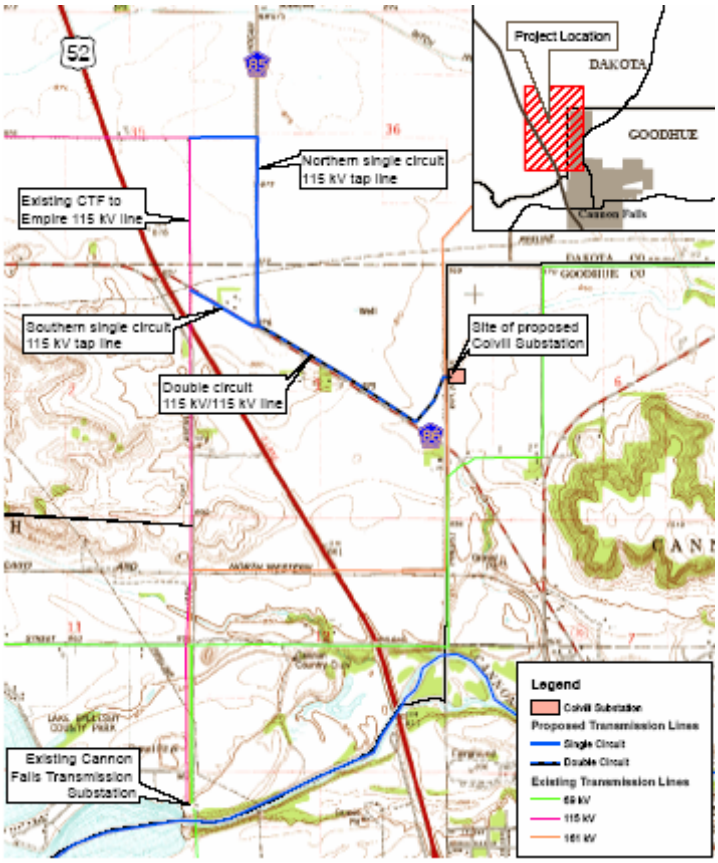
ENVIRONMENTAL ASSESSMENT

CANNON FALLS TRANSMISSION PROJECT
HIGH VOLTAGE TRANSMISSION LINE

PUC DOCKET NO. E002/TL-06-459



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OVERVIEW

The Project. Xcel Energy filed the HVTL route permit application on April 25, 2006; Xcel Energy proposes construction of a 0.98 mile (5,170 ft) double circuit 115 kV/115 kV transmission line, 1.3 miles (6,945 ft) of two single circuit 115 kV transmission lines and the construction of a 161 kV/115 kV substation. The new substation, identified as the Colvill Substation, will be located within the CFEC property. The proposed Cannon Falls Transmission project is required to support the interconnection of the Cannon Falls Energy Center.

Certificate of Need. The proposed 115 kV transmission line does not qualify as a "large energy facility" because it is less than 10 miles long (Minn. Stat. 216B.2421, subd. 2(3)). Therefore, no CON is required for the proposed project.

Regulatory process. Xcel Energy notified the PUC by letter dated March 20, 2006, that the Company intended to utilize the Alternative Permitting Process for the proposed Cannon Falls Transmission Line Project. This complies with the requirement of Minn. R. 4400.2000, subp. 2, to notify the PUC at least 10 days prior to submitting an application (The Power Plant Siting Act identifies the projects that qualify for review under the Alternative Review Process. Minn. Stat. 116C.575, subd. 20.

Xcel Energy filed the HVTL route permit application on April 25, 2006.

The application will be reviewed under the Alternative Review Process (Minnesota Rules 4400.2010) of the Power Plant Siting Act (Minnesota Statutes 116C.51 to 116C.69). Under the Alternative Review Process, an applicant is not required to propose any alternative sites or routes. The Department of Commerce Energy Facility Permitting Staff prepares a document called an Environmental Assessment, and a public hearing is required but it need not be a contested case hearing. The PUC has six months to reach a decision under the Alternative Process from the time the application is accepted.

The official process begins with the determination by the PUC that the application is substantially complete, which the PUC did during its May 4, 2006 meeting. The final route permit decision must be made by September 4, 2006.

Environmental Assessment. In the Environmental Assessment, the DOC EFP staff evaluates the potential impacts of the project along the route proposed by the applicant and at possible alternative sites that are identified and discusses ways to mitigate these potential impacts. The public is given an opportunity to participate in the development of the scoping decision, which identifies the alternatives and impacts that will be evaluated in the Environmental Assessment.

Major Decisions. The PUC must determine whether to grant a Route Permit to Excel Energy for the construction of a High Voltage Transmission Line (HVTL) along the proposed route. The only route under review in this proceeding is that proposed in Xcel Energy's HVTL Application dated April 25, 2006.

The PUC could include conditions in any Route Permit it issues for the Cannon Falls Transmission Project if certain conditions are necessary and appropriate.

Public Hearing. The PUC is required to hold a public hearing on the application for a route permit (Minn. Stat. § 116C.575, subd. 6). The hearing is tentatively scheduled for the week of August 7, 2006, in Cannon Falls. A member of the DOC EFP staff will preside at the hearing.

Interested persons will have an opportunity at the hearing to ask questions about the project and to make comments that will become part of the administrative record. The hearing examiner shall ensure that the record created at the hearing is preserved and transmitted to the board. The hearing examiner shall not prepare a report or make any recommendation to the board unless the chair or the board requests the hearing examiner to do so.

1.0 INTRODUCTION

On March 30, 2005, the Environmental Quality Board issued a Large Electric Power Generating Plant (LEPGP) Site Permit to Invenergy Cannon Falls, LLC (EQB Docket No. 04-85-PPS-Cannon Falls EC) to construct and operate a LEPGP in Cannon Falls, Minnesota. The Cannon Falls Energy Center (CFEC) will consist of two simple cycle combustion turbines. The nominal capacity of the facility will be 357 MW. The primary fuel will be natural gas with low sulfur distillate fuel oil as a backup.

The Cannon Falls Energy Center is being developed under an executed power purchase agreement between Invenergy Cannon Falls, LLC and Northern States Power d/b/a Xcel Energy. The entire output of the CFEC is dedicated to meet the PUC approved need (In the Matter of Northern States Power Company's Application for approval of its 2000-2014 Resource Plan) and therefore did not require a Certificate of Need (CON).

The proposed Cannon Falls Transmission project is required to support the interconnection of the Cannon Falls Energy Center.

