are shown below in Table 1. A detailed depiction of the proposed project is presented as Figures 2 through 4.

**Table 1: Project Location Data**

County	Township	Township	Range	Section
Brown	Milford	110N	31W	12, 13, 14
Nicollet	Lafayette	110N	30W	7, 8, 18

<sup>1</sup> Northern States Power Company, Application to the Minnesota Public Utilities Commission for a Route Permit, West New Ulm - Fort Ridgely 115/69 kV Transmission Line Rebuild Project (August 29, 2008).

## 2.2 Route Description

The transmission line route would begin on the north side of the proposed West New Ulm substation. The line would exit the substation as a single 115 kV circuit and head east to County Highway 12. At this point the new 115 kV line would be constructed on new double circuit structures that would accommodate the existing 69 kV circuit. The 115/69 kV line would proceed north along the east side of County Highway 12, following the existing alignment. The 115/69 kV route would turn east at the intersection of the DM&E railroad tracks and County Highway 12, running parallel along the south side of the railroad tracks to a point just east of County Highway 29. Continuing along the existing 69 kV alignment, the line would run cross country northeast, east and then southeast to 23rd North Street in New Ulm. The 115/69 kV line would run along 23rd North Street and across the Minnesota River, following the existing 69 kV alignment. Once across the Minnesota River the 115/69 kV line continues following the existing 69 kV alignment northeast cross country then heading north just after County Road 21 for approximately 950 feet. At this point the line would proceed east as a single 115 kV circuit crossing County Highway 7 and entering the Fort Ridgely substation on the east side.

## 2.3 Route Width

Xcel is requesting a 200 foot route width, 100 feet on each side of the existing 69 kV centerline for the entire length of the proposed route with the exception of County Highway 12, where a 400 foot route width, 200 feet on each side of the existing 69 kV centerline, is requested.

## 2.4 Rights-of-Way

Xcel indicates that a 75 foot wide right-of-way (easement) would be required for the entire length of the proposed transmission line project. The proposed transmission line rebuild would be constructed on the 69 kV centerline and within the existing easements. However, there may also be situations where new easement would be required due to road configurations and transmission line design. It is also anticipated that new easements would be required near both the Fort Ridgely substation and the proposed West new Ulm substation.

## 2.5 Property/Right-of-Way Acquisition

Should a route permit be issued, the applicant would commence the easement acquisition process, to the extent that new right-of-way is needed. Landowners identified as having a legal interest in the real estate on which the transmission facility would be constructed are contacted by the applicant.

Even if an existing easement condition appears to accommodate the project and no new right-of-way is needed, the applicant would still work with a landowner in order to address any construction needs, impacts, damages, or restoration issues.

The applicant may request permission from the landowner to enter the property to conduct a preliminary survey of existing features (natural and man-made) and topography, collect soil samples, and determine appropriate foundation designs. The proposed locations of the transmission structures or substation facility may be staked with permission of the landowner.

Upon completion of the design and survey process, easement negotiations would ensue. The applicant would purchase easement rights from landowners for the transmission facility right-of-way. The easements would give Xcel the right to construct, operate, and maintain the transmission line within the defined right-of-way. The applicant works with landowners to negotiate the terms of new and existing easements that are acceptable to the landowner and the applicant. In rare instances where a negotiated settlement cannot be reached, the applicant may exercise the right of eminent domain pursuant to Minnesota Statute Chapter 117. The applicant indicates in the route permit application that no displacement of residential homes or business is anticipated to occur as a result of this project.

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## 3.0 ENGINEERING AND OPERATION DESIGN

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The proposed project consists of 4.2-miles of new conductor, structures, and one new substation. The designed voltage of the proposed line is 115 kV with a 69 kV underbuild for a majority of the proposed route. This section describes the proposed structure and conductor design, capacity, and associated facilities.

### 3.1 Transmission Line and Structures

High voltage transmission line circuits generally consist of three phases, each at the end of a separate insulator, and physically supported by structures. A phase consists of one or more conductors (single, double, or bundled). A typical conductor is a cable consisting of aluminum wires stranded around a core of steel wires. There may also be shield wires strung above the phases to prevent damage from potential lightning strikes. The shield wire could also include a fiber optic cable that allows for substation protection equipment to communicate with other terminals on the line. Transmission structures and line details are summarized in Table 2.

#### 3.1.1 Conductors

The three phases for this project would each consist of two bundled 795 (Drake) steel supported aluminum conductor or ACSS. The ACSS conductors are 795,000 circular mils or approximately 1.108 inches in diameter and comprised of seven steel wires in the center surrounded by 26 aluminum strands. While similar to conventional aluminum conductor steel reinforced (ACSR), the ACSS conductor has increased conductivity, can operate at a higher temperature, and has less sag. Ultimately, the proposed 115/69 kV transmission line would be a double circuit three-phase, 60 Hz (hertz), alternating current line with the exception of the segments leading into each of the substations which would be separate single circuits.

#### 3.1.2 Poles

The transmission line would be supported by direct-embedded galvanized steel or weathering steel poles with davit arms for the majority of the route. These tangent structures are 75 to 90 feet high with foundations that are approximately 4 feet in diameter with a 300 to 400 foot span between each structure. A drilled pier concrete foundation approximately 6 to 8 feet in diameter is proposed for areas requiring a longer span or for angle and dead-end structures.

Single circuit segments leading into the Fort Ridgely substation and the proposed West New Ulm substation would be constructed using 65 to 80 foot steel poles with davit arms or horizontal post insulators.

Taller structures or double pole structures may be required at the Minnesota River to enable longer spans (600 to 1,200 feet in length) due to elevation changes and to minimize the number of structures in the river's riparian zone.

**Table 2: Transmission Line Structure Design <sup>2</sup>**

Line Voltage (kV)	Conductor	Structure Type	Pole Type	Foundation	Foundation Dia.	Average Height (feet)	Average Span Length (feet)
115	ACSS 795 kcmil 26/7	Single Pole Davit Arm	Self-Supporting Steel (galvanized or weathered finish)	Direct Embed or Drilled Pier Concrete	4 foot or 5 to 6 foot	65-80	300 to 400
115/69	ACSS 795 kcmil 26/7	Single Pole Davit Arm	Self-Supporting Steel (galvanized or weathered finish)	Direct Embed or Concrete, if required	4 foot or 6 to 8 foot	75-90	300 to 400 600 to 1,200 (River Crossing)

### 3.2 Associated Facilities

The applicant is proposing to construct a new West New Ulm substation on approximately 11.5 acres at the northwest corner of the intersection of U.S. Highway 14 and County Highway 12 (Figure 1). Preliminary design of the substation indicates substation dimensions of 740 feet by 675 feet, with a 150 foot setback from the centerline of U.S. Highway 14 and 125 foot setback from the County Highway 12 centerline. The actual substation would be entirely enclosed by a fence and would include a 25 foot by 41 foot electrical equipment enclosure containing control equipment and systems for the substation.

In addition, a new driveway would be installed to service the substation. A stormwater retention pond would also be constructed on-site to address potential stormwater runoff from the graded substation area. Existing drain tiles located in the area would be rerouted or replaced to maintain current drainage patterns.

The new West New Ulm substation would serve as a termination point for the new 115/69 kV line and the existing Essig-Sleepy Eye-Franklin 69 kV line. The substation is also being designed to accommodate potential future transmission line terminations.

<sup>2</sup> Northern States Power Company, Application to the Minnesota Public Utilities Commission for a Route Permit, West New Ulm - Fort Ridgely 115/69 kV Transmission Line Rebuild Project (August 29, 2008).

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## 4.0 CONSTRUCTION

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Project construction would begin after the appropriate federal, state, and local permits and approvals are issued. The applicant will also need to acquire property rights-of-way, complete soil investigations, and develop the final detailed design.

A construction schedule will be developed and based on permit conditions, system loading issues, existing transmission line outage restrictions, weather, road restrictions, mitigation or impact minimization, and availability of work force and materials.

### 4.1 Transmission Line and Substation

Construction of the transmission line will include installation of new single pole steel structures, removal of the existing 69 kV poles, installation/removal of safety structures at road and other utility crossings, and stringing of new conductor for the 115 kV circuit. Construction will require the acquisition and preparation of rights-of-way required for the transmission line, establishment of work and staging areas, and stringing setup sites. In some cases, temporary lay down areas may be required due to problematic structure location. Should the temporary lay down areas fall outside the right-of-way, temporary easements would be arranged with the affected landowner.

The transmission line structures are typically designed for the specific site location at which they are to be constructed; therefore, grading would typically not be required except to provide a level area for access and construction activities. Structures are typically loaded from a designated staging area and delivered to the determined field location for installation. Transmission line, associated structures, and other related construction materials are delivered, sorted, and stored at the staging locations throughout the duration of the project.

Generally, structures are assembled on the ground within the right-of-way at the respective location and a bucket truck or crane is used to lift the poles into place. The structures are erected by directly embedding the pole into an excavation roughly three to four feet greater than the pole diameter. The excavation is backfilled with native soils, gravel/crushed rock, or concrete depending on design specifications. In areas of poor soil strength and for angle and dead-end structures, a rock-filled galvanized steel culvert or drilled pier concrete foundation may also be inserted for additional stability. Support cables (guying) may be used for angle structures. In some cases an angle structure may require a pier foundation drilled approximately 15 to 30 feet below grade and backfilled with concrete.

Once structures have been erected, conductors are installed by establishing stringing setup areas within the rights-of-way approximately every two miles. Conductor stringing operations require brief access to each structure to secure the conductor wire to the insulators or to shield wire clamps once final sag is established. During this stage, avian flight diverters would typically be installed according to Minnesota Department of Natural Resources requirements. Temporary guards or clearance poles would be installed at crossings to provide adequate clearance over other utilities including streets, roads/highways, and railroads.

The proposed West New Ulm substation would be constructed on approximately 11.5 acres of land and enclosed by a perimeter fence for security. A new driveway would be installed to service the substation and a stormwater retention pond would be constructed on-site to address potential stormwater runoff from the graded substation area. The site location will likely require grading prior to construction.

Typical construction equipment used on transmission projects includes 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 are transported on tractor-trailers.

Access to the proposed transmission line right-of-way corridor would typically be made directly from existing roads or trails that run parallel or perpendicular to the transmission line right-of-way. In some situations, to accommodate heavy equipment used in construction, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed where no current access is available or the existing access is inadequate to cross roadway ditches. The applicant would notify the landowner and make arrangements prior to entering property for construction related activities, even where existing easements exist.

## **4.2 Cleanup and Restoration**

Practices to mitigate potential construction impacts will follow permit requirements and be based on construction schedules, geology and topography, maintenance guidelines, inspection procedures, and presence of sensitive environments or species.

Construction and mitigation best practices have been developed by Xcel from experience with past projects, consultation with respective federal, state, and local agencies, and affected property owners. Modifications are made throughout the construction process to ensure that potential impacts are minimized to the greatest extent.

Construction and post-construction reclamation activities include but are not limited to removing and disposing of debris; dismantling staging areas and temporary workspace; employing erosion control blankets with embedded seeds, silt fences, hay bales, or hydro seeding; and hand-planting disturbed areas with native vegetation.

Landowners will be contacted at the close of construction activities to determine whether damages due to transmission line construction have occurred. Areas damaged during construction activities (crops, fences, drain tiles, fences) will be restored to their pre-construction condition to the extent possible or the applicant may reimburse the landowner for damages sustained. Upon completion of construction cleanup and restoration of damaged areas, landowners will be sent a final letter requesting notification of any outstanding construction damage that has not been remedied.

### 4.3 Maintenance Procedures

Transmission lines and substations typically require only moderate maintenance and are designed to operate for decades. However, regular maintenance and inspections are performed over the life of the facility to ensure its continued integrity.

Monthly inspections of the transmission facilities are usually performed by air. Periodic access to the transmission line rights-of-way and substation will be required to perform on-ground inspections and conduct routine maintenance or repair. Inspections will be limited to the acquired right-of-way and/or areas where obstructions or terrain require access off the easement.

The applicant will conduct vegetation surveys and remove undesired vegetation that may interfere with the operation of the transmission line. Typical vegetation maintenance for a 115 kV transmission line is performed on a three to seven year cycle and depends on the setting. Vegetation management typically includes a combination of mechanical and hand clearing, along with possible herbicide application to remove or control the growth of vegetation in some areas.

The substations will require periodic maintenance to ensure proper operation and adherence to the National Electric Safety Code Standards (NESC). This may include servicing of transformers, circuit breakers, batteries, relays, and other equipment per the manufacturer's recommendations. The substation must also be kept free of vegetation and maintained for adequate drainage.

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## **5.0 REGULATORY FRAMEWORK**

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In Minnesota, no person may construct a high-voltage transmission line without a route permit from the PUC under Minnesota Statute 216E.03, subdivision 2. A high-voltage transmission line is defined as any conductor of electric energy and associated facilities designed for and capable of operating at a voltage of 100 kV or more and is greater than 1,500 feet in length. Associated facilities include, but are not limited to, insulators, towers, substations, and terminals.

### **5.1 Certificate of Need**

The proposed project is less than 10 miles in length and does not cross state borders; therefore, it does not qualify as a "large energy facility" under Minnesota Statute 216B.2421, subdivision 2(3) and a certificate of need is not required.

### **5.2 Route Permit**

The project is eligible for consideration under the alternative permitting process (Minnesota Rule 7849.5500) of the Power Plant Siting Act (Minnesota Statute 216E.04, subdivision 2). The alternative permitting process is shorter than the full permitting procedures and does not require the applicant to propose any alternative sites or routes to the preferred site or route, but does require the applicant to disclose rejected route alternatives and an explanation of why they were rejected. Under the Alternative Permitting Process, the Commission has six months to issue a route permit from the date a route permit application is deemed complete.

The applicant filed a route permit application with the Commission for the West New Ulm to Fort Ridgely project on August 29, 2008. The Commission accepted the route permit application as complete on October 6, 2008.

### **5.3 Scoping and Environmental Assessment**

An environmental assessment (EA) must be prepared for all projects being reviewed under the alternative permitting process. The EA contains information on the human and environmental impacts of the proposed project. It also addresses required methods to mitigate such impacts for all of the routes considered. The EA is the only state environmental review document required to be prepared for this project. The procedures EFP staff must follow in preparing the environmental assessment are described in Minnesota Rule 7849.5700.

On November 19, 2008, a public meeting on this project was held in New Ulm, as required by Minnesota Rule 7849.5570. This meeting provided the public with an opportunity to learn about the proposed project, to suggest other route alternatives, and to identify additional issues and concerns that should be considered by EFP staff in preparing the EA.

The OES accepted comments on the scope of the environmental assessment until December 5, 2008. After consideration of the public comments, the Director of the OES issued the scope of the EA on December 19, 2008. The EA scoping decision document is included in Appendix A.

Upon completion of the EA, continuing procedural steps include: providing notice on the availability of the EA, scheduling and providing notice of a public hearing in the area where the project is located, and bringing the matter or final record to the Commission for a final decision.

Copies of the route permit application and other documents relevant to the process are available for viewing and download on the PUC website at: <http://energyfacilities.puc.state.mn.us/Docket.html?Id=19744> or eDockets at <https://www.edockets.state.mn.us/EFiling/search.jsp> (Docket 08-956).

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## 6.0 POTENTIAL IMPACTS AND MITIGATIVE MEASURES

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The construction of a transmission facility involves both short- and long-term impacts. An impact is a change to the pre-construction environment as a direct or indirect result of the proposed action and may be positive or negative. Direct impacts are caused by the action and occur at the same time and place. Indirect impacts are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable.

This section describes the potential impacts on resources and the possible mitigation measures intended to minimize impacts caused by the construction and future operation and maintenance of the proposed transmission facility.

### 6.1 Environmental Setting

The proposed project is located in Brown and Nicollet counties, north and northwest of the city of New Ulm, Minnesota. The project area extends west and southwest from Lafayette Township, Nicollet County, across the Minnesota River to Milford Township, Brown County, where the newly proposed West New Ulm Substation would be located. The transmission line rebuild and construction would connect the existing Fort Ridgely substation to the newly proposed West New Ulm substation.

