# Appleton-Canby

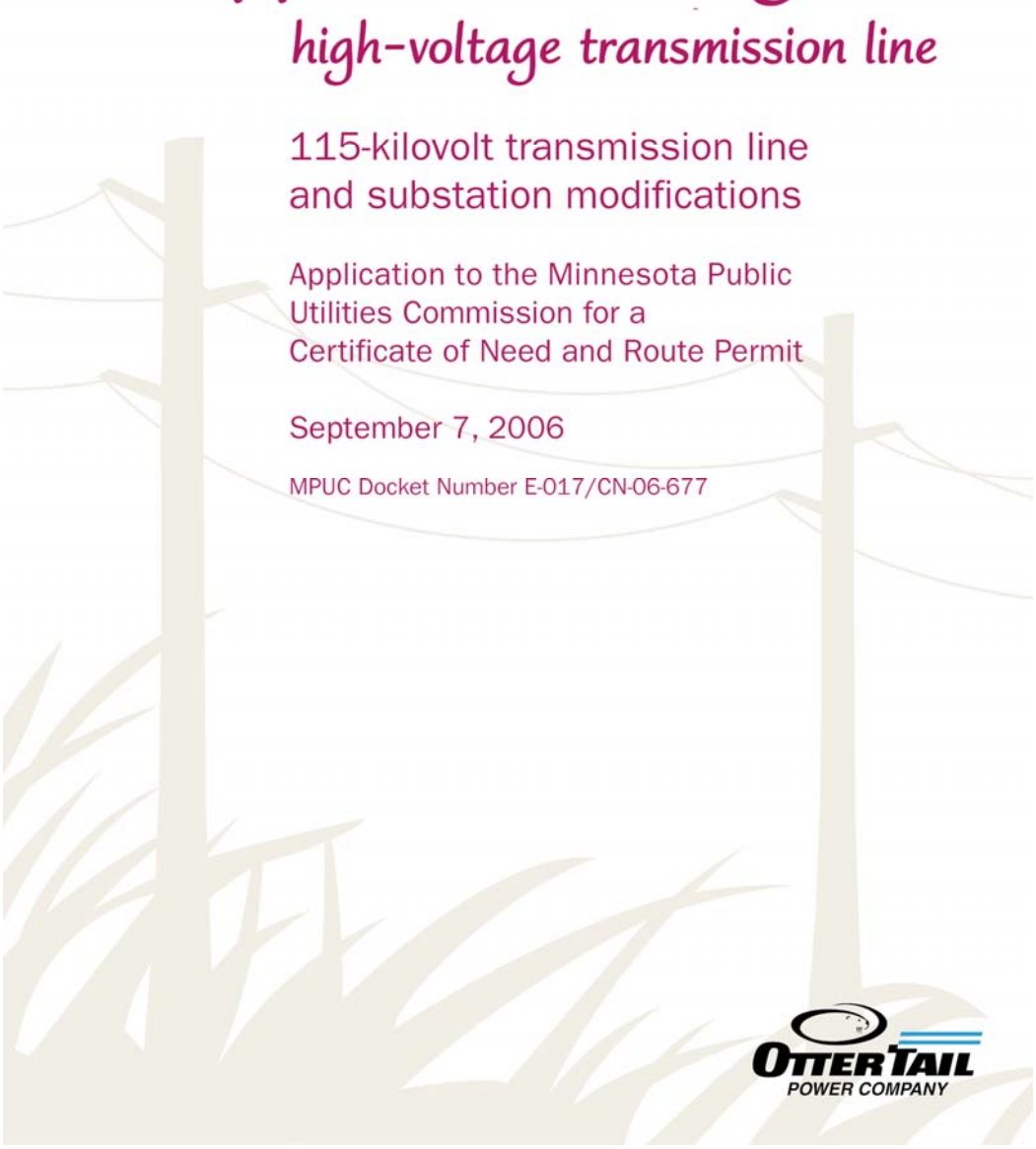
## high-voltage transmission line

115-kilovolt transmission line
and substation modifications

Application to the Minnesota Public
Utilities Commission for a
Certificate of Need and Route Permit