1.1 Project Description

Xcel Energy proposes construction of a 0.98 mile (5,170 ft) double circuit 115 kV/115 kV transmission line, 1.3 miles (6,945 ft) of two single circuit 115 kV transmission lines and the construction of a 161 kV/115 kV substation. The new substation, identified as the Colvill Substation, will be located within the CFEC property (**Figure 1**).

The proposed transmission line will be designed to meet or surpass all relevant local and state codes, and North American Electric Reliability Council (NERC) 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.

Right of Way

The new 115 kV/115 kV transmission line will parallel existing roadway right-of-way (ROW) for approximately 78 percent of the proposed route. Xcel Energy will acquire a 40-foot ROW (**Figure 2**) adjacent to roadways. Approximately 0.51 mile of the new transmission route will go cross-country and will require a 75-foot ROW (**Figure 3**).

A summary of the ROW requirements is presented in **Table 1**.

Transmission Structures

For the single circuit portion of the lines, the structures are proposed to be galvanized steel, single circuit poles with horizontal line posts (**Figure 4**).

Figure 5 depicts the double circuit structures that are proposed to be used for the 115 kV/115 kV line. The double circuit line will be constructed with galvanized steel single poles with davit arms.

Transmission Capacity

The conductors on the double-circuit line will be 477 kcmil 26/7 ACSS on the circuit going toward Empire (north circuit route), and 477 kcmil 26/7 ACSR on the circuit going toward Cannon Falls (south circuit route).

Table 2 summarizes the engineering and operational design of the HVTL.

Construction Procedures

Construction and mitigation practices are developed early in the project planning process and often rely on industry specific Best Management Practices (BMPs) that have been developed over the years in consultation with appropriate agencies and affected property owners. These BMPs have been developed for ROW clearance, erecting power poles, and stringing power lines. BMPs include schedules for activities, prohibitions, maintenance guidelines, inspection procedures, and other practices. For example, in the case of wetlands, such practices include avoiding wetlands, controlling soil loss, and minimizing the impacts on hydrologically connected surface and groundwater and on the plants and animals that the water supports.

Transmission structures are generally designed for installation at existing grades. Therefore, structure sites will not be graded or leveled, unless it is necessary to provide a reasonably level area for construction access and activities. Once construction is completed, any graded area will be restored to its original contour to the extent practicable.

The steel poles for the single circuit 115 kV line are approximately 2 to 3 feet in diameter. Each pole will be directly imbedded and will require a hole dug 15 to 30 feet deep and 3 to 4 feet in diameter. A culvert will be placed in the hole and the pole will be set within the culvert and backfilled with crushed rock. The steel poles for the double circuit 115 kV/115 kV line will be supported by concrete pier foundations approximately 5 to 7 feet in diameter.

Any structures located in poor or wet soil conditions may require a specially engineered foundation (such as a steel caisson) that would be vibrated into the ground. The poles will then be placed within the caisson.

After structures have been erected, conductors are installed by establishing stringing setup areas within the ROW. Conductor stringing operations will also 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 construction, temporary removal or relocation of certain fences may occur, and installation of temporary (or permanent at land owner request) gates may be conducted. Xcel

Energy will coordinate with the landowner for early harvest of crops where possible, and removal or relocation of equipment and livestock from the ROW may occur.

Limited ground disturbance at the structure sites is anticipated during construction. A main marshaling yard for secure, temporary storage of materials and equipment will be established on a temporary easement and will include sufficient space to lay down material and hardware. Disturbed areas will be restored to their original condition to the maximum extent practicable.

Post-construction reclamation activities include cleaning up all construction sites, including removing and disposing of debris; removing all temporary facilities, including access trails and staging and laydown areas; employing appropriate erosion control measures and reseeding disturbed areas.

Once construction is completed any affected landowners will be contacted by Xcel Energy to determine if any damage has occurred as a result of the utility's project. If damage has occurred to crops, fences, or the property, Xcel Energy will compensate the landowner for the damages caused. An outside contractor may be contracted to restore the damaged property to as near as possible to its original condition.

ROW Maintenance

Periodic access to the ROW of the completed transmission lines will be required to perform inspections and conduct routine maintenance. Regular maintenance and inspections will be performed during the life of the facility to ensure its continued integrity. Periodic inspections will be performed by ground personnel. Inspections will be limited to the ROW. If problems are found during inspection, repairs will be assigned to construction crews.

The ROW will continue to be managed to remove vegetation that interferes with the operation and maintenance of the line. Vegetation management is typically reviewed on a five-year cycle. ROW clearing practices include a combination of mechanical and hand clearing, along with herbicide application to remove or control the growth of vegetation in some areas.

Colvill Substation

Xcel Energy will construct the new Colvill Substation approximately 1,000 feet north of the intersection of Rochester Boulevard/County Highway 29/County Highway 86 on a 58-acre parcel in the NW ¼ of Section 6 of Cannon Falls Township (Township 112, Range 17). The new substation is approximately 2 miles north of the CFT Substation, and is located immediately east of the existing CFT to Spring Creek 161 kV transmission line. Approximately 2.3 acres (300 feet by 330 feet) will be fenced for the substation.

The substation will be designed to accommodate the new 115 kV in and out tap of the CFT to Empire 115 kV line. The existing CFT to Spring Creek 161 kV line will be split and terminated in the new Colvill Substation as part of a separate project. From the CFT Substation to the

Colvill Substation, the line will be reenergized at 115 kV. From the Colvill Substation to Spring Creek, the line will be re-energized at 161 kV.

The substation will include the following design components:

- A 115 kV 5-position ring bus
- A 161 kV bus (1-position)
- One 161 kV/115 kV 187 MVA autotransformer
- Construction of a control house to house the necessary control, relaying and communications equipment.
- New concrete foundations will be installed to support the control house and electrical equipment such as transmission line structures and dead ends, transformers, breakers, and switches.

Plans for the substation location and layout are on **Figure 6**.

1.2 Project Location

The proposed Project is located in Cannon Falls, Minnesota in Dakota and Goodhue counties, in the townships, ranges, and sections identified in **Table 3**. **Figure 7** identifies the project location.

The proposed project involves tapping the existing Cannon Falls Transmission (CFT) line to Empire 115 kV transmission line in two locations. These taps will involve the construction of two new single circuit 115 kV transmission lines which join east of County Road 85 and become a double circuit 115 kV/115 kV transmission line terminating at the new Colvill Substation (on the CFEC propoerty). The northern 115 kV tap will total approximately 1.0 mile long; whereas, the southern 115 kV tap will total approximately 0.3 mile long. The existing 0.6 mile portion of the CFT to Empire 115 kV transmission line between each of the taps will be removed.