The proposed West New Ulm substation and most of the existing transmission line are located in primarily agricultural areas. A small area of project is located in the city of New Ulm, classified as industrial and residential, and another portion is located in the Minnesota River basin.

The project is located within the Minnesota River Prairie Ecological Subsection of the Prairie Parkland Ecological Province. This large subsection is divided north and south by the Minnesota River and is spotted with a large number of shallow lakes. Historically vegetation consisted of tall grass prairies and floodplain forests. Row-crop agriculture and pasture is the predominant land use in this subsection today.

Located in the Western Groundwater Province, the area is comprised of 100 to 400 feet of clayey glacial drift overlying Cretaceous and Precambrian bedrock. Moderate to limited surficial and buried sand and sandstone aquifers consist within the glacial drift and Cretaceous bedrock, respectively.<sup>3</sup> Soil is typically a well-drained loamy soils with select areas of clayey and sand and gravelly soils.<sup>4</sup>

The Minnesota River Prairie subsection is drained by small rivers and streams that eventually empty into the Minnesota River. The drainage network, however, is poorly developed due to landscape characteristics.<sup>5</sup> Except for the Minnesota River valley, the area is relatively level land ranging in elevation between 750 to 1,000 feet above mean sea level.

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<sup>3</sup> Minnesota Department of Natural Resources, Groundwater Provinces, <<http://www.dnr.state.mn.us/groundwater/provinces/index.html>> (accessed February 2009).

<sup>4</sup> Minnesota Department of Natural Resources, Ecological Classification System, <<http://www.dnr.state.mn.us/ecs/251ba/index.html>> (accessed February 2009).

<sup>5</sup> Ibid.

## 6.2 Socioeconomics

The population of New Ulm, the largest city in the project area, was 13,594 in 2000.<sup>6</sup> The total land area of New Ulm is 8.8 square miles in size which equates to a population density of approximately 1,510 people per square mile. The 1999 median annual household income in New Ulm was \$40,044; below the reported state median of \$47,111.<sup>7</sup>

The 2000 population of Milford Township was 793, with a total land area of 39.2 square miles.<sup>8</sup> This correlates to a population density of approximately 0.05 people per square mile. The 1999 median annual household income in Milford Township was \$57,813; above the overall state median.<sup>9</sup>

Lafayette Townships population was 724 in 2000, with a total land area of 50.4 square miles.<sup>10</sup> This correlates to a population density of approximately 0.07 people per square mile. The 1999 median annual household income in Lafayette Township was \$51,319; above the overall state median.<sup>11</sup>

Construction of the project should result in short-term positive economic impacts in the form of increased spending on lodging, meals and other consumer goods and services by contractors and employees. It is not anticipated that the project will create new permanent jobs.

There will also be some long-term beneficial impacts from the new transmission facilities. These benefits include an increase to the county's tax base resulting from the incremental increase in revenue from utility property taxes. The availability of reliable power in the area will have a positive effect on local businesses and the quality of services provided to the general public.

Socioeconomic impacts resulting from the project will be primarily positive, with increased tax revenue and an influx of wages and expenditures made at local businesses during construction.

## 6.3 Human Settlement

The proposed transmission line route is located in Lafayette Township, Nicollet County, and Milford Township, Brown County, traveling across the Minnesota River and the north end of the city of New Ulm. The main thoroughfares in the area of the project are U.S. Highway 14 and County Highway 12.

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<sup>6</sup> U.S. Census Bureau, <<http://factfinder.census.gov>> (accessed February 2009).

<sup>7</sup> Ibid.

<sup>8</sup> U.S. Census Bureau, Table DP-1. Profile of General Demographic Characteristics: 2000. Geographic Area: Milford township, Brown County, Minnesota. < [http://govpubs.lib.umn.edu/census/profile\\_twp.phtml](http://govpubs.lib.umn.edu/census/profile_twp.phtml) > (accessed February 2009).

<sup>9</sup> Ibid.

<sup>10</sup> U.S. Census Bureau, Table DP-1. Profile of General Demographic Characteristics: 2000. Geographic Area: Lafayette township, Nicollet County, Minnesota. < [http://govpubs.lib.umn.edu/census/profile\\_twp.phtml](http://govpubs.lib.umn.edu/census/profile_twp.phtml) > (accessed February 2009).

<sup>11</sup> Ibid.

The proposed 115 kV route would be designed to accommodate an existing 69 kV transmission line on the same structure and follow that alignment for 90 percent of the proposed route. The closest residence to the existing 69 kV transmission alignment is a rural residence located in north Milford Township that is approximately 35 feet from the conductors. The current 69 kV alignment also travels the length of 23rd North Street, a high-density residential area. There are 15 residential structures on 23rd North Street that sit between 41.5 to 67 feet from the existing 69 kV conductors.<sup>12</sup>

### 6.3.1 Displacement

The applicant indicates in the route permit application that no displacement of residential homes or business is anticipated to occur as a result of this project.

### 6.3.2 Noise

Noise is measured in units of decibels (dB), or sound pressure level. The sound pressure level for purposes of human hearing is measured with the A-weighted decibel scale or dB(A). Potential noise associated with the proposed project include sources associated with initial construction and long-term operation of the proposed project.

Short-term exceedance of daytime noise standards would be intermittent and temporary in nature. Impacts from general construction noise are expected to occur during daytime hours as the result of heavy equipment operation and increased vehicle traffic associated with the transport of construction personnel to and from the work area.

Long-term operational noise would be associated with the insulators, transmission conductor hardware, and transformers at the substations. The level of noise is dependent upon the conductor conditions, voltage levels and weather conditions. Conductors and transformers may create subtle crackling noise due to the electric ionization of moist air near the wires when it is rainy, damp, or foggy (corona discharge, see Sections 6.9 and 6.14).

Estimated  $L_5^\dagger$  audible noise calculations provided by Xcel indicate the noise level at 50 feet from the center of the transmission alignment would approach a maximum of 7.8 dB(A) for the 115/69 kV double circuit segment and 4.8 dB(A) for the 115 kV single-circuit (Table 3). By comparison, a library setting is typically referenced at 50 dB(A).<sup>13</sup> The most stringent noise standard in Minnesota is the residential nighttime standard of 50 dB(A)  $L_{10}^\dagger$ .

<sup>12</sup> Xcel Energy email, Table 1 Attachment, December 17, 2008.

<sup>†</sup>  $L_5$  is the dB(A) that may be exceeded 5 percent of the time within one hour.  $L_{10}$  is the dB(A) that may be exceeded 10 percent of the time within one hour.

<sup>13</sup> Minnesota Pollution Control Agency, A Guide to Noise Control in Minnesota, Acoustical Properties, Measurement, Analysis and Regulation (2008).

**Table 3: Calculated Audible Noise of Proposed Transmission Line Project<sup>14</sup>**

Structure Type	50 feet from Centerline in dB(A) L <sub>5</sub>	50 feet from Centerline in dB(A) L <sub>50</sub>
Davit Arm 115 kV Steel Pole Single Circuit	4.8	1.3
Davit Arm 115/69 kV Steel Pole Double Circuit	7.8	4.3

L<sub>5</sub> is the dB(A) that may be exceeded 5 percent of the time within one hour. L<sub>50</sub> is the dB(A) that may be exceeded 50 percent of the time within one hour.

### 6.3.3 Aesthetics - Visual Impacts

Aesthetics refer to the natural and human modified landscape features or visual resources that contribute to the public's experience and appreciation of the environment. Wetlands, surface waters, landforms, forests and vegetation patterns are among the natural landscape features that define an area's visual character, whereas buildings, roads, bridges and other structures reflect human modifications to the landscape. The level of impact to visual resources generally depends on the sensitivity and exposure of a particular viewer and can vary greatly from one individual to the next. It is, therefore, difficult to predict whether a transmission line project would alter the perceived visual character of the environment and constitute a negative visual impact.

There are 15 residential structures located along 23rd North Street from North Broadway Street, through Terrace Drive North to Boundary Street. Nine are located on the south side of 23rd North Street and the remaining six are located on the north side. There is one multi-tenant facility (720 23rd North Street) and at least one duplex.<sup>15</sup> The current alignment of the existing 69 kV transmission line places the conductors at approximately 41.5 to 67 feet from residential structures along 23rd North Street.<sup>16</sup> The 69 kV line has historically been located in this area as currently configured since the 1920's, prior to residential construction, as indicated by the applicant.

Replacing the existing 69 kV distribution line with a double-circuit 115/69 kV line in the existing utility right-of-way would have an incremental impact on visual resources since an existing line already occupies the area. That is, the new transmission poles would be taller than the existing and would allow for greater span lengths that may translate to fewer poles along 23rd North Street. Depending on final structure design, the new conductor, when compared to the existing 69 kV line, would be positioned 4 to 6 closer to the homes along 23rd North Street, but may also be placed higher off the ground due to the increased pole height.

<sup>14</sup> Xcel email, February 13, 2009.

<sup>15</sup> Xcel Email, December 18, 2008.

<sup>16</sup> Ibid.

A comment letter from New Ulm Public Utilities received during scoping and included in the scoping decision suggested looking at the possibility of placing the route segment proposed along 23<sup>rd</sup> Street underground. A revised pole design and placement that would maintain the existing distance of the 69 kV line from the front property lines along 23<sup>rd</sup> Street and allow for sidewalk installation was also recommended. These suggestions are discussed below as possible mitigation measures for the proposed project.

### Mitigative Measures

The proposed transmission line and structures will add to the changing landscape of the area. In an effort to mitigate the potential visual impacts from the transmission project the applicant is proposing to use existing road and utility rights-of-way and maximize setbacks from homes to the greatest extent practicable. Potential mitigation measures proposed by the applicant include:

- Input pertaining to visual impacts from landowners or land management agencies will be considered prior to final location of structures, rights-of-way, and other areas with the potential for visual disturbance.
- Care will be used to preserve the natural landscape and prevent any unnecessary destruction of the natural surroundings in the vicinity of the project during construction and maintenance.
- Wetlands, lakes, and surface flows will be crossed in the same location as existing transmission lines.
- New structures will be designed to support the underbuild of the existing 69 kV line, thereby allowing the use of existing alignments where feasible and will share existing road rights-of-way to the extent that such actions do not violate sound engineering principles or system reliability criteria.
- Structures will be placed at the maximum feasible distance from intersecting roads, highway, or trail crossings and could cross roads to minimize or avoid impacts.

In addition, the Commission could require, as a permit condition, that Xcel work with landowners to identify issues related to the transmission line such as distance from existing structures, tree clearing, and other aesthetic concerns, should a route permit be issued for the proposed project. An example of a route permit is presented in Appendix B.

### **Transmission Structure Design Options along 23rd North Street Segment**

Comment letters received from residents living along 23rd North Street indicate concern that, if permitted and constructed as proposed, the new transmission conductors would be even closer to their homes than the existing 69 kV line already is. Again the current 69 kV conductors are approximately 41.5 to 67 feet from homes along 23rd North Street. The route permit application indicates that the proposed 115/69 kV double circuit structures would position the new conductor approximately 4 to 6 feet closer, or 36 to 61 feet from the existing homes along 23rd North Street.

In response to these comments Xcel revisited the proposed structure design and found that it would be feasible to engineer the new arms/posts. The revised structure design would increase the distance between the conductors and existing homes along 23rd North Street by three feet over the proposed design. That said, the conductors would still be positioned approximately 1 to 3 feet closer to homes when compared to the existing 69 kV line. A table provided by Xcel indicating the existing and proposed measurements to homes along 23rd North Street is presented in Appendix C.

The applicant has also indicated that the new structures would also be designed to utilize the existing 50 foot right-of-way. In contrast to the existing 69 kV poles, the new poles would be taller and have an average span of 325 feet between poles. Xcel would work with homeowners/landowners during final design to determine optimal pole locations (i.e. property boundaries or offset from house frontages), if feasible.

### **Underground Construction along 23rd North Street Segment**

Comment letters received from residents living along 23rd North Street and one letter from New Ulm Public Utilities suggested the option of burying or undergrounding the proposed 115/69 kV double-circuit line for the segment that runs along 23rd North Street from Boundary Street to Broadway. The reasoning for this suggested engineering/design alternative is to mitigate any perceived aesthetic impacts that the proposed double-circuit line may have to the residents along 23rd North Street. Underground transmission lines are briefly discussed below.

#### Construction

In general, there are three major types of underground transmission facilities: high- and low-pressure oil filled systems, solid dielectric, and compressed gas insulated systems. Installation includes direct bury in backfilled trenches and concrete trenches with covers or concrete ductbanks.

Constructing the trench for the underground transmission line would result in greater temporary construction impacts than the proposed overhead line. A typical progression rate for underground construction would be two to three days for each 200-foot section of trench. Approximately 500 to 700 feet of trench is open at one time. Steel plates are typically placed over open sections of trench when crews are not at that location. Access to homes (driveways, front yards, sidewalks, and street parking) along 23rd North Street would be limited for several days to weeks during construction and local traffic would likely be rerouted to other streets, or redirected by a traffic monitor to one direction at a time along 23rd North Street.

Underground transmission construction as compared to overhead lines increased noise, dust, and traffic disruption.

#### EMF

Electric fields created by transmission lines can be blocked by different objects such as trees, structures, cars, and soil, therefore, electric fields may be significantly diminished by undergrounding transmission lines.

The magnetic field of an underground transmission is determined by many factors including the type/design of underground transmission facility along with the maximum voltage. Magnetic fields are however difficult to block and will continue to pass through the ground. Regardless of overhead or underground construction, magnetic and electric field intensity decreases with distance.

#### Economic Analysis

The following tables provide the estimated cost of constructing the proposed project as compared to the cost of undergrounding the segment of the route that would run along 23rd North Street (0.26 miles).

**Table 4: Cost Estimates for Undergrounding Segment Along 23rd North Street**

Option	Description	Total Cost	Difference from Proposed
Proposed	Double-circuit 115/69 kV overhead	\$300,000	NA
A	115 kV overhead and 69 kV underground	\$1,800,000	\$1,500,000
B	69 kV overhead and 115 kV underground	\$4,200,000	\$3,900,000
C	Underground 69 kV and 115 kV	\$4,700,000	\$4,400,000

Undergrounding both the proposed 115 kV and the existing 69 kV along 23rd North Street would add an estimated \$4.4 million to the \$14.5 million base cost of the project as proposed. Additional cost information provided by the applicant is included in Appendix C.

#### Maintenance

Though rare, one major disadvantage of building underground transmission lines is the difficulty of finding and repairing failures. It can be difficult to determine the location of a failure on an underground line. Overhead failures can usually be found through visual inspection. And while overhead failures can usually be repaired in hours or days, repair on an underground system can be more complex. Underground cable failures must first be located, then excavated and repaired. These excavated repairs can take weeks or months, depending on the extent of damage and the availability of replacement materials, so there could be significant impacts to traffic and residences adjacent to the excavation. Thus the cost for continued maintenance on an underground line compared to an above ground line is significantly higher.

This mitigative measure would eliminate the existing overhead transmission structures along 23rd North Street, if both lines were buried. Placing the proposed 115/69 kV transmission line underground along the 23rd North Street segment would result in a more “uncluttered” viewshed for existing residents, which would likely be perceived as a positive aesthetic impact. However, it is unclear whether this would translate into a positive economic impact to property values.

To receive the full benefit of this suggested mitigative measure, both the existing 69 kV and the proposed 115 kV would need to be placed underground. Burying only the proposed 155 kV transmission line would have limited impacts on the viewshed of 23<sup>rd</sup> Street residents because the existing 69 kV line and structures would remain as is.

## 6.4 Public Health and Safety

The transmission line, regardless of route location, must meet all requirements of the National Electrical Safety Code (NESC) and the Rural Utilities Service (RUS) Design Manual for High Voltage Transmission Lines. These standards are designed to protect human health and the environment. They also ensure that the transmission line and all associated structures are built from high quality materials that will withstand the operational stresses placed upon them over the expected lifespan of the equipment provided normal routine operational and maintenance is performed.

