

# **Environmental Assessment**

**Proposed Chandler 115 kV  
Transmission Line Upgrade**

**Murray County, Minnesota**

**Murray County**

***August 2008***

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## List of Acronyms Used in this Document

<b>ACRONYMS</b>	
Commission	Minnesota Public Utilities Commission
CUP	Conditional Use Permit
dB db(A)	Decibel Decibel, A-weighted
DNR	Minnesota Department of Natural Resources
EA	Environmental Assessment
EMF	Electromagnetic fields
EQB	Minnesota Environmental Quality Board
GRE	Great River Energy
kV	Kilovolt
MPCA	Minnesota Pollution Control Agency
NAC	Noise Area Classification
NPDES	National Pollutant Discharge Elimination System
ROW	Right-of-way
SHPO	State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

## 1.0 Introduction

Great River Energy (GRE), wholesale power supplier to Nobles Cooperative Electric and 27 other distribution cooperatives in Minnesota and Wisconsin, is planning to reconstruct and upgrade one mile of existing 69 kV (69,000 volt) overhead electric transmission line to a 115 kV (115,000 volt) transmission line. The line is located along the south side of Section 18 of Fenton Township in Murray County. Due to the age and reliability concerns of this segment of line, it is necessary that it be rebuilt as soon as possible. Due to ongoing load growth in the area along with additional interconnections for wind generation, the line will be permitted, designed and constructed to 115 kV standards. It will continue to operate at 69 kV until the adjoining transmission systems are upgraded to 115 kV (Figures 1-1 and 1-2).

### 1.1 Project Location

The proposed single circuit 115 kilovolt (Kv) transmission line corridor will be located in Section 18, T105N, R42W near Chandler, Minnesota (Figure 1-2).

The reconstructed line will be located on the north side of 31<sup>st</sup> Street. It will tie into an existing two-pole structure in the southwest corner of Section 18 and continue easterly for one mile, where the line will attach to an existing steel pole owned by Xcel Energy located in the southeastern corner of Section 17.

### 1.2 Project Description

Poles will be single-pole structures and will generally be 65 to 75 feet in height and will be located on the same centerline as the existing transmission line. Pole locations may shift on the same centerline, with adequate setbacks from field access roads and driveways considered in new pole placement. Guy wires and anchors may be required in some areas, although they will be minimized to the extent possible to reduce the impact on agricultural activities. All guy wires will have highly visible guy guards as standard equipment. The single circuit transmission lines will carry four wires (three energized and one non-energized for lightning protection).

These components are discussed in more detail in Section 3.





### 1.3 Project Need

Due to the age and reliability concerns of this segment of line, it is imperative that it be rebuilt as soon as possible. To meet current load growth and anticipated future demand for additional interconnections for wind generation in this area, this line will also be designed and constructed to operate at 115 kV.

### 1.4 Project Cost Estimate

The estimated costs for GRE's transmission facilities are \$375,000.

### 1.5 Project Schedule

Permitting activities and the environmental review started in spring 2008 and will continue into fall 2008. Easement acquisition is tentatively scheduled to occur in summer 2008. Construction of the transmission line is proposed to begin in late fall 2008, with an anticipated in-service date of late fall 2008.

## **2.0 Regulatory Framework**

### **2.1 Permit Requirement**

This project falls under the State of Minnesota's Power Plant Siting Act, (Minnesota Statutes § 216E.01-.18 and Minnesota Rules Chapter 7849) for transmission projects over 100 kV and requires a permit from the Minnesota Public Utilities Commission (Commission). However, for eligible projects, a utility may apply to the local unit of government that has jurisdiction over the project for approval instead of applying to the Commission (Minn. Rules 7849.6200). This proposed 115 kV project is eligible for local review.

Murray County has agreed to act as the lead local unit of government with jurisdiction to approve the project. The County was afforded the opportunity to relinquish its jurisdiction by requesting that the Commission assume jurisdiction, but has elected to maintain jurisdiction of the project. As required by Minn. Rules 7849.6200 Subp.3, GRE notified the Commission that it intended to seek local approval of the project (see Appendix A).

### **2.2 Environmental Assessment Requirement**

In accordance with Minn. Rules 7849.6200 Subp.5, an environmental assessment (EA) prepared by the local unit of government with jurisdiction over the project must be completed. The EA contains information on the human and environmental impacts of the proposed project and addresses methods to mitigate such impacts.