The northern line will tap the existing CFT to Empire 115 kV transmission line where it currently heads south in Section 35, Township 113, Range 18 (approximately 0.3 mile west of Trunk Highway (TH) 52). The line will continue east cross country from the tap for 0.27 mile, to County Road 85, where the line will turn south. The new single circuit 115 kV transmission line follows the east side of County Road 85 for approximately 0.74 mile until it joins the southern tap at the junction of County Roads 85 and 86. The northern line continues as a 115 kV/115 kV double circuit, following County Road 86 to the southeast along the north side of County Road 86 for approximately 0.73 mile, where it turns northeast. The double circuit line runs cross country for approximately 575 feet, where it turns north-northeast and runs for approximately 540 feet until it turns east, entering the proposed Colvill Substation (approximately 180 feet).

The southern single circuit 115 kV segment taps off of the existing CFT to Empire 115 kV transmission line where the line intersects Rochester Road/County Road 86, east of TH 52. The

line will continue southeast along the south side of County Road 86 for approximately 0.3 mile, where it crosses to the north side of County Road 86 and joins the northern single circuit tap segment, continuing as a double circuit segment, as described above.

1.3 Project Purpose

The proposed facility improvements are required to support the interconnection of a new generation facility proposed by Invenergy Cannon Falls LLC, the Cannon Falls Generation Station. Xcel Energy is also expanding the existing Cannon Falls Transmission Substation to accommodate the facilities.

1.4 Sources of Information

Much of the information contained within this document was provided by the applicant or the applicant's representatives in the form of the Application for a HVTL Route Permit and correspondence.

Additional sources of information are listed below:

- Minnesota Pollution Control Agency (http://www.pca.state.mn.us/)
- Minnesota Department of Natural Resources (http://www.dnr.state.mn.us/index.html)
- Minnesota Department of Health (http://www.health.state.mn.us/)
- U. S. Environmental Protection Agency (http://www.epa.gov/)
- Electric Power Research Institute (http://www.epri.com/default.asp)
- City of Shakopee (http://www.ci.shakopee.mn.us/)
- U. S. Department of Agriculture Natural Resources Conservation (http://soils.usda.gov/about/)
- Minnesota Geological Survey (http://www.geo.umn.edu/mgs/)
- Department of Administration, State Demographic Center (http://www.demography.state.mn.us/)
- Federal Emergency Management Agency (http://www.fema.gov/)
- U. S. Department of Energy, Energy Information Administration (http://eia.doe.gov/)

2.0 REGULATORY PROCESS AND REQUIREMENTS

Xcel Energy filed the high voltage transmission line (HVTL) route permit application on April 25, 2006. The application for the HVTL Route Permit was accepted by the PUC on May 4, 2006.

The proposed 115 kV transmission line does not qualify as a "large energy facility" because it is less than 10 miles long (Minn. Stat. 216B.2421, subd. 2(3)). Therefore, no CON is required for the proposed project.

In accordance with the Power Plant Siting Act a route permit is required before a HVTL can be constructed. The power plant siting act requirement became law in 1973 in Minnesota Statutes, 116C.51 through 116C.69. The rules to implement the permitting requirement for a HVTL are in Minnesota Rules Chapter 4400. A HVTL is defined as a conductor of electric energy and associated facilities designed for and capable of operating at a nominal voltage of 100 kilovolts or more either immediately or without significant modification.

The application is being reviewed under the Alternative Review Process (Minnesota Rules 4400.2010) of the Power Plant Siting Act (Minnesota Statutes 116C.51 to 116C.69). Under the Alternative Review Process, an applicant is not required to propose any alternative sites or routes. The Department of Commerce (DOC) Energy Facility Permitting staff prepares a document called an Environmental Assessment, and a public hearing is required but it need not be a contested case hearing. The PUC has six months to reach a decision under the Alternative Process from the time the application is accepted. Copies of the application, along with other pertinent documents can be obtained through the DOC Project Manager and maybe viewed at PUC web site (http://energyfacilities.puc.state.mn.us/Docket.html?Id=18548).

In accordance with the rules applicable to this matter, the Department of Commerce Energy Facility Permitting (EFP) staff held a public information/EA scoping meeting in Cannon Falls on June 5, 2006. This meeting provided the public with an opportunity to learn about the proposed project, to suggest other route alternatives, and to identify concerns that should be considered by the DOC EPF staff in preparing an EA. Public comments on the scope of the EA were accepted through June 12, 2006.

The major areas of concern voiced during the public meeting were the implications of MnDOT's Vision 52 (i.e., Highway 52 and County Road 86 interchange) on potential HVTL route and the specific alignment options for the transmission line along given properties. These issues, along with the typical HVTL routing impacts, were incorporated into the proposed Order on the Environmental Assessment Scoping Decision.

The Commissioner of the DOC issued a Scoping Order on June 14, 2006 (**Appendix A**).

3.0 IMPLICATIONS OF MNDOT VISION 52

At the public hearing held on June 5, 2006 for this project, a landowner provided information regarding plans (i.e., Vision 52-Cannon Falls Subarea) the Minnesota Department of Transportation (MNDOT) had been providing to local landowners. The landowner expressed a preference for Xcel Energy to follow an alignment that would match up with one of the proposed County Road 86/Highway 52 interchange alternatives (i.e., Alternative A2) and avoid placing the proposed transmission line in front of the home she owned.

Xcel Energy has reviewed the various options that MNDOT has provided regarding this project to add an interchange on Highway 52 to connect to CR 86. The following information was included in an evaluation of the impact Vision 52 may have on route the HVTL:

1. Communications between Department of Commerce Staff and the Department of Transportation indicated that the DOT Metro Division sees the need for an interchange at TH 52 and CR 86. However, that need is not immediate. There have been some interchange concepts developed, and one design concept is "preferred." (**Appendix B**).

2. No formal approvals, reviews or budgeting have occurred for the MNDOT project. Therefore it is difficult for Xcel Energy to design a route that would assure there would be no conflicts with the potential future interchange.

3. Xcel Energy has made some general assumptions to attempt to address the landowners concerns and to avoid any major conflicts with this proposal in the future.

4. A major issue that creates limitations to Xcel Energy's options is the requirement that the total length of double circuit 115 kV construction needs to be 1 mile or less. This has limited Xcel Energy's options for consideration since the proposed route has almost 1 mile of double circuit construction.