Utilities must comply with the most recent edition of the National Electric Safety Code, as published by the Institute of Electrical and Electronics Engineers, Inc., and approved by the American National Standards Institute, when constructing new facilities or reinvesting capital in existing facilities. See Minnesota Statute 326B.35 and Minnesota Rule 7826.0300 subpart 1.

The NESC is a voluntary utility developed set of standards intended to ensure that the public is protected. The NESC covers electric supply stations and overhead and underground electric supply and communication lines, and is applicable only to systems and equipment operated by utilities or similar systems on industrial premises. For more information, go to [standards.ieee.org/faqs/NESCFAQ.html#q1](http://standards.ieee.org/faqs/NESCFAQ.html#q1). The RUS provides leadership and capital to “upgrade, expand, maintain, and replace America's vast rural electric infrastructure.” For more information, go to <http://www.usda.gov/rus/electric/index.htm>.

Standards would be met for, but not limited to, clearance to ground, clearance to crossing utilities, clearance to buildings, right-of-way widths, erection of power poles, and stringing of transmission line conductors. All applicable safety procedures would be followed during and after installation. The proposed transmission lines would be equipped with protective devices to safeguard the public from the transmission lines if an accident should occur and a structure or conductor would fall to the ground. The protective equipment would de-energize the line should an event occur. In addition, the substation facilities would be fenced and access limited to authorized personnel.

### 6.4.1 Electric and Magnetic Fields

Electric and magnetic fields arise from the voltage and the flow of electricity (current) through a conductor. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the electric current. The electric field associated with high voltage transmission lines “extend” from the energized conductors to other nearby objects whereas the magnetic field “surrounds” the conductor. Together, these fields are generally referred to electric and magnetic fields or EMF. A summary of electric and magnetic properties is summarized in Table 5.

This section of the EA specifically addresses electric and magnetic fields produced through transmission of electric power at 60 Hz (cycles per second), also referred to as power frequency EMF. Transmission lines, household appliances and electric equipment, lighting and wiring all create electric and magnetic fields.

**Table 5: Summary of Electric and Magnetic Field Properties**<sup>17</sup>

<b>Electric Fields</b>	<b>Magnetic Fields</b>
Electric fields arise from voltage.	Magnetic fields arise from current flows.
Their strength is measured in volts per meter (V/m).	Their strength is measured in amperes per meter (A/m). Commonly, EMF investigators use a related measure, flux density (in microtesla ( $\mu$ T) or millitesla (mT) instead.
An electric field can be present even when a device is switched off.	Magnetic fields exist as soon as a device is switched on and current flows.
Field strength decreases with distance from the source.	Field strength decreases with distance from the source.
Most building materials shield electric fields to some extent.	Magnetic fields are not attenuated by most materials.

### ***Electric Fields***

Electrical fields are created by voltage. Voltage can be described as the potential difference between two points and will always try to drive an electric current. The voltage on any conductor produces an electric field that extends from the wire in all directions. The intensity of electric fields is associated with the voltage of the transmission line and is measured in kilovolts per meter (kV/m). Some typical electric field strengths measured near common household appliances are presented in Table 6.

**Table 6: Typical Electric Fields (V/m) from Common Home and Business Appliances**<sup>18</sup>

<b>Source</b>	<b>Electric Field Strength (at a distance of 30 cm)</b>
Iron	120
Refrigerator	120
Toaster	80
Coffee machine	60
Vacuum cleaner	50

<sup>17</sup> World Health Organization, "What are Electromagnetic Fields?", *Health and Environment Briefing Pamphlet, Series 32* (1999).

<sup>18</sup> Ibid.

Transmission line electric field levels are typically greatest near the center of the line right-of-way with levels decreasing as one moves away from the central alignment. The electric field associated with a high voltage transmission line may extend from the energized conductors to other nearby objects such as the ground, towers, vegetation, buildings, and vehicles. These objects are commonly referred to as “screeners”. The screening effect associated with these and other objects reduce the strength of transmission line electric fields.

Electrical fields at maximum conductor voltage for the proposed project are presented in Table 7. Maximum conductor voltage is defined as the nominal voltage plus 5 percent, or 121 kV.

**Table 7: Calculated Electric Fields (kV/m) for Proposed Transmission Line (3.28 feet above ground)<sup>19</sup>**

Structure Type	Maximum Operating Voltage*	Distance to Proposed Centerline (feet)										
		-300	-200	-100	-50	-37.5	0	37.5	50	100	200	300
Steel Pole Davit Arm 115 kV Single Circuit	121 kV	0.01	0.02	0.12	0.55	0.89	1.17	0.72	0.4	0.08	0.02	0.01
Steel Pole Davit Arm 115/69 kV Double Circuit	121/72.5 kV	0.01	0.01	0.03	0.06	0.11	1.35	0.30	0.06	0.06	0.02	0.01

\*Maximum operating voltage is the nominal voltage plus five percent (i.e. 115 kV + 5.75 = 121 kV).

The applicant has stated that the proposed 115 kV transmission line would have a maximum electric field density of approximately 1.17 kV/m, at centerline, one meter above the ground. While the 115/69 kV double circuit transmission line segment would have a maximum electric field density of 1.35 kV/m, at centerline, one meter above the ground.

The maximum electric field of 1.35 kV/m is approximately 83 percent less than the 8 kV/m guideline historically recommended by the Minnesota Environmental Quality Board (EQB) and PUC in other route permit proceedings. The 8 kV/m guideline was designed to prevent serious hazard from shocks when touching large objects like a bus or combine parked under high voltage transmission lines, usually of 345 kV or greater.

<sup>19</sup> Northern States Power Company, Application to the Minnesota Public Utilities Commission for a Route Permit, West New Ulm - Fort Ridgely 115/69 kV Transmission Line Rebuild Project (August 29, 2008).

**Magnetic Fields**

Electric current passing through a conductor produces a magnetic field in the area surrounding the wire. Similar to electric fields, magnetic fields are strongest near the conductor and diminish with distance. Magnetic fields, however, are not shielded by most common materials and easily pass through them. The magnetic field may also be called magnetic flux density (or magnetic induction) and is measured in units of milligauss or microtesla.

The estimated magnetic fields based on the proposed line and structure designs are presented in Table 8. The expected magnetic fields for the structure type and voltage have been calculated at various distances from the centerline.

**Table 8: Calculated Magnetic Flux Density in Milligauss (mG) for Proposed Transmission Line (3.28 feet above ground)<sup>20</sup>**

Structure Type	System Condition	Current (Amps)	Distance to Proposed Centerline (feet)										
			-300	-200	-100	-50	-37.5	0	37.5	50	100	200	300
Steel Pole Davit Arm 115 kV Single Circuit	Peak	326	0.49	1.07	5.04	13	19.58	55.13	20.86	13.51	3.87	0.97	0.42
	Average	196	0.30	0.64	2.38	7.81	11.77	33.15	12.54	8.12	2.33	0.58	0.25
Steel Pole Davit Arm 115/69 kV Double Circuit	Peak	201/335	0.23	0.54	2.35	9.12	14.40	35.36	5.77	3.11	0.86	0.31	0.16
	Average	121/201	0.13	0.31	1.39	5.44	8.61	21.25	3.45	1.83	0.49	0.17	0.09

Magnetic fields are not singularly associated with transmission lines. People are exposed to varying magnetic fields to a greater or lesser extent throughout each day whether at home or in schools and offices. A U.S. government study conducted by EMF Research and Public Information Dissemination Program determined that most people in the United States on average are exposed to magnetic fields of 2 mG or less daily, and varies by individual.<sup>21</sup> Median magnetic field readings for a select number of common home and business appliances are presented in Table 9.

<sup>20</sup> Northern States Power Company, Application to the Minnesota Public Utilities Commission for a Route Permit, West New Ulm - Fort Ridgely 115/69 kV Transmission Line Rebuild Project (August 29, 2008).

<sup>21</sup> The National Institute of Environmental Health Science. *Electric and Magnetic Fields Associated with the Use of Electric Power*, (June 2002): 34-36.

**Table 9: Typical Magnetic Fields (milligauss) from Common Appliances**<sup>22</sup>

Source	Distance from Source			
	0.5 foot	1 foot	2 feet	4 feet
Baby Monitor	6	1	-	-
Computer Displays	14	5	2	-
Fluorescent Lights	40	6	2	-
Copy Machines	90	20	7	1
Microwave Ovens	200	4	10	2
Electric Pencil Sharpeners	200	70	20	2
Vacuum Cleaner	300	60	10	1
Can Opener	600	150	20	2
Color Televisions	NA	7	2	-

There are currently no state or federal exposure standards for magnetic fields. Florida and New York are the only two states in the country that have set standards for magnetic field exposure (150 mG limit in Florida and 200 mG limit in New York). These exposure limits were not based on scientific analysis, but in response to maintaining transmission systems within historic levels.

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has developed occupational and residential guidelines for EMF exposure (see Table 10 below). They have also concluded that available data regarding potential long-term effects, such as increased risk of cancer, are insufficient to provide a basis for setting exposure restrictions.

The maximum estimated electric field generated by the project is 1.35 kV/m. This level is approximately 68 percent less than the 4.2 kV/m ICNIRP developed guidelines for the general public. The maximum peak estimated magnetic field generated by this project is 55.13 mG which is approximately 93 percent less than the 833 mG ICNIRP developed guidelines for the general public.

**Table 10: Voluntary Exposure Guidelines for EMF ICNIRP Guidelines for 60 Hz EMF Exposure**<sup>23</sup>

Exposure	Electric Field (kV/m)	Magnetic Field (mG)
Occupational	8.3	4,200
General Public	4.2	833

<sup>22</sup> The National Institute of Environmental Health Science. *Electric and Magnetic Fields Associated with the Use of Electric Power*, (June 2002): 34-36.

<sup>23</sup> Ibid. 13: 47.

### Mitigative Measures

Research on the effects of electric and magnetic fields to human health have been studied and debated since the 1970's. Conclusions have ranged from no significant association between exposure to EMF and health effects to a weak association between the two. A number of national and international health agencies (The Minnesota Department of Health, The World Health Organization, The National Institute of Environmental Health Sciences) have generally concluded in their research that there is insufficient evidence to prove a connection between EMF exposure and health effects. Research has not been able to establish a cause and effect relationship between exposure to magnetic fields and human disease, nor a plausible biological mechanism by which exposure to EMF could cause disease.

In Fact Sheet, WHO/322, *Electromagnetic Fields and Public Health: Exposure to Extremely Low Frequency Fields*, June 2007, The World Health Organization provided an update. In many studies, a weak, statistical link between exposure to EMF and incidence of childhood leukemia has been noted. Additionally, some epidemiologic studies making a regression analysis of leukemia cases have found a statistical association. A similar link has not been noted with other types of cancer. In its report, after reviewing recent studies, The World Health Organization concludes that laboratory evidence does not support these findings:

*... epidemiological evidence is weakened by methodological problems, such as potential selection bias. In addition, there are no accepted biophysical mechanisms that would suggest that low-level exposures are involved in cancer development. ... Additionally, animal studies have been largely negative. Thus, on balance, the evidence related to childhood leukaemia is not strong enough to be considered causal. ... Regarding long-term effects, given the weakness of the evidence for a link between exposure to ELF [extremely low frequency] magnetic fields and childhood leukaemia, the benefits of exposure reduction on health are unclear.*

Although scientists are still debating whether EMF is a hazard to health, at the current time in the United States, there are no federal standards for occupational or residential exposure to EMF.

The following resource provides additional information regarding electric and magnetic fields: *Electric and Magnetic Fields Associated with the Use of Electric Power*, The National Institute of Environmental Health Sciences, June 2002, and can be found on the internet at: <http://www.niehs.nih.gov/health/topics/agents/emf/docs/emf2002.pdf>.

To assist the public in understanding this issue, Xcel will provide information to the public, interested customers and employees. The information may reference studies and provide data to help explain the relative impact of transmission line exposure to other common EMF exposures, and allow individuals to make informed decisions regarding EMF.

The applicant will use structure designs that minimize magnetic field levels. This may include placement of transmission structures near the shared property line boundaries or areas between homes so as not to be placed directly in front of a home. The transmission structures may also be designed keep the conductors at the maximum allowable distance from residential structures. Access to the proposed substation will be restricted by fences or barriers.

Xcel will provide measurements (i.e. distances from transmission lines, substations, and associated equipment) for landowners, customers and employees who request them.

#### 6.4.2 Pacemakers

Research has established that EMF can potentially interfere with cardiac pacemakers and implantable cardioverter defibrillators under certain circumstances. Electric and magnetic fields may interfere with an implanted cardiac device's ability to sense normal electrical activity in the heart if the electric field intensity is high enough to induce body currents strong enough to cause interaction. Modern bipolar devices are much less susceptible to interactions with electric fields. Medtronic and Guidant, manufacturers of pacemakers and implantable cardioverter defibrillators, have indicated that electric fields below 6 kV/m are unlikely to cause interactions affecting operation of most of their devices. Older unipolar designs are more susceptible to interference from electric fields. Research suggests that the earliest evidence of interference occurred in electric fields ranging from 1.2 to 1.7 kV/m.

#### Mitigative Measures

The estimated electric fields for this project (Table 7) are below levels at which modern bipolar and older unipolar devices are susceptible to interaction. In the unlikely event a pacemaker is impacted, the effect is typically a temporary asynchronous pacing (commonly referred to as reversion mode or fixed rate pacing). The pacemaker would return to its normal operation when the person moves away from the source of the interference. Individuals using such devices should consult with their doctor regarding recommended precautions or avoidance. The interference of a cardiac pacemaker implant by high voltage transmission line electric and magnetic fields cannot be excluded, but the risk of the interference inhibition in everyday life is small. No mitigation is necessary.

#### 6.4.3 Stray Voltage

Electrical supply systems delivering power to farms, homes, and businesses are grounded to the earth to make them safe and to ensure their reliability. Grounding of these electrical supply systems results in a small amount of current moving through the earth. A small voltage called neutral-to-earth voltage may develop at each point where the electrical system is grounded. When neutral-to-earth voltage is found near animal contact points at levels considered to have potential impact on animals, it is often called stray voltage. Stray voltage is the difference in voltage measured between two points contacted simultaneously by a person or animal (typically less than 10 volts).

Stray voltage arises from poor electrical connections, deteriorated insulation, or faulty equipment. Some sources of stray voltage are cathodic protection systems, telephone systems, and direct current power lines. Stray voltage has been raised as a concern on some dairy farms because of the potential for dairy cows to come into contact with two points and provide a conducting path for current to flow, thereby impacting operations and milk production.

#### Mitigative Measures

In instances when transmission lines have been shown to contribute to stray voltage, the electric distribution system directly serving the farm/structure was directly under and/or parallel to the transmission line. These circumstances are considered when installing transmission lines and can be readily mitigated. Appropriate measures will be taken during transmission line detailed design and construction to prevent the potential for any stray voltage problems for this project. Xcel will be required to address and rectify any stray voltage problems that arise during transmission line operation.

## **6.5 Recreation**

Recreational opportunities in the area includes typical outdoor activities common to Minnesota, such as walking, biking, canoeing, hunting, fishing, and other general outdoor activities. There are no national forests, national wildlife refuges, federal waterfowl production areas, state parks, state forests, state trails, scientific and natural areas, or water access points present within the proposed project area.

Two state wildlife management areas (WMAs) are located near the proposed transmission line route. The Somsen WMA is located at the northeast corner of U.S. Highway 14 and County Highway 12 and the Fritsche Creek WMA in Nicollet County along the Minnesota River. Although the project will not directly impact these resources, the transmission line structures will likely be visible to those using either of the WMAs and the newly proposed substation would be visible from the Somsen WMA.

A bike trail managed by the city of New Ulm runs south, paralleling the DM&E railroad from North Broadway and KC Street to 20<sup>th</sup> Street South. The proposed transmission line would cross over the bike trail near the intersection of Broadway and 23rd North Street. The bike path may need to be rerouted during construction of the transmission project at this location. In addition, the line would be visible to those using the bike path in this area.