September 7, 2006

MPUC Docket Number E-017/CN-06-677



OTTER TAIL
POWER COMPANY

**APPLICATION FOR**

**CERTIFICATE OF NEED**

**AND**

**ROUTE PERMIT**

**APPLETON – CANBY 115 KILOVOLT REBUILD**

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## COMPLETENESS CHECKLIST

## CERTIFICATE OF NEED APPLICATION

| Authority | Required Information | Section |
|---|---|---|
| 7849.0120 A | Showing that denial would adversely affect adequacy, reliability and efficiency | |
| 1 | Demand forecast for type of energy supplied by proposed facility is accurate | 5.5; Appendix D |
| 2 | Effects of Applicants' conservation program and state and federal conservation programs | 5.7; Appendix E |
| 3 | Effects of Applicants' promotional practices on energy demand | 5.8 |
| 4 | Ability of current facilities and facilities not requiring CON to meet future demand | 5.1; 6.2 |
| 5 | Effect of proposed facility in making efficient use of resources | 4.1; 5.6 |
| | | |
| 7849.0120 B | A more reasonable and prudent alternative has not been demonstrated | |
| 1 | Facility is appropriate size, type and timing compared to reasonable alternatives | 4.1; 6 |
| 2 | Cost of facility and of its energy compared to reasonable alternatives | 4.3; 6 |
| 3 | Effects of the proposed facility upon the natural and socio-economic environment compared to the effects of reasonable alternatives | 6; 9 |
| 4 | Expected reliability of facility compared to reasonable alternatives | 4.1; 6, 8.7 |
| | | |
| 7849.0120 C | Project will provide benefit to society: | |
| 1 | Relationship of facility to overall state energy needs | 5.1 |
| 2 | Effects of facility on natural and socio-economic environment compared to not building facility | 6.5; 9 |
| 3 | Effects of facility inducing future development | 5.1; 8.1.2; 9.2.4; 9.3 |
| 4 | Socially beneficial uses of the output of the facility, including its uses to protect or enhance environmental quality | 5.1; 9 |
| | | |
| 7849.0120 D | Project will comply with relevant policies and regulations of other state and federal agencies and local governments | 2.5; 4.7; 8.4 |
| | | |
| 7849.0210 | Filing fee | Cover Letter |
| | | |
| 7849.0230 | Draft environmental report | Not required |
| | | |
| 7849.0240 | Need Summary and Additional Considerations | |
| | | |

| Authority | Required Information | Section |
|---|---|---|
| 7849.0240, Subp. 1 | Major factors that justify need for facility | |
| | | |
| 7849.0240, Subp. 2A | Socially beneficial uses of facility output, including uses to protect or enhance environmental quality | 5.1; 9 |
| | | |
| 7849.0240, Subp. 2B | Promotional activities that may have given rise to demand | 5.8 |
| | | |
| 7849.0240, Subp. 2C | Effects of the facility in inducing future development | 5.1; 8.1.2, 9.2.4, 9.3 |
| | | |
| 7849.0260 | Proposed LHVTL and alternatives | |
| | | |
| 7849.0260 A | Type and location of proposed line, including: | |
| 1 | Design voltage | 4.1 |
| 2 | Number, sizes and types of conductors | 4.1 |
| 3 | Expected losses under maximum and average loading in lines and terminals or substations | 4.6 |
| 4 | Length of line and portion in Minnesota | 4.1 |
| 5 | Location of DC terminals or AC substations on map | 4.1, Appendix C |
| 6 | List of counties affected by construction and operation | 4.1 |
| | | |
| 7849.0260 B | Availability of alternatives, including: | |
| 1 | New generation of various technologies, sizes, fuel types | 6.3 |
| 2 | Upgrade of existing lines or generating facilities | 6.2.3 |
| 3 | Transmission with different voltages or conductor arrays | 6.2.2 |
| 4 | Transmission lines with different terminals or substations | 6.2.1 |
| 5 | Double circuiting of existing transmission lines | 6.2.4 |
| 6 | If facility for DC (AC) transmission, an AC (DC) transmission line | 6.2.5 |
| 7 | If facility for overhead (underground) transmission, an underground (overhead) transmission line | 6.2.6 |
| 8 | Any reasonable combination of alternatives (1) – (7) | 6 |
| | | |
| 7849.0260 C | For facility and for each alternative, discuss: | |
| 1 | Total cost in current dollars | 4.3 |
| 2 | Service life | 4.1 |
| 3 | Estimated average annual availability | 4.1 |
| 4 | Estimated annual operating and maintenance costs in current dollars | 4.3; 8.6 |
| 5 | Estimate of its effect on rates system-wide and in Minnesota | 4.4 |
| 6 | Efficiency | 4.6; 5.6 |
| 7 | Major assumptions made in sub items (1) – (6) | See above |