5. The landowner has expressed a desire to keep the line further away from the home located on her property. The two alternatives assessed move the line further north of the home, but do need to go across agricultural property.

Assessment of Options

Figures 8 and 9 provide a summary of two additional options Xcel Energy has assessed in an effort to mitigate landowner concerns. **Table 4** is a spreading illustrating the difference between these two alternatives and the proposed route.

None of the proposed route options have additional double circuit construction due to the restriction on the amount of double circuit construction that can be used for this project based on planning requirements.

Alternative 1

Xcel Energy would tap the existing Cannon Falls Transmission line (130 feet) north of their original proposed route and follow a route that would place the new single circuit 115 kV line just north of the grove of trees. Where the line meets CR 85, it would follow along the west side of the road. The North tap line would follow along the east side of CR 85 for its entire length.

- Cost increase from proposed route: $121,000
- Change in impacts: The impacts to agricultural lands are increased, but less clearing will be required and the line will be further away from residences on CR 86.

Alternative 2

Xcel Energy would tap the existing Cannon Falls Transmission line (590 feet) north of their original proposed route and follow the property line to CR 85. Where the line meets CR 85, it would follow along the west side of the road. The North tap line would follow along the east side of CR 85 for its entire length.

- Cost increase from proposed route: $137,000
- Change in impacts: The impacts to agricultural lands are increased, but less clearing will be required and the line will be further away from residences on CR 86.

4.0 ASSESSMENT OF IMPACTS AND MITIGATIVE MEASURES

The proposed route and substation are located just northwest of the city of Cannon Falls in Douglas, Hampton and Randolph townships in Dakota County and Cannon Falls Township in Goodhue County. The area between the CFT to Empire transmission line and the proposed Colvill Substation is primarily agricultural. The area to the south and east is developing. Several commercial and residential developments are being constructed or planned along Harry Avenue, south of the proposed tap.

4.1 Socioeconomic

Socioeconomics refers to the economic, social, and demographic characteristics of a region. The existing socioeconomic characteristics of Dakota and Goodhue counties, the State of Minnesota and the Twin Cities metropolitan area were reviewed by the DOC/EFP staff.

Goodhue County comprises a land area of 764 square miles in the southeast portion of Minnesota, approximately 50 miles south of the cities of Minneapolis and St. Paul.

Goodhue County is basically rural; its largest city is Red Wing with a population of 16,116. The northeastern area of the county is characterized by rolling hills and small woods, with sparsely located farms. The main crops include corn, soybeans, and wheat. In addition to Cannon Falls and Red Wing, there are eight small cities and 21 townships.

The 2000 census reports Dakota County's population at 355,904, Goodhue County's population at 44,127 and the city of Cannon Falls with a population of 3,557. The region experienced a positive net migration. The Twin Cities metropolitan area contains over half the State's total population.[1] Dakota County is 90 percent Caucasian, and Goodhue County is 96 percent Caucasian. Of the townships within the Project area, the population ranges from 98 to over 99 percent Caucasian. Minority groups in the area constitute a very small percentage of the total population.

Per capita incomes within the townships in the Project area are similar to those found through Dakota and Goodhue Counties. The percentages of the population within the townships in the Project area are comparable to the levels found in Dakota and Goodhue counties. The Project area does not contain disproportionately high minority populations or low-income populations. No impacts are anticipated to minority or low-income populations.

Table 5 presents the recent population figures for Dakota County, Goodhue County and the State of Minnesota.

Approximately 4 to 6 workers will be required by Xcel Energy for transmission line construction and 8 to 10 workers will be needed, on average, for the substation construction. The transmission crews are expected to spend approximately 13 weeks constructing the transmission

[1] Minnesota Planning Agency, State Demographic Center (http://www.mnplan.state.mn.us/demography/index.html)

line. During construction, there will be a small positive impact on the community due to the expenditures of the construction crews in the local community.

4.2 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 the pressure waves into perceivable sound. Noise is measured in decibels (dB).

Noise standards have been established by the MPCA, Minnesota Rules part 7030.0040, subp. 2. The MPCA is the regulatory agency responsible for the enforcement of these standards. The standards are consistent with speech (hearing and conversation), annoyance, and sleep requirements for receivers within areas classified according to land use activities.

The MPCA has established various noise area classifications (NAC) and has established noise standards for each classification. The NAC area classification is based on the land use activity at the location of the receiver, and the NAC determines the applicable noise standard. Lower noise levels are required in residential areas, for example, than in industrial zones.

The four noise area classifications are: NAC-1, NAC-2, NAC-3, and NAC-4. Some of the land use activities under NAC-1 include household units, hospitals, religious services, correctional institutions, and entertainment assemblies. NAC-2 land use activities include mass transit terminals, retail trade, and automobile parking. Some NAC-3 land uses include manufacturing facilities, utilities, and highway and street ROW. NAC-4, which has no noise limits, consists of undeveloped and under construction land use areas.[2]

Table 6 sets forth the Minnesota Noise Standards for the appropriate land use.

Distance is a main criterion for measuring the strength of noise. For every doubling of distance from the noise source, a decrease of 6dB occurs from isolated sources.

There is one residence located within 200 feet of the proposed southern single circuit 115 kV transmission line route and three residences within 300 feet of the double circuit 115kV/115kV transmission line route. All the residences fall within NAC 1. The audible noise generated from the transmission lines is not expected to exceed the background noise levels nor the noise standards established for NAC 1.

Noise will be generated by the construction of the HVTL; the construction noise will be predominantly intermittent sources originating from diesel engine driven construction equipment. Potential noise impacts will be mitigated by proper muffling equipment fitted to construction equipment and restricting activities conducted during nighttime hours.

Corona Noise

[2] http://www.pca.state.mn.us/programs/noise.html

Corona can be defined as a type of localized discharge that results from high, non-uniform electric fields. At high voltages, corona produces visible light, and audible noise. The level of noise or its loudness depends on conductor conditions, voltage level, and weather conditions. Generally, noise levels during operation and maintenance of transmission lines is minimal.[3]

Noise emission from a transmission line occurs during heavy rain and wet conductor conditions. In foggy, damp, or rainy weather conditions, power lines can create a subtle crackling sound due to the small amount of the electricity ionizing the moist air near the wires. During heavy rain the general background noise level, rain falling and wind blowing, is usually greater than the noise from the transmission line.