When the EA is complete, Murray County must publish a notice in the Environmental Quality Board (EQB) Monitor that the EA is available for review, how a copy of the document may be reviewed, that the public may comment on the document, and the procedure for submitting comments to the County. A final decision on the project cannot be made until at least ten days after the notice appears in the EQB Monitor.

### **2.3 Scoping of Environmental Assessment/Public Participation**

The rules require that the public be afforded the opportunity to participate in developing the scope of the EA before it is prepared.

A survey on the project was sent by Murray County to all landowners along the proposed corridor on July 21, 2008 to satisfy the requirement in the rules for public involvement in preparation of the environmental assessment. The survey and responses received are provided in Appendix B.

The Conditional Use Permit (CUP) request process is also open to the public as part of the respective review by the Murray County Planning Commission at its regularly scheduled meetings. Prior to the public hearing, notices are sent out to landowners located within one-quarter mile of the project corridor or the ten closest neighbors to the project, whichever is greater. Public hearing notices are published in the Murray County official newspapers.

## 2.4 Conditional Use Permit

Murray County is the legal governing body for all activities that may require permitting in the area. Murray County requires a CUP for this project. GRE submitted a CUP Application to Murray County on July 21, 2008. As required by Minn. Rules 7849.6200 Subp.3, GRE mailed notice of the project to those persons on the Power Plant Siting General Notification list (see Appendix A).

Typically it takes 60 days to have the project approved by the legal governing body. The Murray County Board will first need to approve the EA before presenting it to the public. Once the EA is approved, the 60 days will resume for the approval of the CUP.

After the EA is finalized, notice of the EA has been published in the EQB Monitor, and the comment period requirements have been met, Murray County will hold a public hearing and make a decision on GRE's request for a CUP.

### **3.0 Engineering Design, Right-of-Way Acquisition, and Construction**

#### **3.1 Transmission Line**

The upgraded transmission line will be a single circuit design (Figure 3-1), consisting of three phase wires and a shield wire for lightning protection. The line starts at an existing two-pole structure, runs down the transmission corridor, connects to structures along the route, and terminates on an existing steel pole owned by Xcel Energy.

The line will be constructed with 795 ACSS conductor supported by single wood poles that will be 60-75 feet in height. The spacing between the new poles will be approximately 350 feet.

The line will be primarily self-supporting and guyed wood structures. All guy wires will have highly visible guy guards as standard equipment. In some cases engineered poles such as laminated wood or tubular steel may be used.

#### **3.2 Right-of-Way Acquisition**

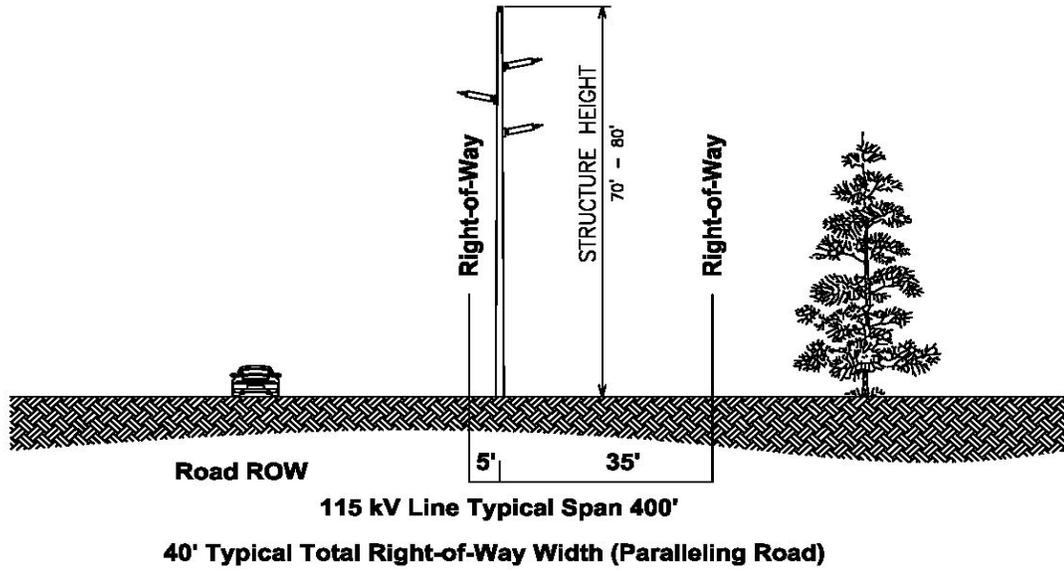
After project approvals to reconstruct the transmission line are secured, landowners will be contacted by representatives of GRE to begin direct negotiations to acquire easements and purchase any land rights necessary for the transmission line upgrade. As the design of the line is developed, landowners will be contacted to discuss the project in detail and in preparation for any necessary surveys and soil investigations.