| Authority | Required Information | Section |
|---|---|---|
| | | |
| 7849.0260 D | Scaled map showing the system or load center to be served | 3.4; 5.3 |
| | | |
| 7849.0260 E | Any other relevant information about the proposed facility and each alternative | Seriatim |
| | | |
| 7849.0270 | Peak Demand and Annual Consumption Forecast | |
| | | |
| 7849.0270, Subp. 1 | Pertinent data concerning peak demand and annual electrical consumption | 5.4, Appendix D |
| | | |
| 7849.0270, Subp. 2 | Forecast data | 5.5 |
| | | |
| 7849.0270, Subp. 3 | Detail of the forecast methodology employed in Subp.2 | 5.5.1; Appendix D |
| | | |
| 7849.0270, Subp. 4 | Discussion of the database used in current forecasting | 5.5; Appendix D |
| | | |
| 7849.0270, Subp. 5 | Discussion of each assumption made in forecast preparation | 5.5; Appendix D |
| | | |
| 7849.0270, Subp. 6 | Coordination of forecasts | 5.5; Appendix D |
| | | |
| 7849.0280 | Description of ability of existing system to meet forecast demand | 5.5, Appendix D |
| | | |
| 7849.0290 | Conservation programs | 5.7; Appendix E |
| | | |
| 7849.0300 | Consequences of indefinite delay 1, 2, or 3 year postponement | 5.9 |
| | | |
| 7849.0310 | Environmental information | 9 |
| | | |
| 7849.0330 | Provide data for each alternative that would require LHVTL construction | 6.2, 7.2 |
| | | |
| 7849.0340 | Alternative of no facility | 6.5 |
| | | |
| 7849.0340 C | Description of possible methods of reducing environmental impact | 9 |
| | | |

**ROUTE PERMIT APPLICATION**

**ALTERNATIVE PROCESS (115 AND 161 KV LINES)**

**COMPLETENESS CHECKLIST**

| Authority | Required Information | Section |
|---|---|---|
| Minn. R. 4400.2000, Subp. 1(C) | Subpart 1. **Eligible Projects**. An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 4400.2000 to 4400.2950 instead of the full permitting procedures in parts 4400.1025 to 4400.1900: **high voltage transmission lines of between 100 and 200 kilovolts** | Appendix B |
| Minn. R. 4400.2000, Subp. 2. | Subpart 2. **Notice to EQB**. An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 4400.2000 to 4400.2750, shall notify the EQB of such intent, in writing, at least ten days before submitting an application for the project | Appendix B |
| Minn. R. 4400.2100 | **Contents of Application** (alternative permitting process)<br>The applicant shall include in the application the same information required in part 4400.1150, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicant has rejected alternative sites or routes, the applicant shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them | |
| 4400.1150, subp. 2 (applicable per Minn. R. 4400.2100) | **Route Permit for HVTL**<br>A. a statement of proposed ownership of the facility at the time of filing the application and after commercial operation | 3.1 |
| | B. the precise name of any person or organization to be initially named as permittee or permittees and the name of any other person to whom the permit may be transferred if transfer of the permit is contemplated | 3.1 |
| | C. rejected alternative routes and the reasons for rejecting | 7.2 |
| | D. a description of the proposed high voltage transmission line and all associated facilities including the size and type of the high voltage transmission line | 4.1; 4.2 |

**Comment [H1]:** We change this based on what exception the project falls under. I believe this is true for Appleton/Canby as well

| Authority | Required Information | Section |
|---|---|---|
| | E. the environmental information required under 4400.1150, Subp. 3 | 9 |
| | F. identification of land uses and environmental conditions along the proposed routes | 9.1; 9.5 |
| | G. the names of each owner whose property is within any of the proposed routes for the high voltage transmission line | Appendix F |
| | H. United States Geological Survey topographical maps or other maps acceptable to the chair showing the entire length of the high voltage transmission line on all proposed routes | Appendix C |
| | I. identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way with the proposed line | 8.2 |
| | J. the engineering and operational design concepts for the proposed high voltage transmission line, including information on the electric and magnetic fields of the transmission line | 4.1; 8.1; 8.8 |
| | K. cost analysis of each route, including the costs of constructing, operating, and maintaining the high voltage transmission line that are dependent on design and route | 4.3 |
| | L. a description of possible design options to accommodate expansion of the high voltage transmission line in the future | 8.1.2 |
| | M. the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line | 8.3; 8.5 |
| | N. a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line | 2.5 |
| | O. a copy of the Certificate of Need or the certified HVTL list containing the proposed high voltage transmission line or documentation that an application for a Certificate of Need has been submitted or is not required | This document |
| Minn. R.4400.1150, subp. 3 | **Environmental Information**<br>A. a description of the environmental setting for each site or route | 9.1 |