In these conditions, very few people are out near the transmission line. For these reasons audible noise is not noticeable during heavy rain. During light rain, dense fog, snow, and other times when there is moisture in the air, the proposed transmission lines will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is a barely perceptible, sporadic crackling sound.

Mitigative Measures

No mitigative measures are necessary since there will be nominal corona or noise impacts from the project.

4.3 Aesthetics

The transmission line poles will be in contrast to the primarily agricultural land along the proposed route. However, the area is developing and includes a mixture of residential, commercial, and industrial land uses. There are existing transmission lines within 0.5 mile of all the residences and businesses along the proposed route, and the majority of the route follows existing roadway corridors. The proposed Substation site is located adjacent to an area that has existing industrial and commercial buildings.

Mitigative Measures

Mitigative measures are not necessary since the visual impact of the transmission lines is not significant.

4.4 Recreation

Recreational opportunities near the Project area include the Richard J. Dorer Memorial Hardwood State Forest, Cannon Country Club Golf Course, Lake Byllesby County Park, the Cannon River (a state wild and scenic river), Cannon Valley Trail, and several local city of Cannon Falls parks (Explore Minnesota, 2006; MN DNR, 2006). The proposed HVTLs will not directly impact these resources and it is not anticipated that the transmission line will be visible from these resources.

[3] http://www.clarkson.edu/~mcgrath/web.html

Mitigative Measures

No mitigation is necessary.

4.5 Transportation

Traffic near the proposed facility will increase during construction. Local motorists may be temporarily inconvenienced by the increase in large construction vehicles on the roadways and possible delays in traffic. This impact is expected to last during the construction period of 12 months. Traffic due to the construction workers could be expected to produce local impacts over a 30-minute period at the beginning and end of the day and each time a change in shift occurs.

Mitigative Measures

Because traffic levels may only be slightly, but insignificantly, impacted during construction with no impacts anticipated during facility operation, no mitigation will be required. The operation of the transmission line will have no impact on traffic patterns or usage.

4.6 Land Use

Commercial, Industrial and Residential

The southern single circuit transmission tap line crosses areas identified in the Cannon Falls Land Use Plan as low density residential land use, southwest of County Road 86. The northern single circuit transmission tap line and the double circuit transmission line cross areas identified in the Land Use plan as industrial land use and future industrial land use (city of Cannon Falls, MN, 2003). There are scattered residences and businesses along County Road 86.

The Colvill Substation is in an area that is identified in the Land Use plan as industrial land use (City of Cannon Falls, MN, 2003). The proposed substation site is located within an area currently being used for industrial activities. Additionally, the substation will be located within the proposed CFEC generation site. The proposed HVTLs should not affect the existing or planned land uses in the area.

Mitigative Measures

No mitigative measures are proposed since no impacts are anticipated.

Agriculture

According to the 2002 Census of Agriculture, there are 235,763 acres of land in farms in Dakota County, and 384,108 acres of land in farms in Goodhue County. The 2002 market value of production was $112 million in Dakota County, and $157.01 million in Goodhue County. Primary crops in the area are corn and soybean (USDA, 2002). The Project area is planted in corn and soybeans.

Approximately 1,500 ft^2 (0.03 acre) of agricultural land will be permanently impacted by the proposed project. Permanent impacts will occur due to the placement of the transmission line poles and construction of the substation. Temporary impacts may include soil compaction and crop damages within the ROW. Temporary impacts are estimated at 2.6 acres.

Mitigative Measures

Landowners will be compensated for the use of their land through easement payments. Additionally, to minimize loss of farmland and to ensure reasonable access to the land near the poles, Xcel Energy intends to place the poles approximately 5 feet from the roadway ROW. When possible, Xcel Energy will attempt to construct the transmission line before crops are planted or following harvest. Xcel Energy will compensate landowners for crop damage and soil compaction that occurs as a result of the project. Soil compaction will be addressed by compensating the farmer to repair the ground or by using contractors to chisel-plow the site. Normally, a declining scale of payments is set up over a period of a few years.

Forestry

The nearest forested area where red and white oak, maple, and white pine trees are harvested is the Richard J. Doring Memorial Hardwood State Forest, approximately 2 miles east of the project area (Breining, 2000). The proposed project will not affect this forestry-based economy.

Mitigative Measures

No mitigative measures will be required.

Mining

There is a commercial aggregate operation in the northwest corner of Section 7 of Cannon Falls Township, north of the railroad line and southwest of Rochester Road (MNDOT, 2001). The proposed transmission line will not impact active mining operations.

Mitigative Measures

No mitigative measures are necessary because the project will not impact any mining operations.

Prohibitive Sites

The project locations do not contain prohibitive sites, including:
- National Parks;
- National historic sites and landmarks;
- National historic districts;
- National wildlife refuges;
- National monuments;
- National wild, scenic, and recreational river ways;

- State wild, scenic, and recreational rivers and their land use districts;
- State parks;
- Nature conservancy preserves;
- State Scientific and Natural Areas; and,
- State and national wilderness areas.

4.7 Topography, Soils and Geology

Two primary types of glacial features characterize this landscape. Steep, short slopes of the large St. Croix Moraine in the north are rolling to hummocky, and strewn with lakes, while outwash areas further south are level to rolling. Limestone, sandstone, and shale bedrock lie beneath drift and are often exposed along highly eroded stream valleys in the east.

Glacial drift is generally less than 100 feet thick within the St. Croix Moraine and outwash plains subsection, with maximum drift thickness of about 200 feet. Ordovician and Devonian dolomite (some limestone, sandstone, and shale) is locally exposed, especially in the dissected stream valleys at the eastern edge of the subsection. Precambrian bedrock is exposed along and under the St. Croix River.[4]

Soils in the St. Croix Moraine & outwash plains subsection are primarily Alfisols (soils formed under forested vegetation). Areas of Mollisols (soils formed under prairie vegetation) can be found on the outwash plains. Parent materials are mixed on the moraines (mixtures of clay loams, loams, sandy loams, and loamy sands). The outwash plains have sandy parent materials. Local well boring logs (County Well Index data base) indicate that the depth to the uppermost bedrock formation in the vicinity of the proposed site is located near the surface, ranging from 10 feet below grade to 58 feet below grade[5]. The top bedrock layer consists of the Prairie du Chien Group and the St. Peter Sandstone. The Prairie du Chien consists of dolostone formations with a few thin sandstone beds and sandstone at the base of the formation. The Prairie du Chien has a thickness of approximately 260 feet. The St. Peter Sandstone consists of medium to fine-grained massive well-sorted quartz sandstone. A thin clay layer at the base retards vertical water movement.