The proposed transmission line would cross an area of the Minnesota River that is a state designated canoe route. The new 115 kV transmission line will, however, be constructed along the existing Fort Ridgely 69 kV river crossing alignment using double circuit 115/69 kV structures accommodating the new 115 kV and the existing 69 kV on a single structure alignment, thereby avoiding a new crossing of the Minnesota River.

#### Mitigative Measures

There will be no impacts to recreational opportunities along the proposed route except for temporary rerouting of the bike path during the construction phase and incremental impacts due to the line size change. The applicant will work with the city of New Ulm to reroute the bike trail during transmission line construction, as necessary.

## 6.6 Transportation and Public Services

Impacts to transportation would be localized and short term. Construction will not impact the county or city water, sewer, and electric services, emergency services, or private wells and septic systems.

The New Ulm Public Utilities electric transmission system is connected to the existing Xcel 69 kV line at a switch located at the southwest corner of North Broadway and 23rd North Street. As part of the proposed project, the existing switch structure will be removed and replaced by a new switch to be relocated on the east side of North Broadway, on city-owned land.

### Mitigative Measures

All necessary provisions would be made to conform to safety requirements for maintaining the flow of public traffic. Traffic control barriers and warning devices would be used when appropriate. Construction operations would be conducted to offer the least possible obstruction and inconvenience to public traffic. The construction contractor would be required to plan and execute delivery of heavy equipment in such a manner that would avoid traffic congestion and reduce the likelihood of dangerous situations along local roadways. Xcel would work closely with Minnesota Department of Transportation (MnDOT), Brown and Nicollet counties, and the city of New Ulm to ensure minimal disruption to area traffic.

Xcel has been in discussion with New Ulm Public Utilities regarding the new switch and will work with New Ulm during construction planning to ensure coordination with the new interconnection.

## 6.7 Land Use

Zoning maps indicate the proposed transmission line route crosses land designated as Urban and Industrial, Rural Development, Cultivated, Transitional Agriculture, and Deciduous forest<sup>24</sup>. In addition, comments provided by Milford Township during the EA scoping period indicate that the proposed substation site is located in an area marked for future expansion of the city of New Ulm.

### ***Agriculture***

Agriculture plays a strong economic role in both Brown and Nicollet counties. According to the 2007 Census of Agriculture, the top crops in both counties were corn, soybeans, and beans with hogs and pigs the top livestock. The total value of agricultural products sold for 2007 in Brown and Nicollet counties was \$256,380,000 and \$236,763,000, respectively.

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<sup>24</sup> Land Management Information Center, County Land Use and Land Cover Map, Brown and Nicollet counties, <http://www.gda.state.mn.us/resource.html?Id=2518> (Accessed February 2009).

Construction of the new transmission structures and removal of existing structures will require repeated access to install foundations, structures and conductors. The applicant indicates that transmission line construction may temporarily impact approximately 4.6 acres of agriculture land. Impacts would originate from the various construction vehicles required to install the transmission line and structures, and may result in rutting and compaction of soil and farm fields. Because the new transmission line will be utilizing the existing 69 kV alignment and right-of-way, new impacts to agricultural land should be minimal and temporary in nature.

The applicant states that construction of the West New Ulm substation will result in permanent impact to all of the 11.5 acres of land required for the proposed substation. The proposed substation location is also located in an area marked for future expansion of the city of New Ulm, as indicated by Milford Township.

### ***Forestry***

There are no state forests, federal forests, or commercial forest resources located along the proposed transmission line rebuild route or at the proposed substation site.

### ***Mining***

The route permit application states that the applicant identified a private sand and gravel mine located north of 23rd North Street and adjacent to the existing 69 kV line. The operation is being conducted by M.R. Paving & Excavating, Inc. The applicant indicates they have met with M.R. Paving & Excavating and determined that the proposed transmission line project should not impact the mining operations and mining operation will not interfere with the proposed project. While no impacts to the mining operation are anticipated, Xcel would coordinate with M.R. Paving & Excavating to ensure there will be no impacts to the mining operation or line work.

### ***Airports***

The New Ulm Municipal Airport is located within the vicinity of the project. The project is not expected to impact the airport, because it entails replacing an existing 69 kV transmission line and structures. However, the applicant should review the current airport zoning documents or ordinances to ensure that the new structures comply with airport safety zones and ordinances upon completion of line design.

### **Mitigative Measures**

The transmission line project does not appear to be in conflict with any of the designated land uses in the project area. Again, the proposed 115 kV transmission line would be constructed within the existing Fort Ridgely 69 kV right-of-way using double circuit 115/69 kV structures that accommodate the new 115 kV and the existing 69 kV on a single structure alignment, thereby avoiding the need for new right-of-way.

The proposed substation would be located in an area that has been identified by Milford Township for future expansion of the city of New Ulm. However, the preliminary design of the substation, as indicated by the applicant, would place the 740 foot by 675 foot substation footprint approximately 150 feet from the U.S. Highway 14 centerline and 125 feet from the County Highway 12 centerline. The extent of the future expansion of city of New Ulm is not known at this time. The applicant should work with Milford Township and the City of New Ulm during final design to determine the most advantageous placement of the substation footprint in this area.

Construction vehicles will be limited to the existing right-of-way and/or temporary driveways created between the roadway and the structure locations using the shortest route possible. Construction mats may also be used to minimize impacts on access paths and construction areas. Furthermore, transmission line route permits generally require project related land impacts to be restored to pre-construction condition upon project completion.

The applicant will work with landowners to minimize impacts to farming operations along the proposed route, such as initiating construction before crops are planted or following harvest. Xcel will work with the property owners pre- and post construction to minimize the impact. The applicant would be required to compensate landowners for any yard/landscape damages, crop damage, soil compaction, or drain tile damage that may occur during construction, as a condition of the route permit.

Xcel will implement best management practices during construction in an effort to reduce dust, erosion, and minimize compaction. Soil erosion control best management practices will be employed to minimize loss of topsoil. Areas disturbed will be returned to their pre-construction condition. Transmission line route permits generally require use of soil erosion controls and require soils compacted by construction activities to be restored to pre-construction condition upon project completion.

Larger disturbed areas of one acre or more (proposed West New Ulm substation) will be regulated by a National Pollutant Discharge Elimination System (NPDES) permit and Stormwater Pollution Prevention Plan (SWPPP) prepared for the project. Mitigation under the NPDES includes implementation of the SWPPP with the appropriate erosion control methods developed specifically for the site. The Minnesota Pollution Control Agency (MPCA) issues combined NPDES/State Disposal System permits for construction sites, industrial facilities and municipal storm sewer systems. Compliance with the MPCA stormwater program would be a condition of the route permit.

## **6.8 Archaeological and Historic Features**

The applicant conducted a records review at the Minnesota State Historic Preservation Office (SHPO) and the Office of the State Archaeologist (OSA). The records review identified three historic architectural properties and four archaeological sites within one mile of the site, as provided in the route permit application. Properties and sites identified by the applicant are presented below in Table 11. The proposed project area has not been formally surveyed for historic and archaeological sites.

**Table 11: Historic Sites within One Mile of the Site<sup>25</sup>**

Property Type	Inventory Number	Description	National Register of Historic Places
Architectural	BW-MIL-002	Mack Farmhouse	Not Evaluated
Architectural	BW-MIL-004	House	Not Evaluated
Architectural	BW-MIL-007	School District #14	Not Evaluated
Archaeological	21BW0005	(Runck Site) Archaic, Woodland, Mississippian Habitation/Mound Site	Not Evaluated
Archaeological	21BW0007	(Runck Burial Site) Archaic Burial Site	Not Evaluated
Archaeological	21NL0062	(Fritsche Creek I Site) Middle Woodland Artifact Scatter	Eligible
Archaeological	21NL0063	(Fritsche Creek Bison Kill) Paleoindian, Middle Woodland Bison Kill Site	Eligible

### Mitigative Measures

The applicant would conduct a phase I survey of the project area surrounding the Minnesota River prior to commencing construction activities. In the event that a resource is encountered, the SHPO should be contacted and consulted; the nature of the resource should be identified; and a determination should be made on the eligibility for listing in the National Registry of Historic Places. This requirement would be carried over as a condition of the route permit if granted by the PUC.

## **6.9 Air Quality Resources**

There are minimal air quality impacts associated with transmission line construction and operation. The only potentially direct air quality issue associated with transmission lines is the production of ozone and nitrogen oxides resulting from the corona effect. The corona effect is the ionization of air in the electric field at the surface of a transmission line and may be a contributing source of audible noise, electromagnetic radiation, and chemical reactions. In this case, the chemical reactions that take place when corona is present result in minute amounts of ozone and nitrogen oxides being produced. Ozone comprises approximately 90 percent of the oxidants produced, with the remaining 10 percent composed principally of nitrogen oxides.

<sup>25</sup> Northern States Power Company, Application to the Minnesota Public Utilities Commission for a Route Permit, West New Ulm - Fort Ridgely 115/69 kV Transmission Line Rebuild Project (August 29, 2008).

Corona is an undesirable occurrence for electric transmission line facilities, as it is oftentimes caused by imperfect conductor support hardware and/or faulty insulators or cracks and separations in the line. The corona effect is cumulative, in that its presence contributes to increased deterioration of the transmission facility components and could reduce electric transmission reliability if left unchecked.

The Clean Air Act, National Ambient Air Quality Primary Standard (2008) for ozone in an area is 0.075 parts per million (ppm). Studies designed to monitor the production of ozone under transmission lines have essentially been unable to detect a significant increase in ozone from a 115 kV transmission line. Calculations referenced from the Bonneville Power Administration (BPA), *Corona and Field Effects Program Ver. 3* (U.S. Department of Energy, BPA, Undated) for a standard single circuit 115 kV transmission line project predicted the maximum ozone concentration of 0.008 ppm near the conductor and 0.003 ppm at one meter above ground during foul weather or worst case conditions. During a mist (rain at 0.01 inch per hour) the maximum concentrations decreased to 0.0003 ppm near the conductor and 0.0001 ppm at one meter above ground level. In both instances the detectable ozone levels were well below Environmental Protection Agency standards. Given this, there are no anticipated impacts relating to ozone for the proposed project.

During project construction there will be emissions and fugitive dust from vehicles and other construction related equipment. The magnitude of the construction emissions is influenced heavily by weather conditions and the specific construction activity occurring. Adverse impacts to the surrounding environment would be minimal due to the short and intermittent nature of project construction.

#### Mitigative Measures

There will be no significant impacts to air quality; therefore, no mitigation is necessary. Temporary impacts due to construction would be minimized by using best management practices to reduce dust emissions.

## **6.10 Surface Water and Wetlands**

Minnesota public waters are protected lakes, wetlands, and watercourses defined in Minnesota Statute 103G and regulated by the Minnesota Department of Natural Resources (DNR). The proposed route will cross three different public waters as identified on Public Waters Inventory (PWI) maps. These include two watercourses, the Minnesota River and Huelskamp Creek, and an unnamed marsh (08-18P) located within Somsen WMA. A license from the DNR is required for the passage of any utility over, under or across any state land or public water. The applicant will apply for a license to cross public lands and waters or confirm the applicability of existing licenses for the 69 kV line and must abide by the conditions established by the DNR.

In Minnesota wetlands are regulated by the U.S. Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. The proposed route will cross approximately five wetlands identified in the U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI). The wetland types are palustrine and lacustrine and include: shallow marsh, shallow open water (rivers and creeks), and seasonally flooded wooded swamp.<sup>26</sup> The NWI wetlands are located at the start of the proposed route near Somsen WMA and in riparian areas along where the route would cross the Minnesota River. The applicant also identified a number of small isolated wetlands and an aggregate mine pond. These waters, however, may or may not be regulated as wetlands. A figure and map depicting their location along the route was included in the route permit application and is presented in Appendix C.

Should a route permit be issued, the applicant will need to consult with Corps upon completion of final design and prior to construction to determine whether a Section 404 permit would be required for placement of transmission structures. Because the Minnesota River will be crossed and is considered a navigable water, the applicant may also need to apply to the Corps for a permit under Section 10 of the River and Harbors Act.

According to Federal Emergency Management Agency, Flood Insurance Rate Maps, the proposed route crosses through the Minnesota River 100-year and 500-year floodplain. The determined base flood elevation in that area of the proposed route would be well below the 75 to 90 foot tall transmission structures and electrical components. In addition, due to the transmission structures small footprint area, water drainage or floodplain elevations will not be altered by the transmission line structures. Floodplain development permits are not anticipated for this project.

Potential impacts to wetlands and water resources will be limited to ground disturbance related to construction traffic and placement of transmission line structures. Because the proposed project is being designed to follow the existing 69 kV transmission alignment for 90 percent of the proposed route including reconstruction of the existing Minnesota River crossing, potential impacts will be limited. Minimal grading of areas around pole locations may be required to accommodate construction vehicles and equipment.

The location of the proposed substation would not impact any wetlands or surface waters and is not located in a floodplain area.

#### Mitigative Measures

Xcel proposes to use construction mats or construction during frozen conditions to minimize disturbance and compaction of wetlands and riparian areas during construction. In consultation with the DNR, best management practices will be used when placing poles in or near the Minnesota River. Soil excavated from the wetlands and riparian areas will be contained and not placed back into the wetland or riparian area.

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<sup>26</sup> U.S. Fish and Wildlife Service, National Wetlands Inventory <<http://www.fws.gov/wetlands/>> (accessed February 2009).

Silt fencing or other erosion control measures identified in the Minnesota Pollution Control Agency (MPCA) Stormwater Best Practices Manual will be used to prevent sedimentation when working near wetlands and watercourses. Areas disturbed by construction activities will be restored to pre-construction conditions (soil horizons, contours, vegetation, etc.). Methods commonly used to control soil erosion and assist re-establishing vegetation may include prompt seeding, silt fences, construction during frozen conditions where practicable, and erosion control blankets. No permanent impacts to the soil or geology within the proposed project area are anticipated.

In addition, conditions provided in the Corps Section 404 and Section 10 permits, the MPCA NPDES permit, and the DNR license to cross public lands and waters will be followed.

## 6.11 Flora

The project area is largely characterized by row-crop agriculture and pasture land with remnants of flood plain forest and wetlands along the Minnesota River. Historically, the area was once a mixture of tallgrass prairies, wetlands, and floodplain forests.

Because the proposed project is being designed to follow the existing 69 kV transmission alignment for 90 percent of the proposed route including reconstruction of the existing Minnesota River crossing, potential impacts will be minimal and limited to the existing 69 kV right-of-way. Tree clearing would also be limited to the transmission right-of-way and areas that impact safe operation of the transmission facilities.

### Mitigative Measures

The project area has been largely converted from native prairies and wetlands to agricultural, residential, and industrial uses. Moreover, approximately 90 percent of the route utilizes existing utility rights-of-way. No impacts are anticipated.

## 6.12 Fauna

The numerous croplands, and sporadic prairies, wetlands, floodplain forests, and shallow lakes/surface flows in the area provide excellent habitat for a variety of wildlife. Featured wildlife includes bald eagles, prairie chickens, marbled godwits, upland sandpipers, skunk, White-tailed deer, Red fox, frogs, salamanders, snakes, turtles, mussels, to name a few.<sup>27</sup>

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<sup>27</sup> Minnesota Department of Natural Resources, Division of Ecological Services. *Tomorrow's Habitat for the Wild and Rare: An Action Plan for Minnesota Wildlife*. 2006.

There are also two DNR managed WMAs located in the immediate vicinity of the project. The Somsen WMA, a 49 acre area largely comprised of wetlands with some grassland located at the northeast corner of U.S. Highway 14 and County Highway 12. Unnamed PWI wetland (8-18P) is also located within the boundaries of this WMA. The Fritsche Creek WMA is located on the east bank of the Minnesota River, just south of the proposed line right-of-way. The Fritsche Creek WMA is approximately 385 acres in size, consisting of floodplain forests and emergent wetlands. The proposed transmission line right-of-way would not encroach upon either of the WMA statutory boundaries.