Once easements, permits and land rights have been acquired, and immediately prior to construction, individual property owners will be contacted to discuss construction schedules, access to the site and vegetation clearing required for the project. The right-of-way (ROW) would be cleared of the amount of vegetation necessary to construct, operate and maintain the proposed transmission line. Wood from the clearing operation will be offered to the landowner or removed from the site. Brush will be chipped and disposed of on the ROW. It is standard practice to remove any vegetation species that would be a danger to the line when at a mature height. Also, any vegetation that is in the way of construction equipment may have to be removed.

Some structure locations may require soil analysis to assist with the design of the line. Soil borings would be taken to determine the soil properties for engineering analysis. An independent geotechnical testing company would take and analyze these borings. Site access would be required and landowners would be contacted for permission.

Figure 3-1

**115 kV Horizontal Post Structure**



In addition to the ROW required for adequate clearance of the proposed transmission line upgrade, temporary construction easements may be obtained from landowners for the duration of construction. These construction easements would need to be limited to special construction access needs or any additional staging or laydown areas required outside of the proposed transmission line ROW. Where possible, staging and laydown areas would be located within the ROW and limited to previously disturbed or developed areas. Upon completion of construction activities, landowners will be contacted to determine if any additional restoration due to construction damage is necessary.

### 3.3 Construction and Maintenance Procedures

Construction is planned to begin in late fall 2008, depending on when required approvals are obtained and easement acquisition is completed. The proposed transmission line would be reconstructed at grade elevations; therefore, no pole locations would require grading unless it is necessary to provide a level area for construction access and activities. Construction would comply with the latest industry standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, ROW widths, erecting power poles, and stringing of transmission line conductors.

Typical pole structures would require a hole dug 10 to 15 feet deep and 3 to 4 feet in diameter for each pole. Pole structures in wet environments or angle structures may require additional foundation support, typically consisting of a concrete foundation or placement of the pole base inside a vertical galvanized steel culvert. Erosion control methods would be implemented to minimize runoff during construction. GRE or an approved GRE contractor would perform transmission line construction in compliance with local, state, National Electrical Safety Code, and industry standards.

Poles would be delivered to either the staked location or a project storage yard. If the poles were delivered to a staked site, they would be placed on the ROW out of the clear zone of any adjacent roadways or designated pathways. Insulators and other hardware would typically be attached while the pole was on the ground. The pole would then be lifted, placed and secured on the foundation by a bucket truck or crane.

Once the structures have been erected, conductors would be installed by establishing stringing setup areas within the ROW. The stringing setup areas would usually be established every two miles along the project route. Conductor stringing operations also require brief access to each structure to secure the conductor wire to the insulators or to install shield wire clamps once final sag is established. Temporary guard or clearance poles would be installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways or other obstructions after any necessary notifications were made or permits obtained. This ensures that conductors would not obstruct traffic or contact existing energized conductors or other cables. In addition, the conductors would be protected from damage.

GRE would periodically use the transmission line ROW to perform inspections, maintain equipment, and repair any damage. GRE would also conduct regular route maintenance for weed control and removal of undesired vegetation that would interfere with the operation of the proposed transmission line.

During construction, limited ground disturbance at the structure sites may occur. Disturbed areas would be restored to their original condition to the maximum extent practicable as negotiated with the landowner. Post-construction reclamation activities include:

- removing and disposing of debris,
- removing all temporary facilities (including staging and laydown areas),
- employing appropriate erosion control measures,
- reseeding and mulching areas disturbed by construction activities with vegetation similar to that which was removed and,
- restoring the areas to their original condition to the extent possible.

In cases where soil compaction has occurred, the construction crews or a restoration contractor use various methods to alleviate the compaction as negotiated with landowners.

A preconstruction meeting will be held with Murray County prior to construction.

## **4.0 Assessment of Impacts and Mitigation**

The majority of the proposed project is located along existing road or utility ROWs and impacts to the environment are expected to be minimal and short-term, therefore little mitigation will be required. GRE will minimize negative environmental impacts during construction of the project.

Correspondence relative to environmental conditions at the proposed site and responses received from state and federal agencies that reviewed the project are provided in Appendix C.

### **4.1 Description of Environmental Setting**

The proposed transmission line corridor is located in an area that is mainly agricultural and wind turbine generation (Figure 4-1).