| Authority | Required Information | Section |
|---|---|---|
| | B. a description of the effects of construction and operation of the facility on human settlement, including, but not limited to, public health and safety, displacement, noise, aesthetics, socioeconomic impacts, cultural values, recreation, and public services | 9.2 |
| | C. a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining | 9.3 |
| | D. a description of the effects of the facility on archaeological and historic resources | 9.4 |
| | E. a description of the effects of the facility on the natural environment, including effects on air and water quality resources and flora and fauna | 9.5 |
| | F a description of the effects of the facility on rare and unique natural resources | 9.6 |
| | G. identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route | 9 |
| | H. a description of measures that might be implemented to mitigate the potential human and environmental impacts identified in items A to G and the estimated costs of such mitigative measures | 9 |
| Minn. R. 4400.1350, subp. 2 (applicable per Minn. R. 4400.2300) | **Notice of Project**<br>Notification to persons on EQB's general list, to local officials, and to property owners | To be provided |
| Minn. R. 4400.1350, subp 4 | Publication of notice in a legal newspaper of general cirulation in each county in which the route is proposed to be located. | To be arranged |
| Minn. R. 4400.1350. subp. 5 | Confirmation of notice by affidavits of mailing and publication with copies of the notices | Submit when available |
| Minn. R. 4400.3150 | **Factors to be Considered in Permitting a HVTL**<br>A. effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services | 9.2 |
| | B. effects on public health and safety | 9 |
| | C. effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining | 9.3 |
| | D. effects on archaeological and historic resources | 9.4 |
| | E. effects on the natural environment, including effects on air and water quality resources and flora and fauna | 9.5 |

| Authority | Required Information | Section |
|---|---|---|
| | F. effects on rare and unique natural resources | 9.6 |
| | G. application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity | 4.1; 8.1.2 |
| | H. use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries | 4.1; 8.2 |
| | I. use of existing large electric power generating plant sites | Not applicable |
| | J. use of existing transportation, pipeline, and electrical transmission systems or rights-of-way | 8.2 |
| | K. electrical system reliability | 4.1, |
| | L. costs of constructing, operating, and maintaining the facility which are dependent on design and route | 4.3; 8.6 |
| | M. adverse human and natural environmental effects which cannot be avoided | 9 |
| | N. irreversible and irretrievable commitments of resources | 4.1, 9 |
| Minn. R. 4400.3350, subps. 1 and 2 | Prohibited Routes<br>**Wilderness areas**. No high voltage transmission line may be routed through state or national wilderness areas<br>**Parks and natural areas**. No high voltage transmission line may be routed through state or national parks or state scientific and natural areas unless the transmission line would not materially damage or impair the purpose for which the area was designated and no feasible and prudent alternative exists. Economic considerations alone do not justify use of these areas for a high voltage transmission line | No wilderness areas or parks are crossed |

| Authority | Required Information | Section |
|---|---|---|
| Minn. Stat. §116C.57, subd. 4 (applicable per Minn. Stat. §116C.575, subd. 8) | **Considerations in designating sites and routes** (1) Evaluation of research and investigations relating to the effects on land, water and air resources of large electric power generating plants and high voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including base line studies, predictive modeling, and evaluation of new or improved methods for minimizing adverse impacts of water and air discharges and other matters pertaining to the effects of power plants on the water and air environment | 9 |
| | (2) Environmental evaluation of sites and routes proposed for future development and expansion and their relationship to the land, water, air and human resources of the state | 7; 8.1.2 |
| | (3) Evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants designed to minimize adverse environmental effects | Not applicable |
| | (4) Evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants | Not Applicable |
| | (5) Analysis of the direct and indirect economic impact of proposed sites and routes including, but not limited to, productive agricultural land lost or impaired | 9.3 |
| | (6) Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted | 9 |
| | (7) Evaluation of alternatives to the applicant's proposed site or route proposed pursuant to subdivisions 1 and 2 | 7 |
| | (8) Evaluation of potential routes that would use or parallel existing railroad and highway rights-of way | 8.2; 9 |
| | (9) Evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations | 8.2; 9.3.2 |
| | (10) Evaluation of the future needs for additional high voltage transmission lines in the same general area as any proposed route, and the advisability of ordering the construction of structures capable of expansion in transmission capacity through multiple circuiting or design modifications | 6.2.4; 8.1.2 |

| Authority | Required Information | Section |
|---|---|---|
| | (11) Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved | 9 |
| | (12) When appropriate, consideration of problems raised by other state and federal agencies and local entities | Not applicable |