Mitigative Measures

Construction will result in no disturbances to the bedrock geology beneath the site. Soils exposed during construction may be vulnerable to erosion until stabilized. Some compaction of surface soils will result from the use of heavy construction equipment.

Xcel Energy has stated that BMP will be implemented during construction activities to reduce and minimize soil erosion and compaction.

[4] Minnesota Geological Survey Goodhue County Atlas C-12, Parts A & B. 1998
[5] http://www.health.state.mn.us/divs/eh/cwi/

4.8 Flora and Fauna

Impacts to trees may occur where the southern single circuit transmission line parallels County Road 86. The area of trees that will be impacted by the proposed project due to the routing of these transmission lines is expected to be approximately 0.5 acre (20,000 ft2). A width of 40 feet will be cleared for the 115 kV transmission line ROW along this portion of the route.

A majority of the rest of the Project is agricultural land along the transmission line and industrial park land for the Covill substation site. Row crops such as corn and soybean dominate the area.

There is a potential for temporary displacement of wildlife during construction and the loss of small amounts of habitat from the project site. Wildlife that inhabit trees that will be removed for the project and organisms that inhabit agricultural areas will likely be displaced. Comparable habitat is adjacent to the route for both habitat types, and it is likely that these organisms would only be displaced a short distance.

Additionally, the electrocution of large birds, such as raptors, can be a concern with distribution lines. Electrocution occurs when birds with large wingspans come in contact with two conductors or a conductor and a grounding device.

Xcel Energy transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution, so there are no concerns about avian electrocution as a result of the proposed project.

Mitigative Measures

To minimize impacts to trees in the Project corridor, Xcel Energy will only remove trees located in the right-of-way for the transmission lines, or that would impact the safe operation of the facility.

Displacement of fauna is anticipated to be temporary in nature. No long term population-level effects are anticipated; therefore, no mitigation is proposed.

Xcel Energy has been working with various state and federal agencies over the past 20 years to address these issues. In 2002, Xcel Energy, Inc.'s operating companies including Xcel Energy, entered into a voluntary memorandum of understanding (MOU) to work together to address avian issues throughout its territory. This includes the development of avian protection plans (APP) for each state Xcel Energy, Inc. serves. Currently, Xcel Energy, Inc. is finalizing the APP for Colorado and will begin work on other states. Standard reporting methods were also developed.

The primary methods Xcel Energy uses to address avian issues for transmission projects include:

- Working with the MDNR to identify any areas that may require marking transmission line shield wires and/or using alternate structures to reduce collisions,

- Attempting to avoid areas known as major flyways or migratory resting spots

4.9 Rare & Unique Natural Resources

The proposed site is located primarily on what was historically native prairie land and Maple-Basswood forest. As a consequence the area provides a suitable habitat for some species listed by the MDNR as threatened or endangered.

The MDNR (Minnesota Natural Heritage and Nongame Research Program) maintains a list of plants and animals considered rare in the state. MDNR searched the Minnesota Natural Heritage database for known occurrences of rare species and natural communities within a one-mile radius of the proposed site (**Appendix C**). Although MDNR found twelve such occurrences, none are is located on the proposed site and none is likely to be adversely affected by the CFEC activities.

One scientific and natural area (i.e., the River Terrace Prairie SNA) is located four miles east of the proposed site. This gravel prairie community was formed of glacial outwash atop an isolated Cannon River terrace, now 30 feet above the surrounding lower terraces. Even from a mile away, this prairie is a striking feature on the landscape. Gravel prairie communities are rare in the state, and this is the only example in Goodhue County. One of the largest known populations of the rare kittentail occurs here, along with other native prairie forbs and grasses.

The resources in **Table 7** were compiled using the MDNR Natural Heritage Database (NHNRP Contact #: ERDB 20060689).

Mitigative Measures

It is not anticipated that mitigative measures will be necessary. Sarah Hoffman, on behalf of the DNR, stated that, based on review, the species potentially impacted by the project include the dry sand-gravel prairie native plant community and Kitten-Tails. These areas will be avoided.

4.10 Archaeological and Historic Features

In February 2006, a review of records at the Minnesota State Historical Preservation Office (SHPO) indicated seven previously recorded cultural resources within 1 mile of the proposed corridor (**Table 9**). None of these site forms includes a bibliographic reference so the surveys and reports that identified these sites are currently unknown.

According to the site forms, three sites in Dakota County (21DK0032, 21DK0033 and 21DK0071) and two sites in Goodhue County (21GD0175 and 21GD0179) were recorded during a survey by the Institute for Minnesota Archaeology in 1987 near the Lake Byllesby Reservoir. This report was not located in the SHPO during the background review. The remaining two sites in Goodhue County (21GD0140 and 21GD0141) were recorded during the Minnesota Historical Society statewide survey in 1979 (Minnesota Historical Society, 1981). Three additional cultural

resource surveys were previously documented within 1 mile of the proposed Project area (Harrison 2003, Skaar 1997, Sluss 1994). These survey reports identified no cultural resources.

The seven previously recorded pre-contact sites consist of lithic scatters; the eligibility of these sites for listing on the National Register of Historic Places (NRHP) has not been determined.

In addition, there are 12 architectural properties listed within 1 mile of the proposed route (**Table 8**). The properties include a dam, barns, a farmstead, feed company buildings, grain and malting company buildings, a railroad boxcar, and a mill. These properties were recorded during a 1978 survey (MNSHPO 2006). None of these inventoried properties has been evaluated for eligibility for listing in the NRHP.

Impacts to previously identified resources are not anticipated as a result of the proposed project. In the event that an impact would occur, Xcel Energy would determine the nature of the impact and consult with the SHPO on whether or not the resource was eligible for listing in the NRHP.

Cultural Values

Cultural values include those perceived community beliefs or attitudes that provide a framework for unity in a given community. The communities near the project corridor, including the City of Cannon Falls, appear to value pioneer roots and the local history.

The economy of these areas depends on agricultural practices (typically corn, soybeans, grains, and grazing), manufacturing, and tourism. Tourist attractions are centered primarily around the Cannon River. Additionally, throughout the year, the City of Cannon Falls proudly hosts many community events and activities. Many of these activities are within the Cannon Falls city limits and will not be impacted by the project.

Museums and visitor centers are also found within Cannon Falls and the surrounding area. These museums highlight the history of the area, which include information on the area's Swedish-American roots and Cannon Falls' history.