### **4.2 Impacts on Human Settlement**

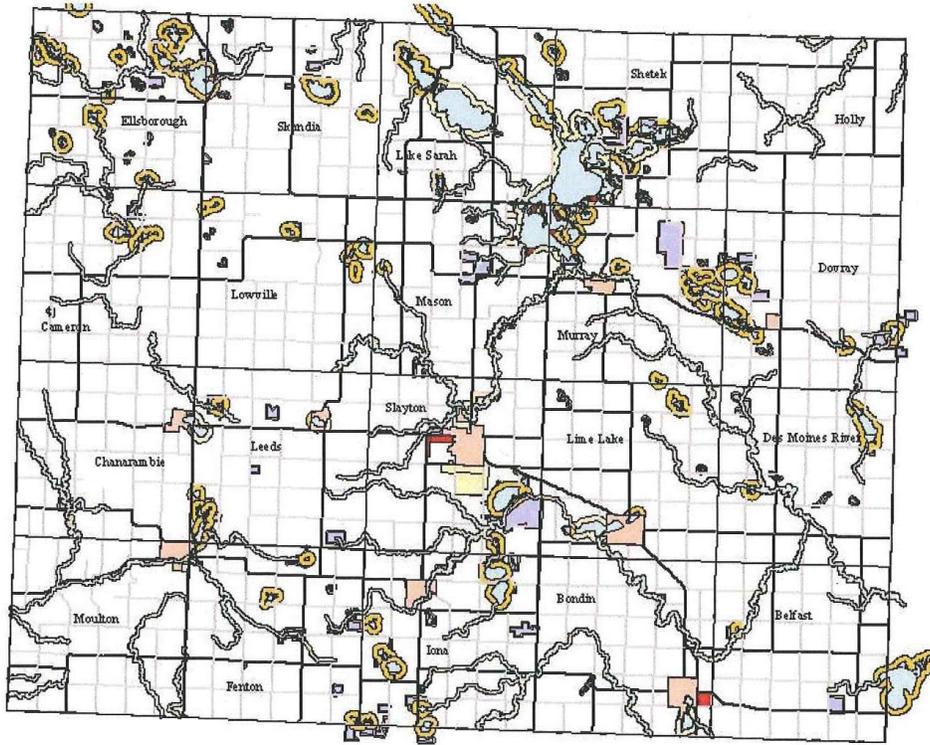
#### **4.2.1 Socioeconomics**

The local economy is based primarily on agriculture and small businesses. Approximately 5-10 workers will be required for construction of the new line. During construction, there would be a small impact on the local community due to revenue created from expenditures of the construction crew (local community services, hotels, restaurants, construction materials). No permanent jobs will be created by this project.

#### **4.2.2 Displacement**

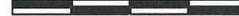
The reconstructed transmission line will not cause the displacement of any residence and will not affect any public services.

**Figure 4-1 Murray County Zoning Map**



**Murray County Zoning Map**

0 2 4 6 8 Miles



- Townships
- Public Water Basins
- Public Water Courses
- Shoreland - Courses
- Cities
- Shoreland Districts**
- General Use
- Residential
- Special Protection
- Water Oriented Commercial
- DIIR Wetlands, WMA, WPA, SIA
- Special Protection DIIR
- Zoning Districts**
- Agricultural
- General Business
- Industrial
- Rural Residential



Prepared By: Murray County  
Environmental Services  
Date Adopted: December 29, 2005  
Date Printed: April 2, 2008

### 4.2.3 Noise

Noise is comprised of a variety of sounds of different intensities, across the entire frequency spectrum. Humans perceive sound when sound pressure waves encounter the auditory components in the ear. These components convert these pressure waves into perceivable sound. Transmission conductors and transformers at substations produce noise under certain conditions. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight". The A-weighted scale (dBA) corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA, the A-weighted sound level recorded in units of decibels. A noise level change of 3 dBA is barely perceptible to human hearing. A 5-dBA change in noise level, however, is clearly noticeable. A 10-dBA change in noise levels is perceived as a doubling of noise loudness, while a 20-dBA change is considered a dramatic change in loudness. Table 4-1 below shows noise levels associated with common, everyday sources. Noise levels for a 115 kV transmission line would be between 0 and 18 dBA, depending on the weather.