There is a potential for temporary displacement of wildlife during construction of the proposed project. The habitat that would be affected is limited to trees that require removal and fringe areas of agriculture plots. Wildlife species that may be displaced are considered "common" in Minnesota, and their displacement would not be detrimental to their populations. Displaced wildlife would likely re-establish itself in closely located and comparable habitats within the project area. Displacement of fauna will be minor and temporary in nature. No long-term effects related to displacement are anticipated except for conversion of agriculture crops for construction of the substation. Species that inhabit the Minnesota River and adjacent riparian/wetland areas will not be affected. No mitigation measures are necessary.

The principal impact posed by the transmission line project to wildlife is avian collision and/or electrocution once the transmission lines have been constructed and are operational.

#### Mitigation Measures

Xcel's standard transmission design incorporates spacing of conductor(s) and grounding devices intended to eliminate the risk of electrocution to raptors with larger wingspans that may simultaneously come in contact with a conductor and grounding devices.

In April 2002, Xcel and the USFWS entered into a memorandum of understanding (MOU) to take a comprehensive look at all of the power equipment, poles/structures, transmission lines that may potentially contribute to avian collision and mortality. The MOU provides for the development of an avian protection plan for all of Xcel's service territories and is currently in development. In addition, areas will be identified by Xcel in cooperation with the DNR and USFWS, where bird flight diverters could be incorporated into the transmission line design to prevent avian collisions attributed to visibility issues, specifically the portion of line that would span the Minnesota River and adjacent riparian areas.

### **6.13 Rare and Unique Natural Resources**

The DNR's, Natural Heritage and Nongame Research Program and the USFWS were consulted by the applicant for listed endangered, threatened, and special concern species in addition to any unique native plant communities within or near the proposed project area.

The DNR database search identified 17 known occurrences of rare species and natural communities within 1.5 miles of the project. Of the 17 rare species, only four are located within or near the proposed project boundaries. Two of these rare species are rare mussels that are located in the Minnesota River. The other two records are the Sullivant's milkweed and a mesic prairie community associated with railroad rights-of-way.

The USFWS indicated that there are no federally-listed threatened and endangered species or listed critical habitats that occur within the vicinity of the proposed project.

#### Mitigative Measures

The applicant will use silt fencing or other erosion control measures when working near waterways and wetlands (i.e. the Minnesota River) to prevent sedimentation and disturbance of these areas and their inhabitants.

The project would be designed to avoid transmission line construction within the railroad right-of-way. Should construction or encroachment of the railroad right-of-way become necessary, the applicant will perform a botanical survey. Construction and maintenance personnel will be made aware of the rare resources and plant communities during pre-construction meetings in effort to minimize possible disturbance.

## **6.14 Radio, Television, and Cellular Phone Interference**

The corona effect on transmission line conductors in rare circumstances can produce electromagnetic interference or high frequency (~120 Hz) electric noise that can potentially cause radio, television, and communication system interference. Radio interference is limited to amplitude modulation broadcast bandwidths and typically does not impact frequency modulation broadcasts. Television interference caused by corona usually occurs during foul weather when the conditions for corona are ideal. Corona-related television interference is rare and generally only a concern for conventional receivers within approximately 600 feet from the transmission line. Satellite and cable receivers are not affected by corona-generated electromagnetic interference.

#### Mitigative Measures

This phenomena is generally associated with transmission lines that are operating at 345 kV or greater. No impacts are anticipated therefore no mitigation is necessary.

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## 7.0 ALTERNATIVES

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This section evaluates two alternatives to the proposed project, a site specific route alternative and a substation location alternative. The two alternatives were suggested in comment letters received during the comment period for the scope of this EA and were included as part of the scoping decision.

For the most part, impacts from the proposed route and the alternatives identified in this EA are quite similar. Impacts with respect to public health and safety, recreation, transportation, soils and geology, air quality, fauna, and radio/television/cellular phone interference are anticipated to be the same for the proposed route and both evaluated alternatives. The alternatives and the areas of potential differences are discussed below.

### 7.1 Roberts Alternative

The Roberts' suggested that the EA should evaluate an alternative route that would follow along their property lines instead of bisecting their property as currently configured (Figure 5). The proposed route and existing 69 kV line would be re-directed to follow the Roberts' north property line east to the north-south property line and head south along that property line to 23rd North Street instead of bisecting the property as is currently proposed. This alternative is minimal in its deviation from the preferred route. There would be no new or additional impacts attributed to this alternative; therefore, the environmental impacts/mitigation described previously in this environmental assessment are relevant to this alternative. The applicant has indicated that this alternative would be feasible.

### 7.2 Substation Location Alternative

Milford Township provided comments in connection with the proposed location of the new substation for the project. The township suggested an alternative substation site to be evaluated. The alternative site is located in Milford Township Section 13, south of Brown County Highway 29 (Figure 6). The alternative would have the substation site located approximately 900 feet west of Brown County Highway 29 and the DM&E Railroad intersection, on the south side of the existing railroad tracks, in Milford Township, Section 13. Except for potential impacts to rare and unique natural resources, this alternative substation location would not create any new or additional impacts when compared to the proposed; therefore, the environmental impacts/mitigation described previously in this environmental assessment are relevant to this alternative. This alternative substation location would also avoid potential land use conflicts as described in Section 6.7.

Because this alternative location is adjacent to the DM&E railroad where known occurrences of Sullivan's milkweed and a mesic prairie community have previously been identified, the applicant, prior to construction, must perform a botanical survey of this area in addition to the mitigation measures described in Section 6.13. Construction of the substation would directly impact approximately 11.5 acres of land near the railroad right-of-way. Along with the substation enclosure, a new driveway and stormwater retention pond would be also be constructed on-site. These activities would entail grading and excavation and would be more invasive than placement of just transmission line structures, as in the proposed route.

## 8.0 PERMITS AND APPROVALS REQUIRED

Federal, state and local permits for the proposed project are listed below in Table 12.

**Table 12: Potentially Required Permits**

<b>Permit</b>	<b>Authority</b>
Route Permit	Minnesota Public Utilities Commission
Utility Crossing Permit	State, County, Township, City
Over-Width Load Permit	State, County, Township, City
Driveway/Access Permit	County, Township, City
Wetland Conservation Act	State, County
License to Cross Public Waters	Minnesota Department of Natural Resources
Utility Permit on County Highways Rights-of-Way	Minnesota Department of Transportation
State Section 401 Water Quality Certification	Minnesota Pollution Control Agency
National Pollutant Discharge Elimination System Permit	Minnesota Pollution Control Agency
Section 404 Approval	U.S. Army Corps of Engineers
Section 10 Permit	U.S. Army Corps of Engineers

## 9.0 REFERENCES

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Much of the information contained within this document was provided by the applicant or the applicant's representatives in the Northern States Power Company, *Application to the Minnesota Public Utilities Commission for a Route Permit, West New Ulm - Fort Ridgely 115/69 kV Transmission Line Rebuild Project*, August 29, 2008 (available for viewing at: <http://energyfacilities.puc.state.mn.us/Docket.html?Id=19744>).

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United States Census Bureau, Table DP-1. Profile of General Demographic Characteristics: 2000. Geographic Area: Lafayette township, Nicollet County, Minnesota. ([http://govpubs.lib.umn.edu/census/profile\\_twp.phtml](http://govpubs.lib.umn.edu/census/profile_twp.phtml))

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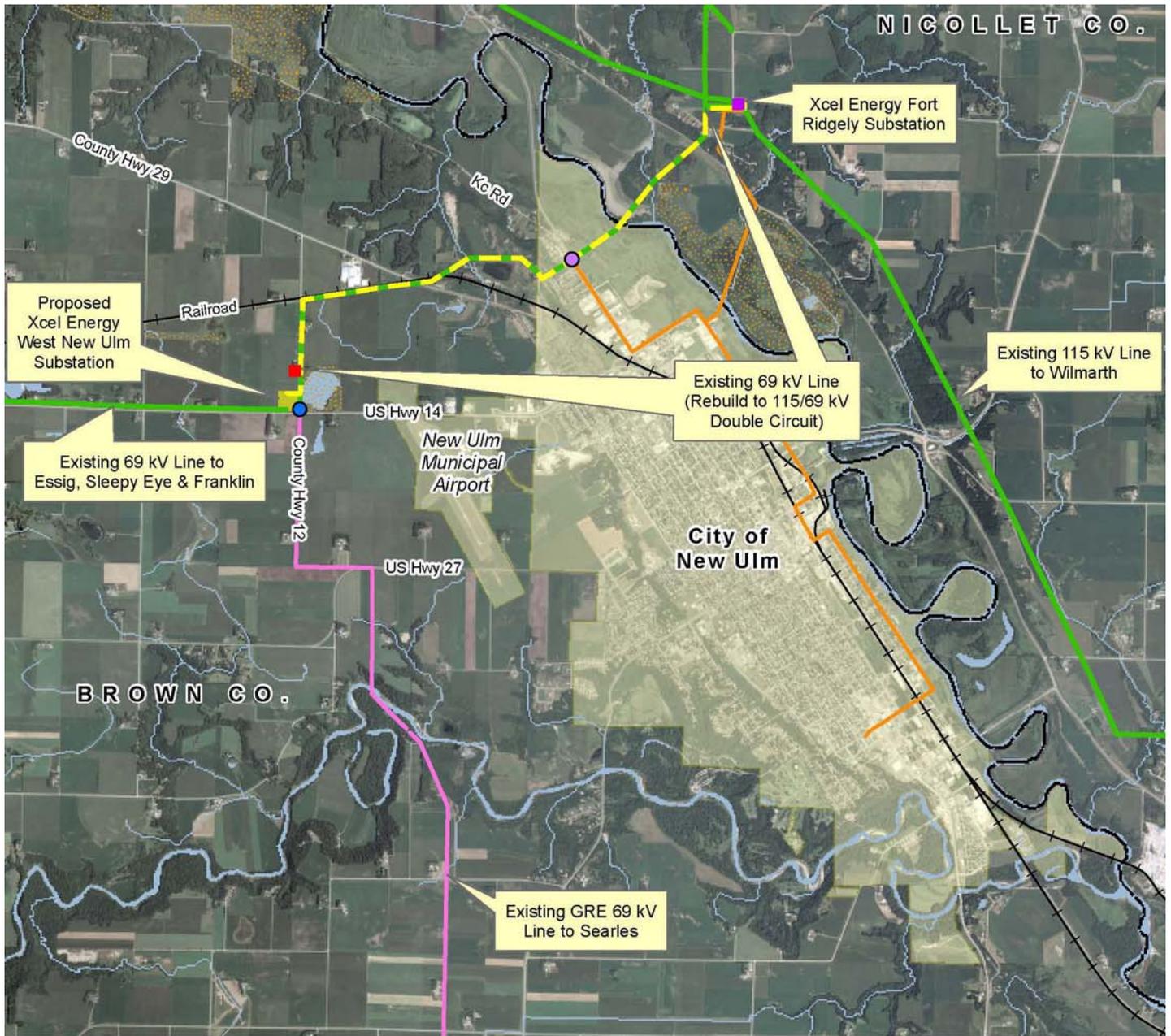
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## FIGURES

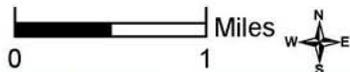


## Proposed West New Ulm Substation and 115/69 kV Transmission Line Rebuild Project

Brown and Nicollet counties, MN

### Legend

- |  |  |
|--|--|
| Existing Substation - Fort Ridgely               | GRE Transmission Line                      |
| Existing Substation - Brown Co. REA              | New Ulm Public Utilities Transmission Line |
| New Ulm Switch                                   | Railroad                                   |
| GRE Switch                                       | MN DNR Wildlife Area                       |
| Proposed Xcel Energy 115/69 kV Transmission Line | Waterbody                                  |
| Proposed Xcel Energy West New Ulm Substation     | River/Stream                               |
| Xcel Energy Transmission Line                    | County Boundary                            |
| City Boundary                                    |  |



Map taken from West New Ulm to Fort Ridgely 115/69 kV Transmission Line Rebuild Project Application to the Minnesota Public Utilities Commission for a Route Permit. Northern States Power. August 29, 2008.

**Figure 1**  
Proposed Route Overview

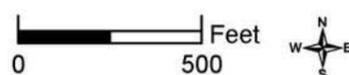


## Proposed West New Ulm Substation and 115/69 kV Transmission Line Rebuild Project

Brown and Nicollet counties, MN

### Legend

- |  |  |                                   |
|--|--|-----------------------------------|
| ● GRE Switch                                       | — GRE Transmission Line                      | City of New Ulm Municipal Airport |
| ■ Existing Substation - Brown Co. REA              | — New Ulm Public Utilities Transmission Line | ▨ Airport Runway Zone             |
| ■ Proposed Xcel Energy West New Ulm Substation     | — Railroad                                   | ▨ Safety Zone "A"                 |
| — Proposed Xcel Energy 115/69 kV Transmission Line | ● MN DNR Wildlife Area                       | ▨ Safety Zone "B"                 |
| ▨ Proposed Route Corridor                          | — Waterbody                                  | ▨ Safety Zone "C"                 |
| — Xcel Energy Transmission Line                    | — River/Stream                               |                                   |
| — Xcel Energy Transmission Line Connection         | — City Boundary                              |                                   |



**Figure 2**  
Proposed Route Detail A



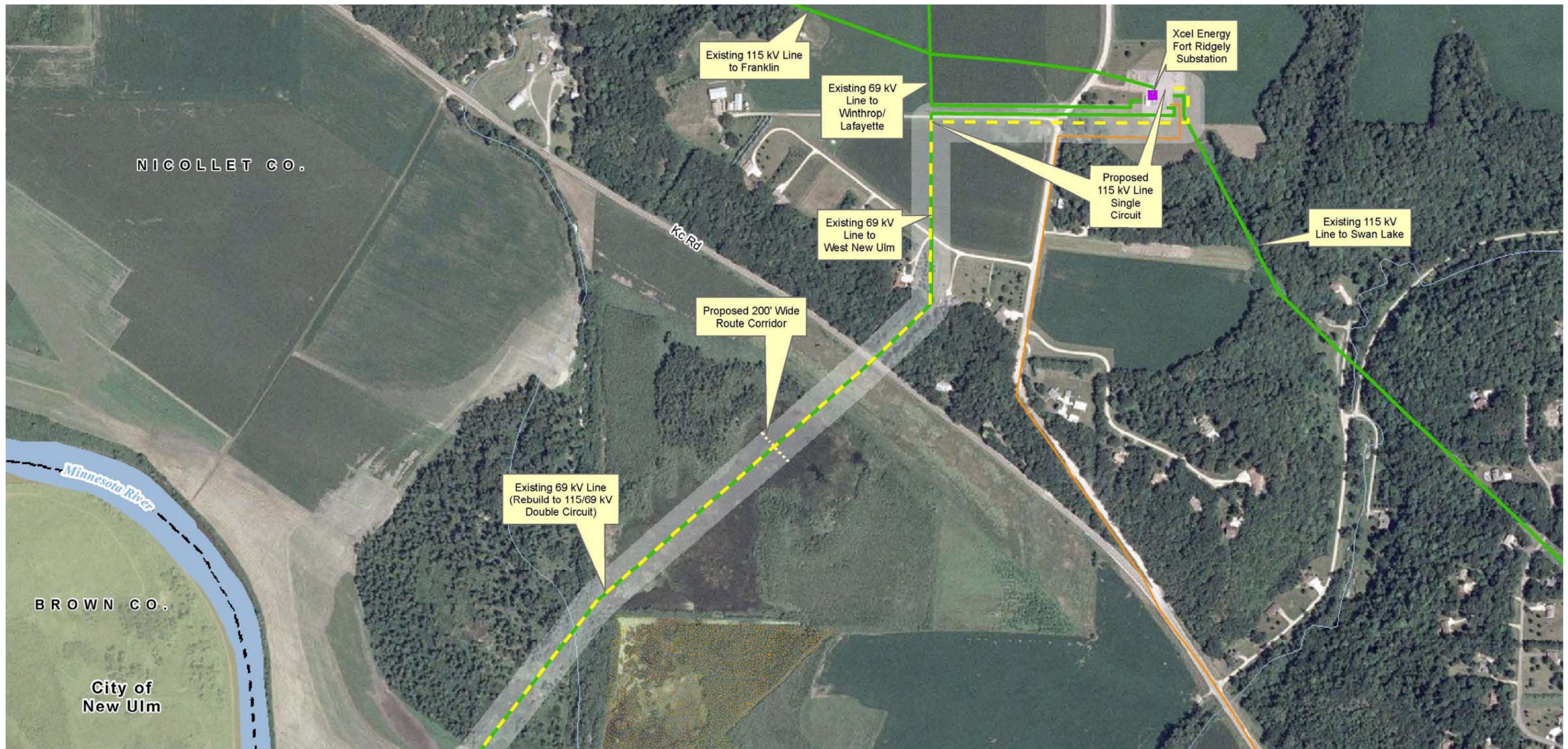
### Proposed West New Ulm Substation and 115/69 kV Transmission Line Rebuild Project

Brown and Nicollet counties, MN

- Legend**
- Proposed Xcel Energy/New Ulm Switch (Move From Existing Location)
  - New Ulm Switch
  - Proposed Xcel Energy 115/69 kV Transmission Line
  - Proposed Route Corridor
  - New Ulm Public Utilities Transmission Line
  - Xcel Energy Transmission Line
  - Railroad
  - ~ Waterbody
  - ~ River/Stream
  - County Boundary
  - City Boundary



**Figure 3**  
Proposed Route Detail B

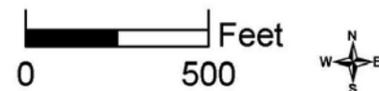


### Proposed West New Ulm Substation and 115/69 kV Transmission Line Rebuild Project

Brown and Nicollet counties, MN

#### Legend

- Existing Substation - Fort Ridgely
- Proposed Xcel Energy 115/69 kV Transmission Line
- Proposed Route Corridor
- Xcel Energy Transmission Line
- New Ulm Public Utilities Transmission Line
- Railroad
- MN DNR Wildlife Area
- Waterbody
- River/Stream
- County Boundary
- City Boundary



**Figure 4**  
Proposed Route Detail C



Base map taken from West New Ulm to Fort Ridgley 115/69 kV Transmission Line Rebuild Project Application to the Minnesota Public Utilities Commission for a Route Permit. Northern States Power. August 29, 2008.