Mitigative Measures

Mitigation for project-related impacts on NRHP-eligible archaeological resources may include an effort to minimize impacts on the resource and/or additional documentation through data recovery.

If human remains should be inadvertently encountered during the excavation and construction, such a discovery would be handled in a manner compliant with Minnesota's Private Cemeteries Act (Chapter 307.08).

No impacts are anticipated to Cultural Values.

4.11 Air Quality

The only potential air emissions from a 115 kV transmission line result from corona and are limited. Corona consists of the breakdown or ionization of air in a few centimeters or less immediately surrounding conductors, and can produce ozone and oxides of nitrogen in the air surrounding the conductor. For a 115 kV transmission line, the conductor gradient surface is usually below the air breakdown level. Typically, some imperfection such as a scratch on the conductor or a water droplet is necessary to cause corona. Ozone is not only produced by corona, but also forms naturally in the lower atmosphere from lightning discharges and from reactions between solar ultraviolet radiation and air pollutants such as hydrocarbons from auto emissions. The natural production rate of ozone is directly proportional to temperature and sunlight and inversely proportional to humidity. Thus, humidity (or moisture), the same factor that increases corona discharges from transmission lines, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere. Because of its reactivity, it is relatively short-lived. The project area presently meets all federal air quality standards.

Currently, both state and federal governments have regulations regarding permissible concentrations of ozone and oxides of nitrogen. The national standard is 0.08 ppm on an 8-hour averaging period. The state standard is 0.08 ppm based upon the fourth-highest 8-hour daily maximum average in one year.

During construction there will be emissions from vehicles and other construction equipment and fugitive dust from ROW excavation and clearing activities. Temporary air quality impacts caused by the proposed construction-related emissions are expected to occur during this phase of activity.

Mitigative Measures

There will be no significant adverse air quality impacts to the surrounding environment because of the short and intermittent nature of the emission and dust-producing construction phases. No mitigation measures are necessary for the construction of the transmission lines.

4.12 Water Resources (surface water/wetlands)

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading, and construction traffic. Once the project is complete it will have no impact on surface water quality.

The surface water resources that could be affected by the construction of the project include a small (0.18 acre) palustrine scrub shrub (PSS1C) NWI wetland located 800 feet north of the proposed substation, and an intermittent stream (a tributary to Goodhue County Ditch No. 1), which is approximately 0.4 mile from the northeast corner of the substation (USFWS, 1990; USGS, 2004). The Cannon River is approximately 0.9 mile from the proposed project and Pine Creek (a trout stream) is approximately 0.5 mile from the proposed project. Construction of the

substation and associated access roads will not directly affect the surface water resources. The nearest construction feature is approximately 800 feet away from the wetland, and the other surface water resources are outside of the construction area. The project is not within a mapped 100-year floodplain (FEMA, 1981). No direct impacts to the surface water resources are anticipated.

No permanent impacts to water bodies or wetlands are anticipated.

Mitigative Measures

Standard erosion control measures and best management practices (BMP) will be utilized to minimize potential impacts.[6] An NPDES permit and SWPPP will be prepared for the project.

No additional mitigation is necessary.

4.13 Human Health and Safety

The proposed transmission line will be designed to meet or exceed the National Electric Safety Code.[7] Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed after installation. The proposed transmission line would be equipped with protective devices to safeguard the public from the transmission line if an accident occurs and a structure or conductor falls to the ground. The protective equipment would de-energize the line when an event occurred. In addition, the substation facilities will be fenced, and access will be limited to authorized personnel.

Electric and Magnetic Fields

The HVTL will be constructed to comply with Rural Utilities Service (RUS) as well as the National Electric Safety Code (NESC).[8] These standards are designed to minimize human health risks from electric and magnetic fields to nationally acceptable standards.

Electric and magnetic fields (EMF) arise from the flow of electricity and the voltage of a line. 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 current flow through the conductors. There is no state or federal standard for transmission line electric fields. However, in previous cases, the Minnesota Environmental Quality Board (EQB) has imposed, in its transmission line permits, a maximum electric field limit of 8 kV/meter measured one meter above the ground.

The restriction was designed to prevent serious hazard from shocks when touching large objects like a bus or combine parked under high voltage transmission lines, usually 345 kV or greater. The electric field of this project will not exceed 8 kV/meter. Many years of research on the biological effects of electric fields have been conducted on animals and humans. No association

[6] http://www.pca.state.mn.us/publications/wq-strm2-05.pdf
[7] http://www.ieee.org/portal/index.jsp
[8] http://www.usda.gov/rus/electric/

has been found between exposure to electric fields and human disease. The possible effect of EMF exposure on human health has been a matter of public concern over the past few years. While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields can cause biological responses or even health effects continues to be the subject of research and debate.

The most current and exhaustive reviews of the health effects from power-frequency fields conclude the evidence of health risk is weak and do not support the allegation of a major public-health danger. The National Institute of Environmental Health Sciences (NIEHS) issued its final report on June 15, 1999, following six years of intensive research. It concluded that the scientific evidence that extra low frequency EMF exposures pose any health risk is weak. The NIEHS was the lead government agency in directing and carrying out a congressionally mandated research program on EMF.

The Minnesota Department of Health (MDH) issued "An Assessment of Health Effects Research on Electric and Magnetic Fields" in January of 2000. The MDH concluded the following:

> *"…the current body of evidence does not show that exposure to these fields is a health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer or any other adverse human health effect.*
>
> *The current body of research lacks fundamental evidence to support a cause and effect relationship between magnetic fields and childhood leukemia. This conclusion is based on laboratory studies, which have failed to demonstrate adverse health effects or a plausible biological mechanism of causation (in vivo and in vitro).*
>
> *As with many other environmental health issues, the possibility of a health risk from EMF cannot be entirely dismissed. The MDH considers it prudent public health policy to continue to monitor the EMF research and to support prudent avoidance measures, such as providing information to the public regarding EMF sources and exposure."*

Electric utilities monitor and review research on the EMF issue and where possible, incorporate these conclusions in its planning and operation of power lines and substations.

There are currently no Minnesota regulations pertaining to magnetic field exposure. Electric utilities provide information to the public, interested customers and employees so they can make informed decisions about EMF. This includes measurements for customers and employees who request them.

Past decisions have reflected that the scientific data does not show any significant risk of health effects due to exposure to magnetic fields. Policy decisions have continued to support the construction of electric infrastructure, taking into consideration the most recent information available on the issue.