**Table 4-1**

**Common Noise Sources and Levels**

<b>Sound Pressure Level (dB)</b>	<b>Typical Sources</b>
120	Jet aircraft takeoff at 100 feet
110	Jet aircraft at 400 feet
90	Motorcycle at 25 feet
80	Garbage disposal
70	City street corner
60	Conversational speech
50	Typical office
40	Living room (without TV)
30	Quiet bedroom at night

Source: Environmental Impact Analysis Handbook, ed. By Rau and Wooten, 1980

In Minnesota, state rules have been established to regulate noise levels by land use types. Land uses such as picnic areas, churches or commercial land are assigned to an activity category based on the type of activities occurring in each respective land use. Activity categories are then categorized based on their sensitivity to traffic noise. The Noise Area Classification (NAC) is listed in the Minnesota Pollution Control Agency (MPCA) noise regulations to distinguish the categories.

Noise emission from a transmission line increases during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a crackling sound due to the small amount of electricity ionizing the moist air near the wires. During heavy rain, the general background noise level is usually greater than the noise from the transmission line and few people would be out near the transmission line. As a result, people do not normally notice audible noise from a transmission line during heavy rain. This is confirmed by calculated levels during a heavy rain (one inch per hour) that shows noise levels for a 115 kV line at less than 25% of the most sensitive state NAC (NAC 1). During light rain, dense fog, snow, and other times when there is moisture in the air, transmission lines will produce audible noise at approximately household background levels. During dry weather, audible noise from transmission lines is barely perceptible.

#### 4.2.4 Aesthetics

Because the proposed project is an upgrade of an existing transmission line that follows a road corridor, it will have minimal impact on the aesthetics of the area.

#### 4.2.5 Human Health and Safety

No threats to public health and safety are anticipated for this project. All facilities will be constructed in accordance with all applicable standards, including the National Electric Safety Code and other industry standards. Construction personnel will be required to follow Occupational Safety and Health Administration regulations. Other safety measures such as warning signs, fencing, and gates will be utilized as needed.

#### Electric and Magnetic Fields

Questions often arise about electric and magnetic fields (EMF), which are invisible lines of force that surround any electrical device. The term EMF refers to electric and magnetic fields that are coupled together such as in high frequency radiating fields. For lower frequencies such as for power lines, EMF should be separated into electric fields and magnetic fields. Transmission lines operate at a frequency of 60 hertz (cycles per second), which is in the non-ionizing portion of the electromagnetic frequency spectrum. Fields are considered ionizing when they cause electrons to eject from their orbits around a normal atom. This will typically occur with frequencies in the range of  $10^{16}$  to  $10^{22}$  hertz.

Magnetic fields result from the flow of electricity (current) in the transmission line. The intensity of the magnetic field is related to the current flow through the conductors. The magnetic field associated with the transmission line surrounds the conductor and rapidly decreases with the distance from the conductor. The value of the magnetic field density is expressed in the unit of gauss or milligauss.

The most recent and exhaustive studies of the health effects from power frequency fields conclude that the evidence of health risk is weak. Some of these studies are listed below:

- National Institute of Environmental Health Sciences. 2002. *EMF. Electric and Magnetic Fields Associated with the Use of Electric Power*. National Institutes of Health.
- National Research Council. 1997. *Possible Health Effects of Exposure to Residential Electric and Magnetic Fields*.
- Minnesota Department of Health. 2002. *EMF White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*.

For this project, the overall EMF impact should be minimal because the transmission corridor either avoids residences or is set back far enough that magnetic fields will be minimal.

#### 4.2.6 Public Services

Impacts to other utilities (gas, telephone, electric, water, sewer) will be avoided or minimized. Public services would not be affected by the construction and operation of the proposed transmission line.

### 4.3 Impacts on Land-based Economies

#### 4.3.1 Recreation/Tourism

The proposed project is not within any recreational areas and will not affect recreational or tourism opportunities.

#### 4.3.2 Agriculture

The proposed project would impact some farmland; however, most of the disturbance will be limited to the area immediately surrounding the transmission structures. Guy wires and anchors may be required in some areas, although they will be minimized to the extent possible to reduce the impact on agricultural activities. All guy wires will have highly visible guy guards as standard equipment. GRE will work with landowners to minimize impacts to farmland. This would include scheduling work to minimize impacts to crops and land. GRE representatives would work directly with landowners to address crop damages or impacts to farmland. In cases where soil compaction occurs; the construction crews or a restoration contractor would use various methods to alleviate the compaction as negotiated with landowners.

### 4.3.3 Transportation

The existing transmission line that will be rebuilt parallels road ROW. Temporary road closures or lane reductions are not planned during construction of the transmission line. If it is deemed necessary, proper authorities will be contacted prior to any action. Operation of the proposed transmission line will not affect the major roads in the area (State Highway 91).