# 1 EXECUTIVE SUMMARY

## 1.1 Introduction

Otter Tail Power Company (the "company" or "Applicant") is applying to the Minnesota Public Utilities Commission for a Certificate of Need and a Route Permit to rebuild an existing 41.6 kilovolt ("kV") transmission line between Appleton, Minnesota, and Canby, Minnesota, approximately 42 miles, to 115 kV specifications.

Otter Tail Power Company proposes to construct the 115 kV line along the same route as the existing line. The company anticipates that construction will begin in spring 2007 and be completed in about one year so the line can be energized to 115 kV in spring 2008.

## 1.2 Otter Tail Power Company

Otter Tail Power Company is an investor-owned electric utility headquartered in Fergus Falls, Minnesota. The company has provided electric service to customers since 1909. Presently, the company serves about 128,000 customers in three states, about 58,000 of whom reside in Minnesota.

The contact person for Otter Tail Power Company on this Project is Al Koeckeritz, Project Manager, 215 South Cascade Street, Fergus Falls, Minnesota 56538-0496, phone (218) 739-8416, e-mail akoeckeritz@otpco.com.

## 1.3 The Project

The Project consists of the rebuild of an existing transmission line between the Appleton substation and the Canby substation. The line is approximately 42 miles long and will be rebuilt from 41.6 kV to 115 kV. The line lies entirely in Minnesota in the counties of Swift, Lac qui Parle, and Yellow Medicine. The 115 kV line will follow the same route as the 41.6 kV line.

Several substations – the Appleton, Canby, Dawson, and Louisburg substations – will also be modified to accommodate the new line. The South Appleton Junction and a distribution substation called Appleton TV will be eliminated and several miles of distribution line will be removed.

Nearly the entire southern half of the line, the section between Canby and Dawson, is already capable of being operated at 115 kV, and except for a one mile stretch west of Dawson and the connection to the Canby substation, no work other than energizing the line to 115,000 volts is required. On the northern half, the section from Dawson to Appleton, the company must install new taller poles before this portion of the line can be energized to 115 kV. Where new poles have to be installed, they will be single-pole wood structures spaced approximately 250 to 300 feet apart and from 50 to 70 feet high.

Where the line follows a roadway, the necessary right-of-way is 40 feet, and in other locations the company will require up to 80 foot right-of-way. The company has existing

easements for the 41.6 kV line and does not anticipate that any additional property will be required for the line at 115 kV, except perhaps for a short distance near the Canby substation. However, in those places where the company has to replace the poles, primarily on the north half from Dawson to Appleton, the company intends to enter into new easements with these landowners in order to update the language to reflect typical provisions included in today's easements.

The Project will cost approximately $2.6 million.

## 1.4 The Need for the Project

Otter Tail Power Company has been reporting since at least 2001 that load growth in the Appleton/Canby area has caused electrical facilities in the area to exceed their normal operating capabilities. In particular, the transformer at the Canby substation becomes overloaded during extreme summer peak conditions as well as during certain contingency situations such as the loss of another transmission line during storm events. The Appleton area is another area of immediate concern. A second 115 kV source is required to maintain acceptable voltages during contingencies involving the existing 115 kV line between Ortonville and Appleton.