- Proposed Route
- Existing 69 kV Transmission Line
- Existing New Ulm PUC Transmission Line
- Roberts Alternative

**Figure 5**  
Roberts Alternative



## **APPENDIX A**

Environmental Assessment Scoping Decision



**In the Matter of the Application for a Route  
Permit for the West New Ulm 115/69 Kilovolt  
Transmission Line Rebuild**

**ENVIRONMENTAL ASSESSMENT  
SCOPING DECISION  
PUC Docket No. E002/TL-08-956**

The above matter has come before the Director of the Office of Energy Security for a decision on the Scope of the Environmental Assessment to be prepared on Xcel Energy's proposed 115/69 kV transmission line rebuild from a newly proposed West New Ulm substation to the existing Fort Ridgely substation, a new 4.2 mile transmission line and substation in Brown and Nicollet counties, Minnesota (Figure 1). A route permit application for the project was filed on August 29, 2008, and accepted by the Minnesota Public Utilities Commission (Commission) on October 26, 2008.

The applicants indicate that the project will provide New Ulm Public Utilities a firm transmission source capable of meeting the total peak demand on the system (approximately 45 megawatts). Today, under certain contingencies, transmission limitations require New Ulm Public Utilities to self generate whenever demand exceeds approximately 15 megawatts (MW). The project will also provide needed transmission support to the electrical system served by Xcel Energy's existing Franklin – Fort Ridgely 115 kV line.

The Office of Energy Security (OES) Energy Facility Permitting (EFP) staff held a public information and environmental assessment scoping meeting on November 19, 2008, at the New Ulm Civic Center, in New Ulm, Minnesota, to discuss the project with the public and solicit public input on the scope of the environmental assessment to be prepared. The attendance sign-in sheet indicated approximately 7 people attended the meeting. The public was given until December 5, 2008, to submit written and/or email comments.

The OES EFP received a total of 6 comment letters that were reviewed and considered during preparation of the Scope of the Environmental Assessment.

Three letters from New Ulm citizens voiced preference for an alternative to the segment of the applicant's proposed route that runs along 23<sup>rd</sup> Street and uses the existing 69 kV right-of-way. The proposed alternative would increase the length of the preferred route by approximately 1,800 feet and would require the creation of approximately 4,500 feet of new "cross-country" right-of-way, thus impacting a number of parcels/residences not currently affected in addition to increased loss of trees and vegetation. The EFP reviewed the alternative and concluded it would likely not have lesser environmental effects when compared to the project as proposed. This route alternative will not be evaluated in the Environmental Assessment.

A letter from James and Alice Roberts requests evaluating an alternative route that would follow along their property lines instead of bisecting their property as currently configured (Figure 2). The Roberts Alternative will be evaluated in the Environmental Assessment.

Milford Township provided comments in connection with the proposed location of the new substation for the project. Due to the proposed site being located on agricultural land and in an area marked for future expansion of the city of New Ulm, the township suggests an alternative substation site be evaluated. The alternative site is located in Milford Township Section 13, south of Brown County Highway 29 (Figure 3). The Milford Township Substation Alternative will be evaluated in the Environmental Assessment.

A letter from New Ulm Public Utilities recommends placing the route segment proposed along 23<sup>rd</sup> Street underground. A revised pole design and placement that would maintain the existing distance of the 69 kV line from the front property lines along 23<sup>rd</sup> Street and allow for sidewalk installation was also recommended. These suggestions will be evaluated in the Environmental Assessment as possible mitigation measures.

Having reviewed the matter, consulted with EFP staff, and in accordance with Minnesota Rule 7849.5700, I hereby make the following Scoping Decision:

### **MATTERS TO BE ADDRESSED**

The Environmental Assessment on the proposed New Ulm to Fort Ridgely 115/69 kV transmission line rebuild project will address and provide information on the following matters:

#### **A. GENERAL DESCRIPTION OF THE PROPOSAL**

1. Purpose of the Transmission Line
2. Project Location and Environmental Setting
3. Engineering and Operation Design
  - a. Transmission Line and Structures
  - b. Construction Procedures
  - c. Right-of-Way Maintenance

#### **B. IMPACTS AND MITIGATIVE MEASURES**

1. Public Health and Safety
2. Noise
3. Aesthetics
4. Socioeconomics
5. Recreation
6. Transportation and Public Services
7. Radio, Television, and Cellular Phone Interference
8. Archaeological and Historic Resources
9. Land Use (land-based economies)
10. Air Quality
11. Surface Water and Wetland Resources
12. Flora and Fauna
13. Rare and Unique Natural Resources

#### **C. ALTERNATIVES TO BE ADDRESSED IN THE ENVIRONMENTAL ASSESSMENT**

In addition to the route proposed by Xcel Energy, the Environmental Assessment shall address the following alternative route and substation locations:

1. Roberts Alternative – The proposed route and existing 69 kV line would be re-directed to follow the Roberts' north property line east to the north-south property line and head south along that property line to 23<sup>rd</sup> Street instead of bisecting the property as is currently configured.
2. Milford Township Substation Alternative – Locate the proposed substation approximately 900 feet west of Brown County Highway 29 and the DM&E Railroad intersection in Milford Township, Section 13.

**D. IDENTIFICATION OF PERMITS**

The Environmental Assessment will include a list of permits that will be required for the project.

**E. ISSUES OUTSIDE THE SCOPE OF THE ENVIRONMENTAL ASSESSMENT**

The Environmental Assessment will not consider the following:

1. The manner in which land owners are paid for transmission rights-of-way easements, as that is outside the jurisdiction of the Commission.
2. Alternatives not described specifically in this Scoping Decision.

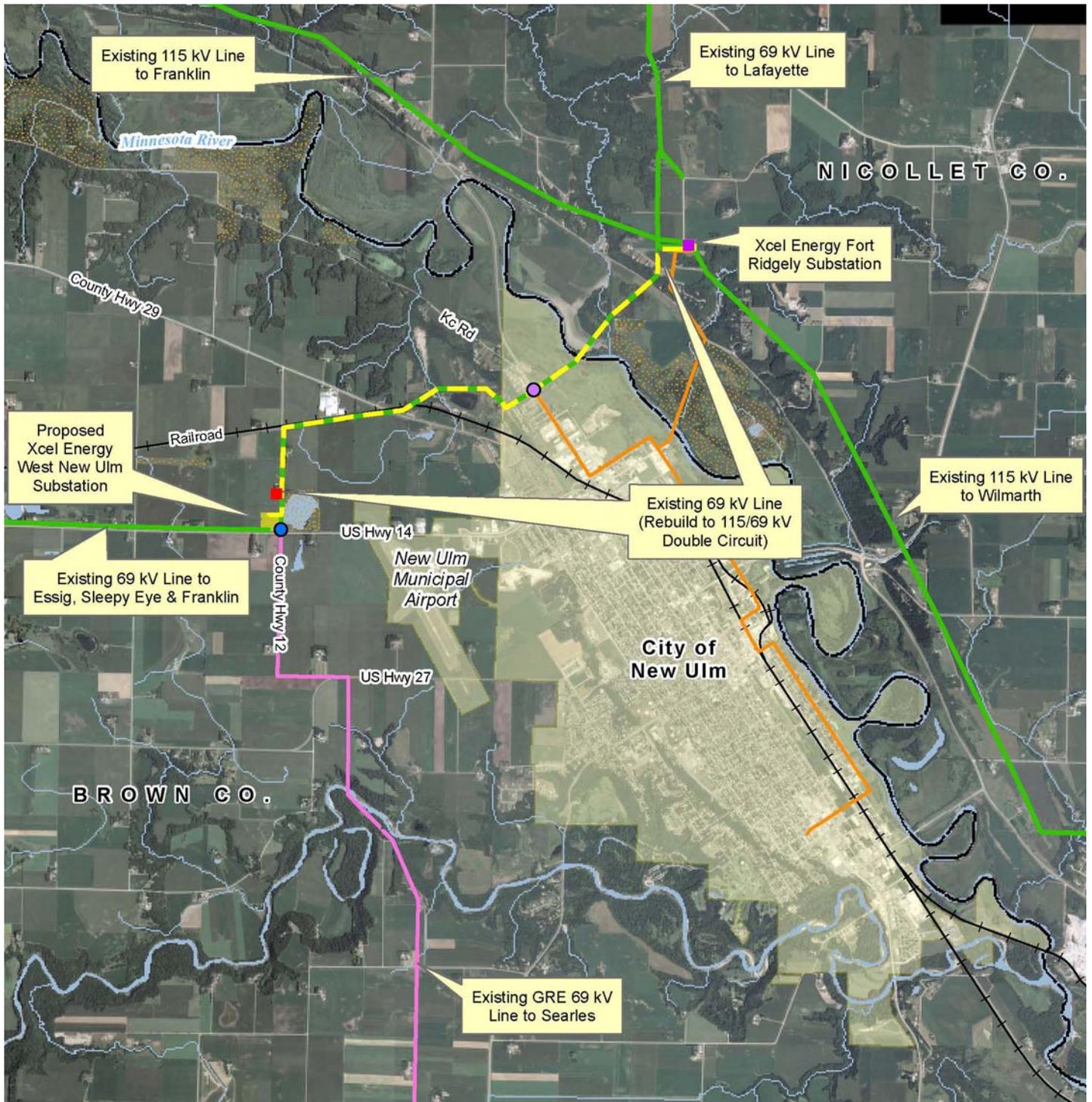
**F. SCHEDULE**

The Environmental Assessment shall be completed and available in February 2009. A public hearing will be held in the New Ulm area after the Environmental Assessment has been issued and notice served.

Signed this 19<sup>th</sup> day of December, 2008

STATE OF MINNESOTA  
DEPARTMENT OF COMMERCE  
OFFICE OF ENERGY SECURITY

  
\_\_\_\_\_  
William Glahn, Director



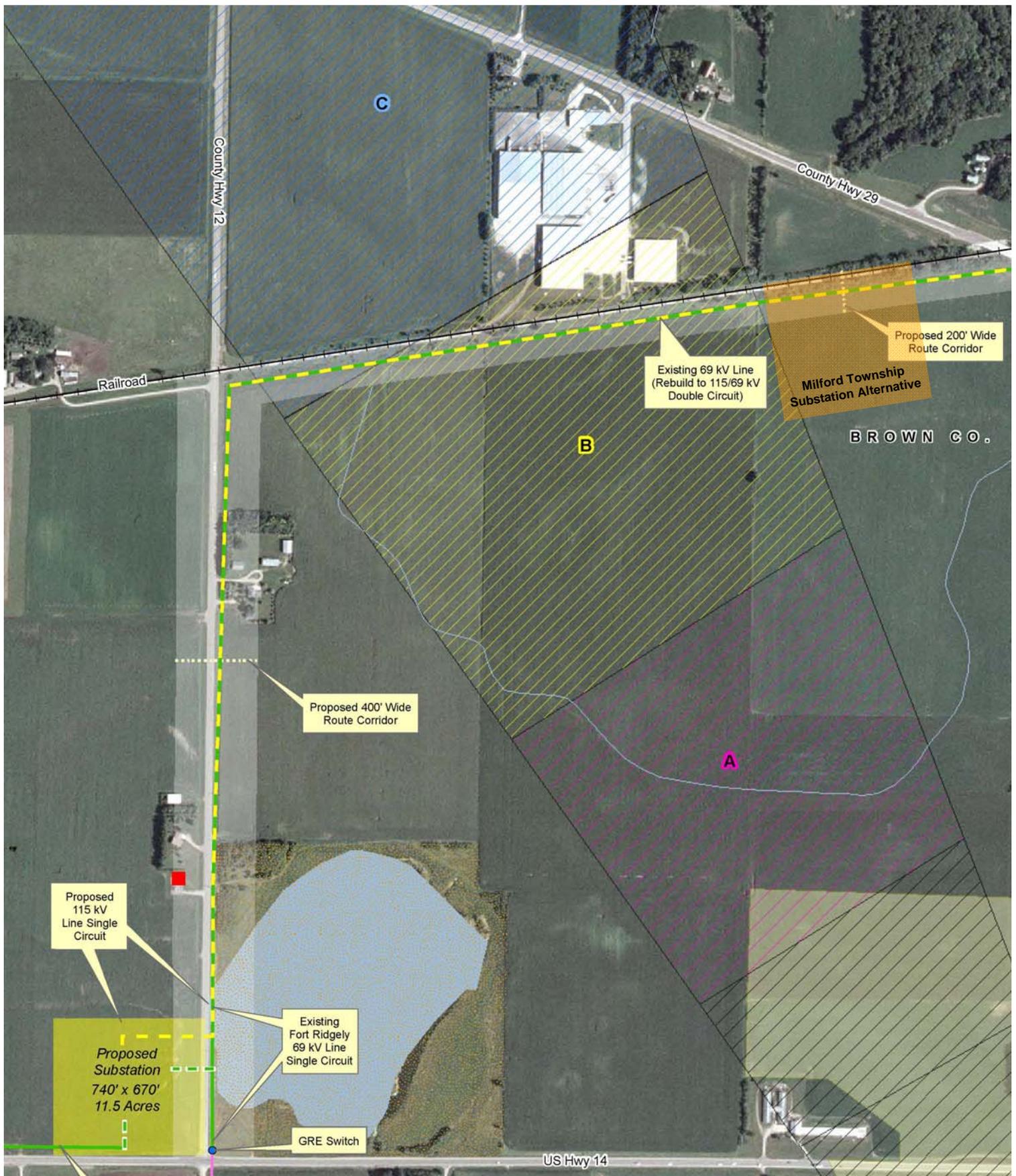
Base map taken from West New Ulm to Fort Ridgely 115/69 kV Transmission Line Rebuild Project Application to the Minnesota Public Utilities Commission for a Route Permit. Northern States Power. August 29, 2008.

**Figure 1**  
Proposed Route



Base map taken from West New Ulm to Fort Ridgley 115/69 kV Transmission Line Rebuild Project Application to the Minnesota Public Utilities Commission for a Route Permit. Northern States Power. August 29, 2008.