The proposed project is over seven miles from the nearest private and commercial airports (Dairyview Private Airport and Slayton Municipal Airport). The Minnesota Department of Transportation, Division of Aeronautics was contacted regarding any potential impacts to airports in the vicinity. An email reply dated June 12, 2008 indicated that the project is well clear of any state-funded airports (Appendix C).

### 4.3.4 Mining and Forestry

There are no mining or forested areas in the vicinity of the project.

### 4.3.5 Archaeological and Historic Resources

A literature review of the project area was conducted in June 2008 by HDR Engineering (HDR). In this review, it was noted that six sites have been reported in the project area (but a considerable distance from the proposed rebuild) but not field verified. The project area has not been previously surveyed for cultural resources. However, given the disturbed nature of the current land use and the fact that the known sites are not near the transmission line rebuild, GRE believes that there will be no impacts to archaeological and historic resources. HDR's report has been sent to the Minnesota Historical Society State Historic Preservation Office (SHPO) (Appendix C).

## 4.4 Natural Environment

### 4.4.1 Air Quality

Because transmission lines do not affect air quality, there will be no long-term environmental impacts on the air from operation of the transmission line.

During construction of the proposed transmission line, there would be emissions from vehicles and other construction equipment and fugitive dust from ROW clearing. Temporary air quality impacts caused by the proposed construction-related emissions would be expected to occur during this phase of activity. The magnitude of these emissions is influenced heavily by weather conditions and the specific construction activity taking place. Adverse impacts to the surrounding environment would be minimal because of the short and intermittent nature of the emission and dust-producing construction phases.

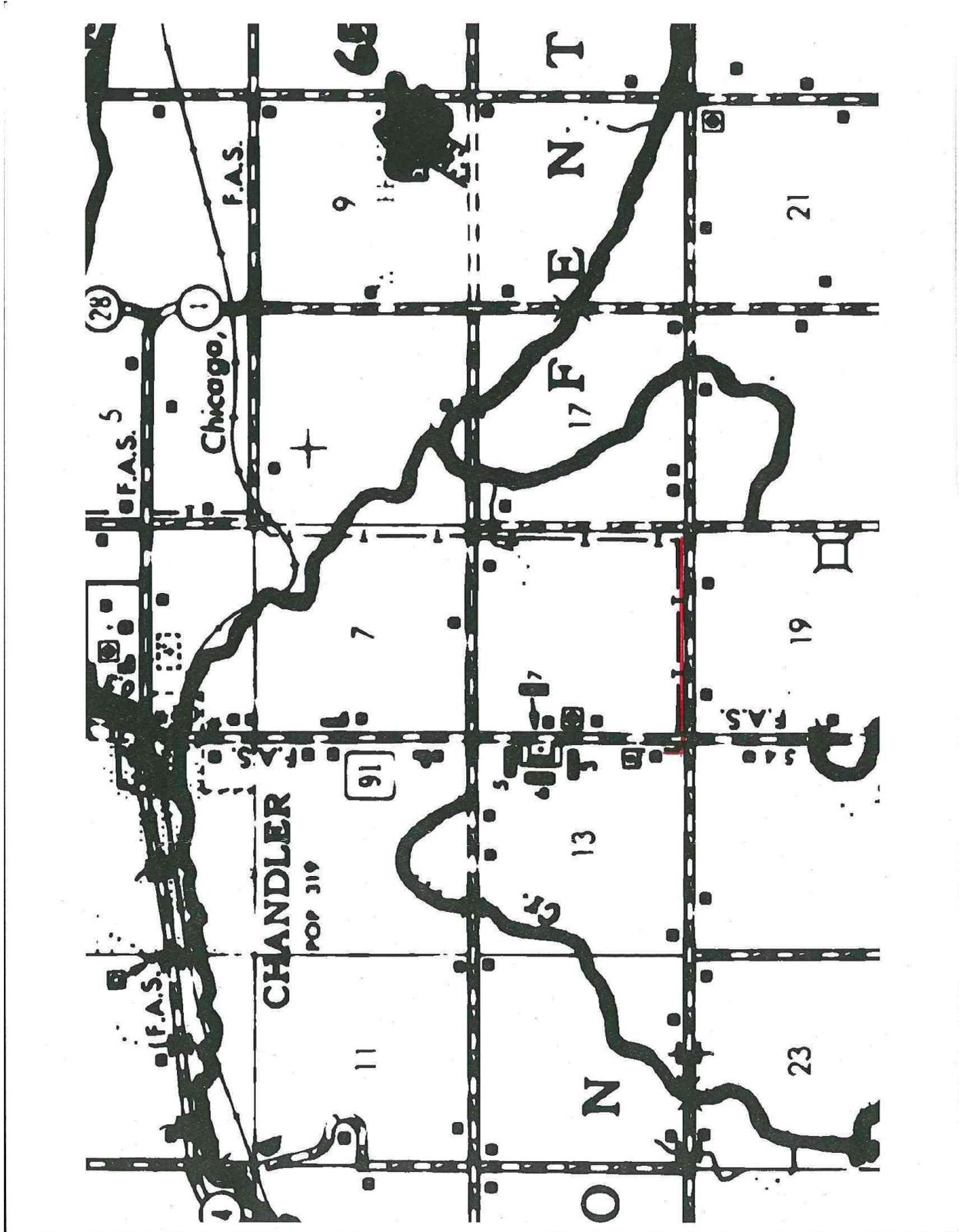
#### 4.4.2 Water Resources, Wetlands and Soils