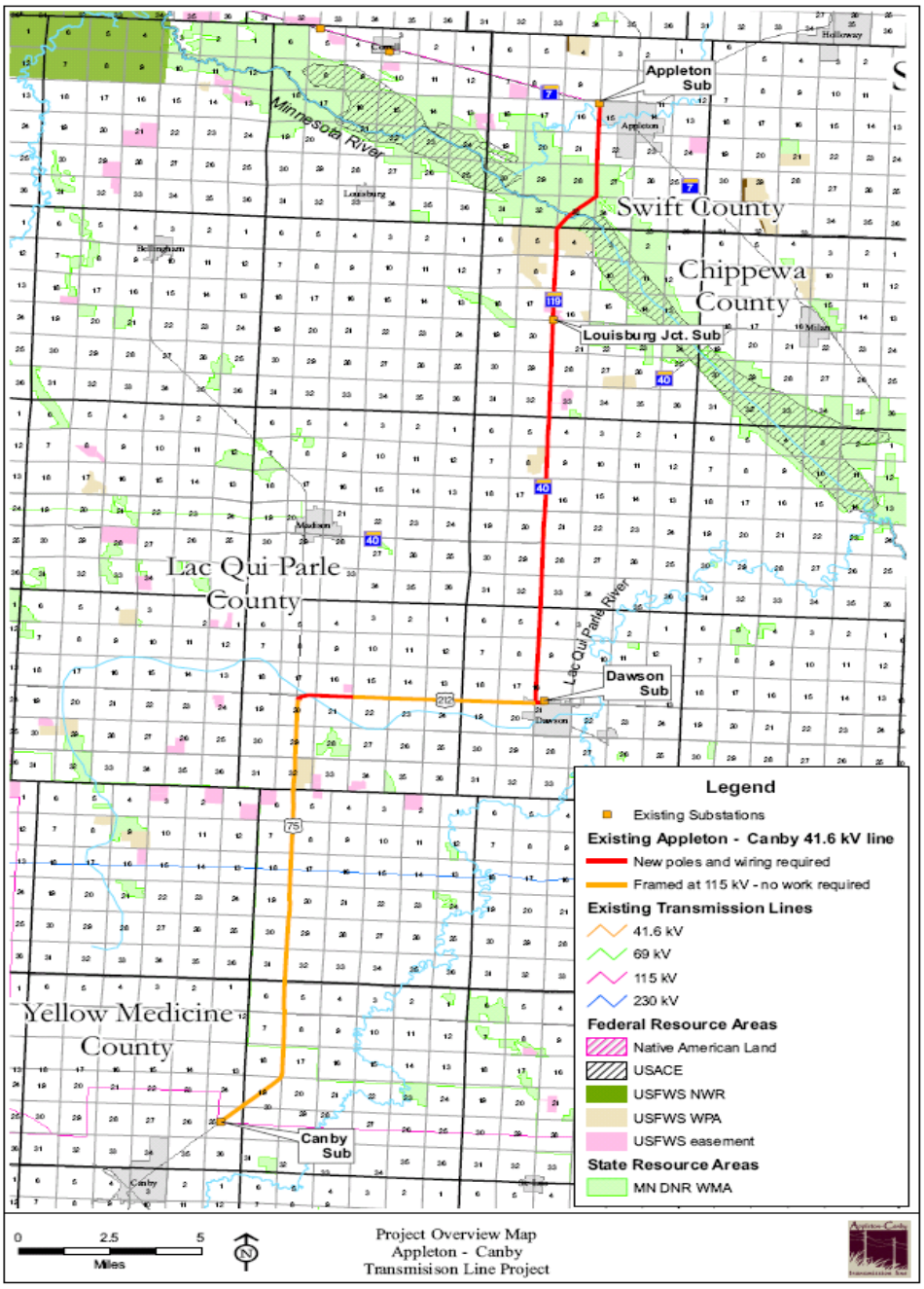
Anticipated increases in energy demand and consumption in the area will continue to threaten service in the Appleton/Canby area. It is expected that the Canby 115/41.6 kV transformer will be overloaded for normal summer peak conditions by the year 2009. The company anticipates that voltage levels in the Dawson area will decrease below acceptable normal operating levels by the year 2008.

The Project will have a direct benefit to customers in Swift, Lac qui Parle, Yellow Medicine, Chippewa, and Big Stone counties in Minnesota. Some customers in a small part of South Dakota and some customers of Missouri River Energy Services and Great River Energy who reside in the area will also benefit.

## 1.5 The Route

The upgraded line will follow the identical route that the 41.6 kV line presently follows. A map showing the route of the line is shown on the following page.

Except for one mile east of U.S. Highway 75 near Dawson, the section of line from Canby to Dawson is already capable of 115 kV operation. The company will also make slight modifications to the line at the Canby substation where the line will have to change its route to the substation. Also, the Canby substation may be moved a short distance to the north, which would require a short stretch of new right-of-way to connect to the substation at the new location. That decision will be made by the Public Utilities Commission in a completely separate matter.