**Figure 2**  
Transmission Line Route Alternatives



Base map taken from West New Ulm to Fort Ridgely 115/69 kV Transmission Line Rebuild Project Application to the Minnesota Public Utilities Commission for a Route Permit. Northern States Power. August 29, 2008.

**Figure 3**  
Substation Alternative

## **APPENDIX B**

Sample Route Permit

**ROUTE PERMIT FOR CONSTRUCTION OF A HIGH  
VOLTAGE TRANSMISSION LINE  
IN**

**LINCOLN COUNTY, MINNESOTA**

**ISSUED TO  
NORTHERN STATES POWER COMPANY d/b/a XCEL  
ENERGY**

**PUC DOCKET No. E002/TL-07-1626**

In accordance with the requirements of Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7849, this route permit is hereby issued to:

Northern States Power d/b/a Xcel Energy

Northern States Power Company, d/b/a Xcel Energy (hereinafter referred to as Xcel Energy), is authorized by this route permit to construct the six and one-half mile segment located within the State of Minnesota, of a new 115 kilovolt (kV) high voltage transmission line between the Yankee Substation in Lincoln County, Minnesota to the Brookings Substation in Brookings County, South Dakota.

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

Approved and adopted this \_\_\_\_\_ day of August, 2008  
BY ORDER OF THE COMMISSION

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Burl W. Haar,  
Executive Secretary

## **I. ROUTE PERMIT**

The Minnesota Public Utilities Commission (PUC or Commission) hereby issues this route permit to Xcel Energy (Xcel Energy or permittee) pursuant to Minnesota Statutes Chapter 216E and Minnesota Rules Chapter 7849. This permit authorizes Xcel Energy to construct approximately six and one-half miles of 115 kV high voltage transmission line and associated facilities at the substations to accommodate the new transmission line.

## **II. PROJECT DESCRIPTION**

Xcel Energy is authorized to build an approximately six and one-half mile segment of 115 kV transmission line located in Minnesota that will create a second connection between the Yankee Substation in Lincoln County, Minnesota and the Brookings Substation located in Brookings County, South Dakota including necessary modifications to the existing Yankee Substation.

Xcel Energy will use the same structures for the entire transmission line route. The structures will be steel, single circuit poles with three davit arms. The steel poles are to have a galvanized or weathering steel finish and will be anchored with concrete pier foundations that may vary from 6.5 to 9 feet in diameter and 12 or more feet in depth from ground surface. The poles will average 90 feet in height and approximately 42 inches in diameter for tangent poles and 65 inches in diameter for dead-end poles, with an average span of 500 feet between the structures.

The transmission line authorized by this permit will be three-phase, bundled conductor, single circuit configurations for the entirety of the project. The phases for this project will consist of bundled conductors comprised of two aluminum conductor steel supported cables or similar, made of seven steel wires in the center, surrounded by 26 aluminum strands. The separate conductors will be 795,000 circular mils or approximately 1.1 inches in diameter. There will also be shield wires strung above the phases to prevent damage from potential lightning strikes. The shield wire may include a fiber optic cable that allows for substation protection equipment to communicate with other terminals on the line.

The Yankee Substation will be modified to accommodate the switching gear, bus work and new transformers necessary to integrate the proposed 115 kV transmission line into the transmission network. The construction and new equipment will be located within the substation's existing fenced area. The new equipment includes a 115 kV dead end structure with a 115 kV, 2000A motor-operated disconnect; two empty circuit breaker bays; a 115 kV, 3000A breaker between the Main Bus #1 and the second transformer; a single-phase coupling capacitor voltage transformer on the second transformer position; and four 115 kV, 3000A group-operated disconnects.

All controls and protection for the new breaker need to be installed, in addition to all foundations, steel, conductor, trenching, and grounding for the equipment installations. No additional grading will be required at the existing substation.

### **III. DESIGNATED ROUTE / SITE**

The route designated by the Commission in this permit comprises the six and one-half mile segment located in Minnesota and as described in detail below, as analyzed in the environmental assessment, and shown on the official route map attached to this permit.

The route width approved by this permit is 400 foot wide; 200 feet each side of the road centerline for the six and one-half mile route with the exception of one segment. A 1,200 foot route width is approved near the intersection of 180<sup>th</sup> Street and 110<sup>th</sup> Avenue to provide greater flexibility during detailed design to develop the best method for avoiding a large wetland and the existing Yankee to Brookings #1 high voltage transmission line. The approved right-of-way width is up to 75 feet.

The route that begins at the Yankee Substation located at the southeast corner of 120<sup>th</sup> Avenue and 160<sup>th</sup> Street in Lincoln County. The line will exit the substation from the west and extend approximately 600 feet to County Road 1. The line will continue north approximately 1,300 feet along County Road 1 until it reached 160<sup>th</sup> Street. The line then proceed west, following 160<sup>th</sup> Street for approximately one mile to 110<sup>th</sup> Avenue where it turns north along 110<sup>th</sup> Avenue for an estimated 1.7 miles. An approximate 500 foot segment along 110<sup>th</sup> Avenue just south of 170<sup>th</sup> Street may be located 35 to 40 feet west of an existing north/south positioned 34.5 kV PPM Energy, Inc. owned feeder line to minimize impacts to a shelterbelt for a residence located on the east side of 110<sup>th</sup> Avenue. A large wetland located to the south of the 110<sup>th</sup> Avenue and 180<sup>th</sup> Street intersection will require that the route be detoured to the west and around the wetland, thereby avoiding construction within the wetland. Following the detour around the wetland the proposed route will continue north along 110<sup>th</sup> Avenue for approximately 2.2 miles to a half-section line about one-half mile north of 200<sup>th</sup> Street. The route will then be directed northwest and then west along the half-section line towards the Minnesota/South Dakota border. The route will then proceed north along the state line for one-third mile turning west at 209<sup>th</sup> Street where it will enter South Dakota.

The proposed transmission lines and substation will be designed to meet or surpass all relevant local and state codes, and North American Electric Reliability Council and Xcel Energy standards. Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during and after installation.

## IV. PERMIT CONDITIONS

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

**A. Plan and Profile.** At least 14 calendar days before right-of-way preparation for construction begins, the permittee shall provide the commission with a plan and profile of the right-of-way and the specifications and drawings for right-of-way preparation, construction, cleanup, and restoration for the transmission line. The permittee may not commence construction until the 14 days has expired or until the commission has advised the permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this permit. If the permittee intends to make any significant changes in its plan and profile or the specifications and drawings after submission to the commission, the permittee shall notify the commission at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this permit.

### **B. Construction Practices.**

- 1. Application.** The Permittee shall follow those specific construction practices and material specifications described in the Xcel Energy Application to the Public Utilities Commission for a Route Permit, dated January 18, 2008, and as described in the environmental assessment unless this permit establishes a different requirement, in which case this permit shall prevail.
- 2. Field Representative.** At least 10 days prior to commencing construction, the permittee shall advise the commission in writing of the person or persons designated to be the field representative for the permittee with the responsibility to oversee compliance with the conditions of this permit during construction. The field representative's address, phone number, and emergency phone number shall be provided to the commission and shall be made available to affected landowners, residents, public officials and other interested persons. The permittee may change its field representative at any time upon written notice to the commission.
- 3. Local Governments.** The Xcel Energy shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction.
- 4. Cleanup.** All waste and scrap that is the product of construction shall be removed from the area and properly disposed of upon completion of each task. Personal litter, including bottles, cans, and paper from construction activities shall be removed on a daily basis.

- 5. Vegetation Removal in the Right-of-Way.** The permittee shall minimize the number of trees to be removed in selecting the right-of-way. As part of construction, low growing brush or tree species are allowable at the outer limits of the easement area. Taller tree species that endanger the safe and reliable operation of the transmission facility need to be removed. To the extent practical, low growing vegetation that will not pose a threat to the transmission facility or impede construction should remain in the easement area.
  - 6. Erosion Control.** The permittee shall implement reasonable measures to minimize runoff during construction and shall promptly plant or seed, erect silt fences, and/or use erosion control blankets in non-agricultural areas that were disturbed where structures are installed. All areas disturbed during construction of the facilities will be returned to their pre-construction condition.
  - 7. Temporary Work Space.** The permittee shall limit temporary easements to special construction access needs and additional staging or lay-down areas required outside of the authorized right-of-way.
  - 8. Restoration.** The permittee shall restore the right-of-way, temporary work spaces, access roads, abandoned right-of-way, and other private lands affected by construction of the transmission line. Restoration within the right-of-way must be compatible with the safe operation, maintenance, and inspection of the transmission line. Within 60 days after completion of all restoration activities, the permittee shall advise the commission in writing of the completion of such activities.
  - 9. Notice of Permit.** The permittee shall inform all employees, contractors, and other persons involved in the transmission line construction of the terms and conditions of this permit.
- C. Periodic Status Reports.** Upon request, the permittee shall report to the commission on progress regarding finalization of the route, design of structures, and construction of the transmission line. The permittee need not report more frequently than quarterly.
- D. Complaint Procedure.** Prior to the start of construction, the permittee shall submit to the commission, the procedures that will be used to receive and respond to complaints. The procedures shall be in accordance with the requirements set forth in the complaint procedures attached to this permit.
- E. Notification to Landowners.** The permittee shall provide all affected landowners with a copy of this permit at the time of the first contact with the landowners after issuance of this permit.

Xcel Energy shall contact landowners prior to entering the property or conducting maintenance along the route and avoid maintenance practices, particularly the use of fertilizer or pesticides, inconsistent with the landowner's or tenant's use of the land.

Xcel Energy shall work with landowners to locate the high voltage transmission lines to minimize the loss of agricultural land, forest, and wetlands, and to avoid homes and farmsteads.

#### **F. Completion of Construction.**

- 1. Notification to Commission.** At least three days before the line is to be placed into service, the permittee shall notify the commission of the date on which the line will be placed into service and the date on which construction was complete.
- 2. As-Builts.** Upon request of the commission, the permittee shall submit copies of all the final as-built plans and specifications developed during the project.
- 3. GPS Data.** Within 60 days after completion of construction, the permittee shall submit to the commission, in the format requested by the commission, geo-spatial information (GIS compatible maps, GPS coordinates, etc.) for all above ground structures associated with the transmission lines, each switch, and each substation connected.

#### **G. Electrical Performance Standards.**

- 1. Grounding.** The permittee shall design, construct, and operate the transmission line in a manner that the maximum induced steady-state short-circuit current shall be limited to five milliamperes, root mean square (rms) alternating current between the ground and any non-stationary object within the right-of-way, including but not limited to large motor vehicles and agricultural equipment. All fixed metallic objects on or off the right-of-way, except electric fences that parallel or cross the right-of-way, shall be grounded to the extent necessary to limit the induced short circuit current between ground and the object so as not to exceed one milliamperes rms under steady state conditions of the transmission line and to comply with the ground fault conditions specified in the National Electric Safety Code.
- 2. Electric Field.** The transmission line shall be designed, constructed, and operated in such a manner that the electric field measured one meter above ground level immediately below the transmission line shall not exceed 8.0 kV/m rms.

**3. Interference with Communication Devices.** If interference with radio or television, satellite or other communication devices is caused by the presence or operation of the transmission line, the permittee shall take whatever action is prudently feasible to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of the line.

## H. Special Conditions

**1. Archaeological and Historic Resources.** Xcel Energy shall make every effort to avoid impacts to identified archaeological and historic resources when installing the high voltage transmission line on the approved route. In the event that an impact would occur, the applicants will consult with State Historic Preservation Office and invited consulting parties. Where feasible, avoidance of the resource is required. Where not feasible, mitigation for project-related impacts on National Register of Historic Properties-eligible archaeological and historic resources must include an effort to minimize project impacts on the resource.

**2. Wetlands/Water Resources.** Wetland impact avoidance measures that shall be implemented during design and construction of the transmission line will include spacing and placing the power poles at variable distances to span and avoid wetlands. Unavoidable wetland impacts as a result of the placement of poles shall be limited to the immediate area around the poles. To minimize impacts, construction in wetland areas shall occur in the winter. If necessary, wooden or composite mats will be used to protect wetland vegetation. All requirements of the U.S. Army Corps of Engineers (wetlands under federal jurisdiction), Minnesota Department of Natural Resources (Public Waters/Wetlands), and County (wetlands under the jurisdiction of the Minnesota Wetland Conservation Act) shall be met.

Impacts to floodplains, in particular the placement of power pole structures, shall be avoided to the maximum extent possible by placing these structures above the floodplain contours outside of the designated floodplain, and by spanning the floodplain with the transmission line.

If construction activities will result in the disturbance of one acre or more of soils, a National Pollutant Discharge Elimination System stormwater permit from the Minnesota Pollution Control Agency will be required. Standard erosion control measures outlined in Minnesota Pollution Control Agency guidance and best management practices regarding sediment control practice during construction. These practices include, but are not limited to, protecting storm drain inlets, use of silt fences, protecting exposed soil, immediately stabilizing restored soil, controlling temporary soil stockpiles, and controlling vehicle tracking.

**3. Avian Collision.** The applicant will evaluate mitigative measures in areas of the project where the chance of avian collision or electrocution is higher. Areas will be identified by Xcel Energy in cooperation with the Minnesota Department of Natural Resources and the U.S. Fish and Wildlife Service where swan flight diverters could be incorporated into the transmission line design to prevent swan and other large avian collisions attributed to visibility issues.

**4. Rare and Unique Resources.** The unnamed wetland tributary to Medary Creek, located south of 180<sup>th</sup> Street and 110<sup>th</sup> Avenue and directly in-line with the proposed project route is designated as critical habitat for the Topeka shiner, a federally endangered and state specie of special concern. Mitigation measures for potential impacts to the Topeka shiner and its habitat will include construction techniques and sediment control measures such as following recommendations outlined in the USFWS, *Recommendations for Projects Affecting Waters Inhabited by Topeka Shiners (Notropis topeka) in Minnesota*; May 11, 2007; utilizing silt fences, practicing prompt re-seeding, and using erosion control blankets; and placing structures to either span critical watercourses or avoidance by routing around the area, as in the case of the large wetland tributary to Medary Creek.

**5. Accommodation of Existing and Planned Infrastructure.** Xcel Energy is required to work with the landowners, townships, cities, and counties along the route to accommodate their concerns regarding snow drifts, drain tiles, pole depth and placement in relationship to existing roads and road expansion plans. The permittee shall work with the owners of existing distribution lines identified along the route to either “underbuild” on the new structures or bury the distribution lines, if deemed feasible.

**6. Alignment Alternative.** Mr. Theodore Schwing suggested that the transmission line be routed along the east side of 110<sup>th</sup> Avenue through Section 19 to approximately the three quarter point (residential structure) of Section 18, the line would then cross to the west side of 100<sup>th</sup> Avenue at this point and continue north as proposed. This would avoid the residence located on the east side of 110<sup>th</sup> Avenue in the northwest quadrant of Section 18. The permittee will consult with Mr. Schwing and consider the feasibility of the suggested alternative prior to final location of structures and rights-of-way.

## **I. Other Requirements.**

**1. Applicable Codes.** The permittee shall comply with applicable North American Electric Reliability Council construction standards and requirements of the National Electric Safety Code including clearances to ground, clearance to crossing utilities, clearance to buildings, right-of-way widths, erecting power poles, and stringing of transmission line conductors.

**2. Other Permits.** The permittee shall comply with all applicable state rules and statutes. The permittee shall obtain all required local, state and federal permits for the project and comply with the conditions of these permits. A list of the required permits is included in the permit application and the environmental assessment. The permittee shall submit a copy of such permits to the commission upon request.

**3. Pre-emption.** Pursuant to Minnesota Statutes 216E.10, subdivisions 1 and 2, this route permit shall be the sole route approval required to be obtained by the permittee and this permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose government.

**J. Delay in Construction.** If the permittee has not commenced construction or improvement of the route within four years after the date of issuance of this permit, the commission shall consider suspension of the permit in accordance with Minnesota Rule 7849.5970.