Minimal impacts to water resources are anticipated. The proposed transmission line will not cross Minnesota Department of Natural Resources (DNR) Public Waters as shown on Figure 4-2.

The US Army Corps of Engineers (USACE) was contacted regarding this project and they sent a letter dated May 9, 2008 stating that the proposed location “is not within the regulatory jurisdiction of the Corps of Engineers. No work will be done in a navigable water of the United States, and no dredged or fill material, including that incidental to mechanical land clearing, will be discharged in any water of the United States, including wetlands.” A permit will not be required by the USACE (Appendix C).

Soils along the transmission route are generally clay loams, silty clay loams and loams.

Figure 4-2 DNR Public Waters Map

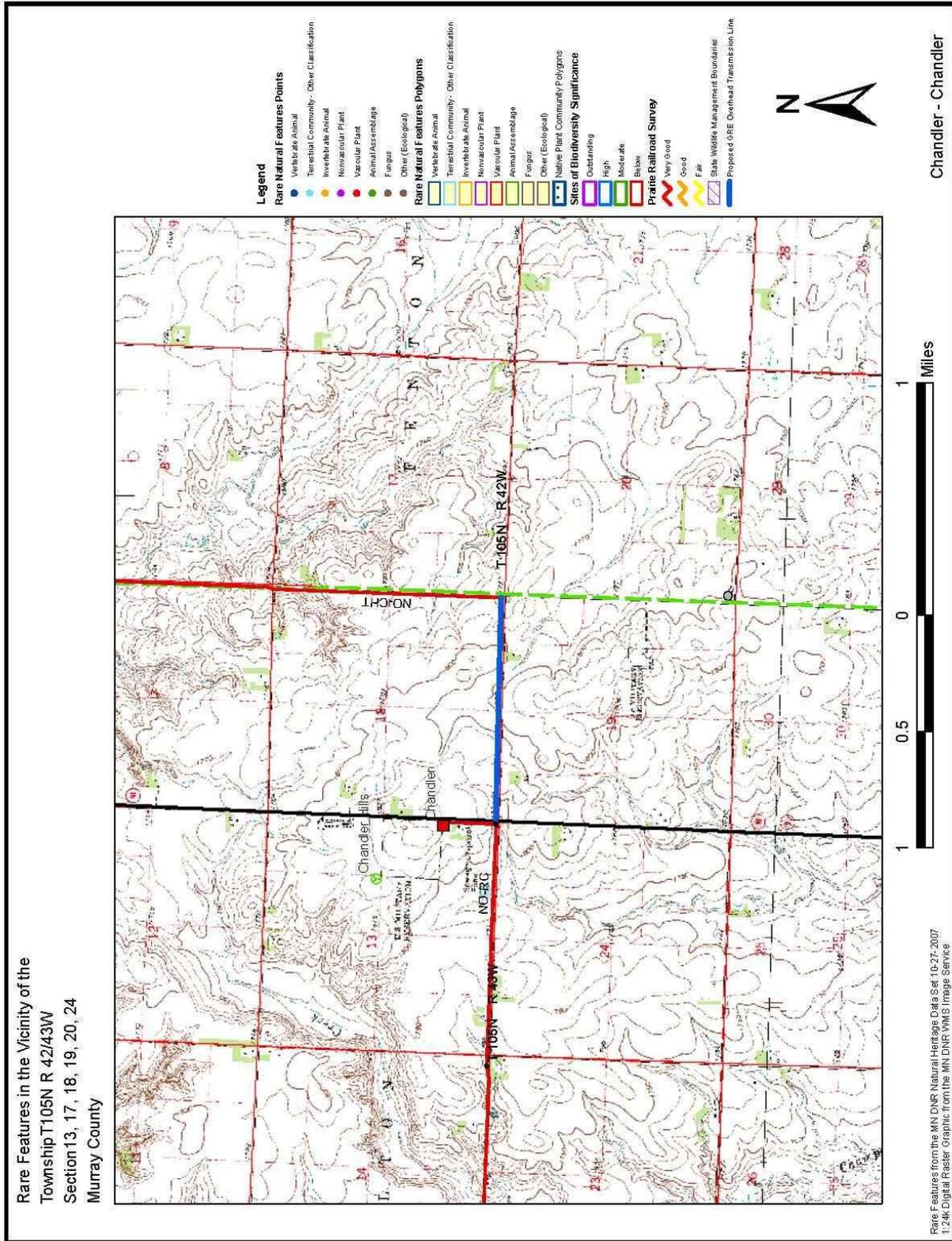


#### 4.4.3 Vegetation and Wildlife/Rare and Unique Natural Resources

The DNR and the United States Department of the Interior Fish and Wildlife Service (USFWS) were contacted regarding vegetation and wildlife resources in the vicinity of the project.

In an email dated 5/23/08 (Appendix C), the DNR indicated that they concur with the assessment that there are no known occurrences of rare features within an approximate one mile radius of the project (Figure 4-3). The USFWS (e-mail of 5/29/08, Appendix C) indicated that there are no known federally listed species or critical habitat in the project area.

Figure 4-3 Rare Features Map



## 5.0 Regulatory Permits and Approvals Required

Permit requirements or approvals anticipated for this project and the status of each are shown below in Table 5-1.

**Table 5-1 Regulatory Permits and Approvals Required**

Government Unit	Type of Approval	Regulated Activity	Status
US Dept. of Interior Fish and Wildlife Service	Threatened and Endangered Species Review	Review of records for federally threatened or endangered species that may exist at or near the proposed transmission facilities	May 29 <sup>th</sup> email stated that there are no known federally listed species or critical habitat in the project area.