Appleton Sub
Minnesota River
Swift County
Chippewa County
Louisburg Jct. Sub
Lac Qui Parle County
Lac Qui Parle River
Dawson Sub
Yellow Medicine County
Canby Sub
Legend
Existing Substations
Existing Appleton - Canby 41.6 kV line
New poles and wiring required
Framed at 115 kV - no work required
Existing Transmission Lines
41.6 kV
69 kV
115 kV
230 kV
Federal Resource Areas
Native American Land
USACE
USFWS NWR
USFWS WPA
USFWS easement
State Resource Areas
MN DNR WMA
0
2.5
5
Miles
Project Overview Map
Appleton - Canby
Transmisison Line Project

On the north end, the section from Dawson to Appleton, the line will follow the same route along State Highway 119 but the structures could be installed in slightly different locations. Also, the spans will be longer and fewer poles will be required. Otter Tail Power Company is asking the Commission to provide flexibility to allow the company to take landowner requests into consideration in determining the precise location for the poles.

The line will cross the Minnesota River south of Appleton and the Pomme de Terre River at Appleton in the same locations that it crosses those rivers now. The company considered burying the line under the Minnesota River but the cost is prohibitively expensive and the overhead crossing does not interfere with recreational and other benefits associated with the river.

## 1.6 Alternatives

Otter Tail Power Company considered various alternatives to rebuilding the existing 41.6 kV line. Building a separate transmission line was rejected because it did not seem advisable to construct an entirely new line along a different right-of-way when an existing line was available. Adding one or more small generators in the area, whether diesel fired or wind turbines, was determined to be less desirable because such an approach would be significantly more expensive and less reliable than upgrading the line.

## 1.7 Potential Environmental Effects

The company conducted an analysis of the potential environmental effects from the proposed transmission line. No significant unavoidable impacts will result from upgrading the line to 115 kilovolt specifications.

No homeowners will be displaced by the transmission line. All agricultural land impacted during construction will be returned to its natural condition as nearly as possible and landowners will be compensated for any losses from construction. All water bodies will be protected during construction. The electric and magnetic fields (EMF) associated with the new line will be significantly less than the maximum levels permitted by state regulators. No stray voltage issues are anticipated to affect farm animals along the route.

In addition, the Department of Commerce will prepare its own Environmental Assessment analyzing potential environmental impacts from the Project.

## 1.8 Public Involvement

The public will have an opportunity to review the application and submit comments to the Public Utilities Commission about the Project. A copy of the application will be available on the PUC e-filings webpage and on the Otter Tail Power Company webpage at: www.otpco.com.

A public meeting will be held in a few weeks in the area to answer questions about the Project and to solicit public comments and suggestions for matters to examine in the

Environmental Assessment. In a few months after the Environmental Assessment is completed, the Commission will conduct a public hearing in the area at which the company will present evidence and the public will have an opportunity to ask questions and submit comments.

Persons interested in receiving notices and other announcements about the Project can register their names and addresses with the Commission. Persons can register electronically at: http://energyfacilities.puc.state.mn.us/mailinglist.html.

## 1.9 Conclusion

The Public Utilities Commission has established criteria to apply in determining whether a proposed high voltage transmission line is needed. Those criteria are found in rules promulgated by the Commission. Minnesota Rules part 7849.0120. An applicant for a Certificate of Need must show that the probable result of denying the request would be an adverse effect on the future adequacy and reliability of the system, there is not a more reasonable and prudent alternative, the proposed facility will provide benefits to society compatible with protecting the environment, and the Project will comply with all applicable standards and regulations. The company has demonstrated in the application that the upgrade of the existing transmission line to 115 kV has all the positive attributes required to obtain a Certificate of Need.

With regard to route selection for high voltage transmission lines, the applicable rules are found in Minnesota Rules chapter 4400. This Project satisfies the criteria for a route permit: the transmission line conserves resources, minimizes environmental impacts, avoids landowner conflicts, and ensures a reliable, cost-effective power supply to customers in the area.

# 2 GENERAL INFORMATION

## 2.1 The Certificate of Need Requirement

Minnesota Statutes section 216B.243, subdivision 2, provides that "No large energy facility shall be sited or constructed in Minnesota without the issuance of a certificate of need by the [public utilities] commission pursuant to sections 216C.05 to 216C.30 and this section and consistent with the criteria for assessment of need." A large energy facility is defined in Minnesota Statutes section 216B.2421 subdivision 2(3) as, among other things, "any high-voltage transmission line with a capacity of 100 kilovolts or more with more than ten miles of its length in Minnesota."