## **V. PERMIT AMENDMENT**

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

## **VI. TRANSFER OF PERMIT**

The permittee may request at any time that the commission transfer this permit to another person or entity. The permittee shall provide the name and description of the person or entity to whom the permit is requested to be transferred, the reasons for the transfer, a description of the facilities affected, and the proposed effective date of the transfer. The person to whom the permit is to be transferred shall provide the commission with such information as the commission shall require to determine whether the new permittee can comply with the conditions of the permit. The commission may authorize transfer of the permit after affording the permittee, the new permittee, and interested persons such process as is required.

## **VII. REVOCATION OR SUSPENSION OF THE PERMIT**

The commission may initiate action to revoke or suspend this permit at any time. The commission shall act in accordance with the requirements of Minnesota Rules part 7849.6010 to revoke or suspend the permit.

EXAMPLE ONLY

**PUBLIC UTILITIES COMMISSION  
COMPLAINT REPORT PROCEDURES FOR  
HIGH VOLTAGE TRANSMISSION LINES**

**1. Purpose**

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

**2. Scope**

This reporting plan encompasses complaint report procedures and frequency.

**3. Applicability**

The procedures shall be used for all complaints received by the permittee.

**4. Definitions**

***Complaint*** – A statement presented by a person expressing dissatisfaction, resentment, or discontent as a direct result of the high voltage transmission line and associated facilities. Complaints do not include requests, inquiries, questions or general comments.

***Telephone Complaint*** – A person presenting a complaint by telephone shall indicate whether the complaint relates to (1) a substantive routing permit matter, (2) a high voltage transmission line location matter, or (3) a compensation matter. All callers must provide the following information when presenting a complaint by telephone: (1) name; (2) date and time of call; (3) phone number; (4) email address (if available); (5) home address; (6) parcel number.

***Substantial Complaint*** – Written complaints alleging a violation of a specific route permit condition that, if substantiated, could result in permit modification or suspension pursuant to the applicable regulations.

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

## 5. Responsibilities

Everyone involved with any phase of the high voltage transmission line is responsible to ensure expeditious and equitable resolution of all complaints. It is therefore necessary to establish a uniform method for documenting and handling complaints related to this high voltage transmission line project. The following procedures will satisfy this requirement:

- A. The permittee shall document all complaints by maintaining a record of all applicable information concerning the complaint, including the following:
  1. Name of the permittee and project.
  2. Name of complainant, address and phone number.
  3. Precise property description or tract numbers (where applicable).
  4. Nature of complaint.
  5. Response given.
  6. Name of person receiving complaint and date of receipt.
  7. Name of person reporting complaint to the PUC and phone number.
  8. Final disposition and date.
- B. The permittee shall assign an individual to summarize complaints for transmittal to the PUC.

## 6. Requirements

The permittee shall report all complaints to the PUC according to the following schedule:

***Immediate Reports*** – All substantial complaints shall be reported to the PUC by phone or by e-mail the same day received or on the following working day for complaints received after working hours. Such reports are to be directed to high voltage transmission line permit compliance at the following:  
DOC.energypermitcompliance@state.mn.us or 1-800-657-3794. Voice messages are acceptable.

***Monthly Reports*** – By the 15th of each month, a summary of all complaints, including substantial complaints received or resolved during the preceding month. Such summaries shall be sent to Dr. Burl W. Haar, Executive Secretary, Minnesota Public Utilities Commission, Metro Square Building, 121 7<sup>th</sup> Place East, Suite 350, St. Paul, MN 55101-2147. A copy of each complaint shall be sent to Permit Compliance, Minnesota Department of Commerce, 85 7<sup>th</sup> Place East, Suite 500, St. Paul, MN 55101-2198.

***Unresolved Complaints*** – The permittee shall submit all unresolved complaints to the PUC for resolution by the PUC, where appropriate, no later than 45 days after the date of the submission.

## **7. Complaints Received by the PUC**

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

***Initial Screening*** – Commission staff shall perform an initial evaluation of unresolved complaints submitted to the Commission. Complaints raising substantive routing permit issues shall be processed and resolved by the Commission. Staff shall notify permittee and the complainant if it determines that the complaint is a substantial complaint. With respect to such complaints, each party shall submit a written summary of its position to the Commission no later than ten days after receipt of the staff notification. Staff shall present briefing papers to the Commission, which shall resolve the complaint within twenty days of submission of the briefing papers.

***Condemnation/Compensation Issues*** – If the Commission's staff initial screening determines that a complaint raises issues concerning the just compensation to be paid to landowners on account of permittee acquisition of high voltage transmission line easements, staff shall recommend to the Executive Secretary that the matter be resolved under the provisions of Minnesota Statutes, Chapter 117. If the Executive Secretary concurs, he shall so report to the Commission and the matter shall be dealt with in the high voltage transmission line condemnation proceedings as an issue of just compensation.

**APPENDIX C**  
Applicant Supplied Data

**Table 1**  
**Distance of Existing & Planned Electric Line/Pole from Residences Along 23<sup>rd</sup> North Street<sup>1</sup>**  
**West New Ulm – Fort Ridgely 115/69 kV Transmission**  
**Line Rebuild Project**

<b>Residence Address</b>	<b>Shortest Distance from Line to Residence (ft.)<sup>2</sup></b>	<b>Shortest Distance from Planned New Line to Residence<sup>3</sup> (ft.)</b>	<b>Shortest Distance from Planned New Line with Alternative Design to Residence (ft.)</b>
<b>Properties South of 23<sup>rd</sup> Street North</b>			
701 23 <sup>rd</sup> N. Street	42.5	36	39
703 23 <sup>rd</sup> N. Street	41.5	37	40
Two vacant lots (PID # 001.660.001.03.030)	No residence	No residence	No residence
713 23 <sup>rd</sup> N. Street	46	40	43
717 23 <sup>rd</sup> N. Street	42	36	39
719 23 <sup>rd</sup> N. Street	45	39	42
721 23 <sup>rd</sup> N. Street	43-45 <sup>4</sup>	~37-39 <sup>4</sup>	40-42 <sup>4</sup>
723 23 <sup>rd</sup> N. Street	67	61	64
729 23 <sup>rd</sup> N. Street	42	36	39
900 23 <sup>rd</sup> N. Street (not found in City GIS system)	na	na	na
2227 Terrace Drive	43-45 <sup>4</sup>	42-44 <sup>4</sup>	40-42 <sup>4</sup>

Note: There are 15 residential structures located along 23<sup>rd</sup> North Street from North Broadway Street, through Terrace Drive North to Boundary Street. Nine are located on the south side of 23<sup>rd</sup> N. Street and the remaining six are located on the north side. There is one multi-tenant facility (720 23<sup>rd</sup> N. Street) and at least one duplex.

The Alternative Design referenced in the fourth column is possible mitigation for double circuiting which would place the lines no more than five feet from the face of the pole on the residential side of the pole.

<sup>1</sup> Note: Measurements provided in this table are based on the City of New Ulm/City Engineer Sheet 1 of 4 drawing entitled “Plan and Profile for Sanitary Sewer, Watermain, End Services, Grading, Aggregate Base, Concrete Curb & Gutter, Sidewalk, Driveway and Street Lighting System on 23<sup>rd</sup> North Street from Broadway to 800’ West” dated 2/99 (As-Built by 11/99). The measurements above are +/- 1-2 feet.

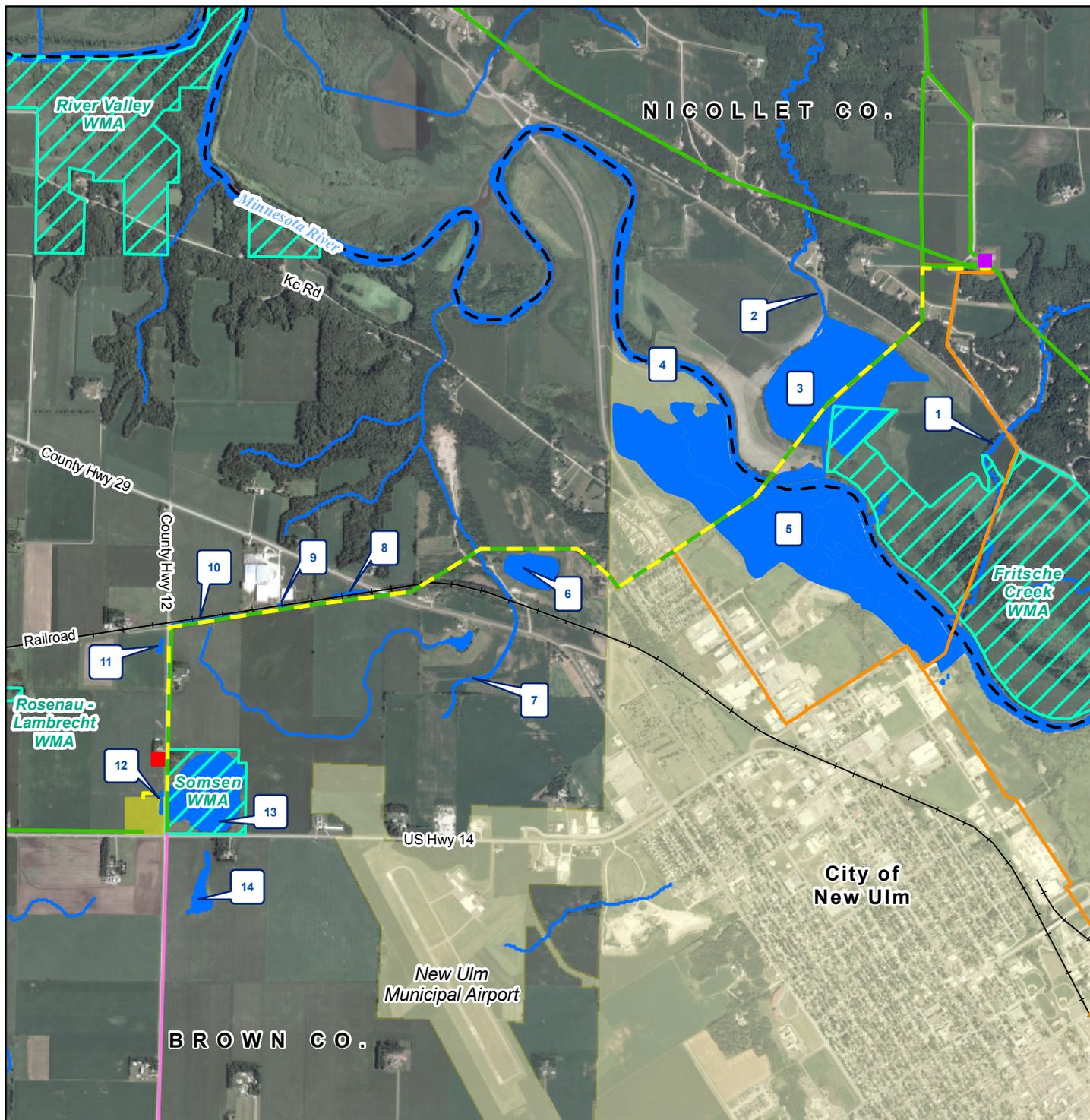
<sup>2</sup> This is on the residential property side of the pole. For existing poles/lines, the existing lines on the residential property side of the pole hang either 1-1.5, 2 or 4.5 or feet horizontally off the face of the pole.

<sup>3</sup> This is on the residential property side of the pole. For planned poles/lines described in the Route Permit Application, the lines on the residential property side of the pole hang 6.5 to 8 feet horizontally off the face of the pole (8 feet is used in the above table).

<sup>4</sup> Residence not shown on 2/99 City Engineer’s map; distances are approximated based on Brown County Assessor information.

NEW ULM Permitting Project - 23rd North Street Segment									
OPTION	DESCRIPTION	115 KV OVERHEAD LINE COST	69 KV OVERHEAD LINE COST	115 KV UNDERGROUND LINE COST	69 KV UNDERGROUND LINE COST	115 KV & 69 KV UNDERGROUND LINE COST	TOTAL OPTION COST	INCREMENTAL COST DIFFERENCE COMPARED TO BASE ESTIMATE	
Incremental Costs of Underground Options along 23rd North Street									
0.26 mile segment length assumed									
Assumed that 3 - 3000 kcmil Cu underground cables per phase are required for ampacity to match 2-795 ACSS 26/7 OH conductor of 115 KV line									
Assumed that 1-1000 kcmil Cu underground cable for 69 KV UG line and 1-1500 kcmil Cu underground cable for 69 KV line of double circuit 69/115 KV UG lines									
	Date: 12/15/2008								
	By: Brad Hill								
BASE	Double circuit 115/69 KV steel poles at existing 69 KV line location along 23rd North Street	\$230,000	\$70,000	N.A.	N.A.	N.A.	\$300,000	N.A.	
UG1	Single circuit 115 KV overhead line and 69 KV underground line along 23rd North Street	\$200,000	N.A.	N.A.	\$1,600,000	N.A.	\$1,800,000	\$1,500,000	
UG2	Single circuit 69 KV overhead line and 115 KV underground line along 23rd North Street	N.A.	\$100,000	\$4,100,000	N.A.	N.A.	\$4,200,000	\$3,900,000	
UG3	Underground 69 KV and 115 KV lines along 23rd North Street	N.A.	N.A.	N.A.	N.A.	\$4,700,000	\$4,700,000	\$4,400,000	

NEW ULM Permitting Project - 23rd North Street Segment									
OPTION	DESCRIPTION	115 KV OVERHEAD LINE COST	69 KV OVERHEAD LINE COST	115 KV UNDERGROUND LINE COST	69 KV UNDERGROUND LINE COST	115 KV & 69 KV UNDERGROUND LINE COST	TOTAL OPTION COST	INCREMENTAL COST DIFFERENCE COMPARED TO BASE ESTIMATE	
Incremental Costs of Underground Options along 23rd North Street									
0.26 mile segment length assumed									
Assumed that 3 - 3000 kcmil Cu underground cables per phase are required for ampacity to match 2-795 ACSS 26/7 OH conductor of 115 KV line									
Assumed that 1-1000 kcmil Cu underground cable for 69 KV UG line and 1-1500 kcmil Cu underground cable for 69 KV line of double circuit 69/115 KV UG lines									
	Date: 12/15/2008								
	By: Brad Hill								
BASE	Double circuit 115/69 KV steel poles at existing 69 KV line location along 23rd North Street	\$230,000	\$70,000	N.A.	N.A.	N.A.	\$300,000	N.A.	
UG1	Single circuit 115 KV overhead line and 69 KV underground line along 23rd North Street	\$200,000	N.A.	N.A.	\$1,600,000	N.A.	\$1,800,000	\$1,500,000	
UG2	Single circuit 69 KV overhead line and 115 KV underground line along 23rd North Street	N.A.	\$100,000	\$4,100,000	N.A.	N.A.	\$4,200,000	\$3,900,000	
UG3	Underground 69 KV and 115 KV lines along 23rd North Street	N.A.	N.A.	N.A.	N.A.	\$4,700,000	\$4,700,000	\$4,400,000	

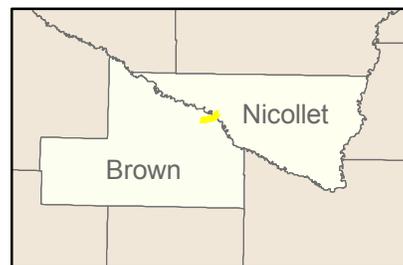


# Proposed West New Ulm Substation and 115/69 kV Transmission Line Rebuild Project

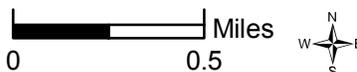
Brown and Nicollet counties, MN

## Legend

- |  |                      |
|--|----------------------|
| Existing Substation - Fort Ridgely               | MN DNR Wildlife Area |
| Existing Substation - Brown Co. REA              | Wetlands/Waterbodies |
| Proposed Xcel Energy West New Ulm Substation     | River/Stream         |
| Proposed Xcel Energy 115/69 kV Transmission Line | Railroad             |
| Xcel Energy Transmission Line                    | County Boundary      |
| GRE Transmission Line                            | City Boundary        |
| New Ulm Public Utilities Transmission Line       |                      |



Data Source(s): Xcel Energy, MN DNR, USDA, National Wetlands Inventory, Westwood.



**Natural Resources Map**  
Appendix B.8