US Dept. of the Army Corps of Engineers	Wetland and Waterways Review	Review navigable water and the dredging or filling of US waters including wetlands	May 9 <sup>th</sup> letter states that there are no navigable waters in the area. USACE has no jurisdiction.
MN Dept. of Natural Resources (DNR)	Environmental Review – Wetlands, Water, Threatened and Endangered Species; Trails	Comprehensive review of transmission line impacts	May 23 <sup>rd</sup> email concurred that there are no known occurrences of rare features within an approximate one mile radius of the project.
MN Historical Society State Historic Preservation Office (SHPO)	SHPO Review of Nationally Registered Historic Places	Historic preservation	A literature survey of cultural resources was completed in July 2008 and the report was sent to SHPO.
MnDOT – Aeronautics Division	Airspace Concerns	Public and private airports/airstrips	June 12 <sup>th</sup> email states that it will not adversely affect operations at the nearest public airport in Slayton. The Office of Aeronautics is unaware of any private airports that would be affected. MN Aerial Applicators Association was sent a copy of the GRE letter.
Minnesota Pollution Control Agency (MPCA)	NPDES Permit	SWPPP and stormwater permit required for disturbance of $\geq$ one acre	None required.
MnDOT	State Highway Crossing Permit	Permit required prior to construction	Appropriate permits will be applied for any construction over state highways.
DNR Lands and Minerals	License to Cross Public Water	License required if project crosses DNR Public Waters	None required.
DNR Lands and Minerals	License to Cross Public Land	License required if project crosses DNR Land	None required.
Fenton Township	Township Road Crossing Permit	Any permit required prior to construction.	Appropriate permits will be applied for any construction over township roads.
Murray County Highway Department	County Road Crossing Permit	Any permit required prior to construction.	Appropriate permits will be applied for any construction over county roads.
Murray County	Conditional Use Permit	Construction of new facilities	Process initiated

# **APPENDIX A**

## **LEGAL NOTICES AND MEDIA INFORMATION**

**APPENDIX B**

LANDOWNER SURVEY

RESPONSES TO SURVEY

GREAT RIVER ENERGY REPLIES TO LANDOWNERS

## **APPENDIX C**

### AGENCY CORRESPONDENCE