The proposed 115 kV/115 kV transmission line will have a maximum electric field density of approximately 0.74 kV per meter, at centerline, one meter above ground and is based on unlike phasing (i.e., opposing phasing) of A-B-C and C-B-A ground to top. The proposed 115 kV single circuit transmission line will have a maximum electric field density of approximately 1.05 kV per meter, at centerline, one meter above ground. This is significantly less than the maximum limit of 8 kV per meter that has been a permit condition imposed by the EQB in other HVTL applications. The EQB standard was designed to prevent serious hazard from shocks when touching large objects, such as tractors, parked under extra high voltage transmission lines of 500 kV or greater.

Table 10 provides the electric fields at maximum conductor voltage for the proposed 115 kV transmission line. Maximum conductor voltage is defined as the nominal voltage plus five percent.

Table 11 provides the existing and estimated magnetic fields based on the proposed line and structure design. The expected magnetic field for the proposed structure type and phase current has been calculated at various distances from the center of the pole in milligauss.

Stray Voltage

Stray voltage is defined as a natural phenomenon that can be found at low levels between two contact points in any animal confinement area where electricity is grounded. Electrical systems, including farm systems and utility distribution systems, must be grounded to the earth by code to ensure continuous safety and reliability. Inevitably, some current flows through the earth at each point where the electrical system is grounded and a small voltage develops. This voltage is called neutral-to-earth voltage (NEV). When a portion of this NEV is measured between two objects that may be simultaneously contacted by an animal, it is frequently called stray voltage.

Stray voltage is not electrocution, ground currents, EMFs, or earth currents.

Stray voltage has been raised as a concern on some dairy farms because it can impact operations and milk production. Problems are usually related to the distribution and service lines directly serving the farm or the wiring on a farm affecting farm animals that are confined in areas of electrical use. In those instances when transmission lines have been shown to contribute to stray voltage, the electric distribution system directly serving the farm or the wiring on a farm was directly under and parallel to the transmission line. These circumstances are considered in installing transmission lines and can be readily mitigated.

No stray voltage issues are anticipated with this project.

Mitigative Measures

There are no mitigative measures necessary to address human health and safety.

4.14 Radio and TV Interference

Corona on transmission line conductors can generate electromagnetic noise at frequencies at which radio and television signals are transmitted. This noise can cause interference (primarily with AM radio stations and the video portion of TV signals) with the reception of these signals depending on the frequency and strength of the radio and television signal. However, this interference is often due to weak broadcast signals or poor receiving equipment.

If interference occurs because of the power line, the electric utility is required to remedy problems so that reception is restored to its original quality.

Mitigative Measures

No interference issues are anticipated with this project.

5.0 OTHER PERMITS AND APPROVALS REQUIRED

Table 12 contains a list of the anticipated permits and associated environmental approvals required for the CFEC project. Compliance with the terms of all applicable and relevant regulatory permits and approvals will be a condition of any Site Permit issued by the PUC.

6.0 ACRONYMS, ABBREVIATIONS and DEFINITIONS

ADT	average daily traffic
ANSI	American National Standard Institute
BACT	Best Available Control Technology
BMPs	Best Management Practices
Btu/kWhr	British thermal units per kilowatt-hour
CAA	Clean Air Act
CERCLA	Federal Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended
CESQG	Conditionally Exempt Small Quantity Generator
CFR	Code of Federal Regulations
CGTs	Combustion gas turbines
CMP	Crop Management Program
CO	Carbon monoxide
CO_2	Carbon dioxide
CON	Certificate of Need
CT	Combustion Turbine
CY	Cubic yards
dBA	A-weighted decibel
DLN	Dry Low-NO_X
DOC	Department of Commerce
DSM	Demand Side Management
EA	Environmental Assessment
ECS	Ecological Classification System
EIS	Environmental impact statement
EMF	Electromagnetic field
EPA	U.S. Environmental Protection Agency
EQB	Environmental Quality Board
ELCR	Excess Lifetime Cancer Risk
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FEP	Faribault Energy Park
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
GE	General Electric
GHG	Greenhouse gas emissions
GISB	Gas Industry Standards Board
gpd	Gallons per day
HCP	Habitat Conservation Plan
HRSG	Heat Recovery Steam Generator
HVTL	High Voltage Transmission Line
IES	Illuminating Engineering Society
ISTS	Individual Septic Treatment System

kV	Kilovolt
LAER	Lowest Available Emission Rate
LEPGP	Large Electric Power Generating Plant
LOS	Level-of-service
LUG	Local Unit of Government
MW	Megawatts
MDH	Minnesota Department of Health
MDNR	Minnesota Department of Natural Resources
MDOT	Minnesota Department of Transportation
MMPA	Minnesota Municipal Power Agency
MPCA	Minnesota Pollution Control Agency
NAAQS	National Ambient Air Quality Standards
NET	National Emission Trends
NEPA	National Environmental Policy Act
NH3	Ammonia
NTI	National Toxics Inventory
NNG	Northern Natural Gas
NOx	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
OAHP	Office of Archaeology and Historic Preservation
PAH	Polycyclic aromatic hydrocarbons
Pb	Lead
PEMA	Palustrine emergent temporarily flooded
PEMC	Palustrine emergent seasonally flooded
PFOA	Palustrine forested temporarily flooded
PESCP	Permanent Erosion and Sediment Control Plan
PM	Particulate matter
PM_{10}	Particulate matter less than 10 microns in diameter
$PM_{2.5}$	Particulate matter less than 2.5 microns in diameter
POWHX	Palustrine open water permanently flooded excavated
ppb	Parts per billion
ppm	Parts per million
PSD	Prevention of Significant Deterioration
psi	Pounds per square inch
PSS	Potential Site Study
PUC	Public Utility Commission
SARA	Federal Superfund Amendments and Reauthorization Act of 1986, as amended
SCR	Selective catalytic reduction
SDS	State Disposal System
SIL	Significant Impact Levels
SO_2	Sulfur dioxide
SPCC	Spill Prevention Control and Countermeasure
STG	Steam turbine generator
USFWS	U.S. Fish and Wildlife Service
TESCP	Temporary Erosion and Sediment Control Plan

TSP	Total Suspended Particulate Matter
UHC	Unburned Hydrocarbon
USACE	United States Army Corp of Engineers
VOC	Volatile organic compounds

TABLES

FIGURES

APPENDIX A

APPENDIX B

APPENDIX C