The proposed 115 kilovolt transmission line will be located in Minnesota between the cities of Appleton and Canby and will be approximately 42 miles long. Because the Project consists of a transmission line in excess of 100 kV and is more than ten miles in length, a Certificate of Need is required.

The Public Utilities Commission has adopted rules for the consideration of applications for certificates of need. Minnesota Rules chapter 7849. On May 15, 2006, the Applicant filed a Petition for Exemption under Minnesota Rules part 7849.0200, subpart 6, requesting that the Applicant be exempt from certain filing requirements under chapter 7849. The Public Utilities Commission granted the Petition on July 20, 2006. This Application contains the information required under the chapter 7849 rules, as modified by the Commission in its Exemption Order. A copy of the Commission's Order is attached hereto as Appendix A.

## 2.2 The Route Permit

Minnesota Statutes section 116C.57, subdivision 2, provides that "[n]o [public utility] may construct a high voltage transmission line without a route permit from the [Public Utilities Commission]." High voltage transmission line is defined by Minnesota Statutes § 116C.52, subdivision 4, as "a conductor of electric energy and associated facilities designed for and capable of operation at a nominal voltage of 100 kilovolts or more and is greater than 1,500 feet in length." Because the Project consists of a transmission line of 115 kilovolts, which is over 100 kilovolts, that is greater than 1,500 feet, a Route Permit is required.

The rules that apply to the review of Route Permit applications are found in Minnesota Rules chapter 4400. Minnesota Rules part 4400.1150, subparts 2 and 3, set forth the information that must be included in a Route Permit application.

Minnesota Statutes section 116C.575, subdivision 2(3) provides an Alternative Review Process for transmission lines between 100 and 200 kilovolts; therefore, this Project qualifies for alternative review. This Alternative Review Process is shorter than the process required for larger transmission lines over 200 kilovolts. The Applicant notified the Commission on August 12, 2006, pursuant to Minnesota Rules part 4400.2000,

subpart 2 of its intent to utilize the Alternative Review Process and file its Route Permit Application under Minnesota Rules parts 4400.2000 to 4400.2950. A copy of the Applicant's notification letter is attached hereto as Appendix B.

Under the Alternative Review Process, an applicant is not required to propose any alternative routes, but must disclose any other routes that were rejected by the applicant. Minnesota Statutes § 116C.575, subd. 3. Further, an Environmental Impact Statement is not required under the Alternative Review Process. Instead, the Department of Commerce is required to prepare an Environmental Assessment. Minnesota Statutes § 116C.575, subd. 5. Unlike the full route permit process for higher voltage lines, which requires a formal contested case hearing, the Commission has discretion to determine what kind of public hearing to conduct. Minnesota Statutes § 116C.575, subd. 6. In Section 2.3 below, the procedures described are those that are required for the lower voltage lines under the Alternative Review Process.

## 2.3 The MPUC Regulatory Process

As a result of legislation passed in 2005, the Public Utilities Commission has jurisdiction over both Certificates of Need and Route Permits. 2005 Minn. Laws ch. 97, art. 3, § 17. Minnesota Statutes section 116C.53, subdivision 2, states that "[t]he [public utilities] commission is hereby given the authority to provide for site and route selection for large electric power facilities." The legislature transferred these siting and routing responsibilities to the Commission in order to "ensure greater public participation in energy infrastructure approval proceedings and to better integrate and align state energy and environmental policy goals with economic decisions involving large energy infrastructure." 2005 Minn. Laws ch. 97, art. 3, § 17.

This matter marks the first time that a utility has filed for a Certificate of Need and a Route Permit at the same time. The Commission has combined a Certificate of Need proceeding and a Route Permit proceeding after the applications were filed separately, but in no other proceeding has an applicant combined the two into one document. The reason the Applicant chose to do so here is that since the preferred route for the proposed transmission line follows an existing transmission line, it was not difficult for the Applicant to compile the necessary information to request a Route Permit at the outset.

Combining the Certificate of Need and the Route Permit proceedings into one proceeding is consistent with the goal of the Legislature to simplify public participation and to expedite agency review and decision-making. The Legislature provided in the 2005 Act transferring siting and routing authority to the MEQB that "Unless the commission determines that a joint hearing on siting and need under this subdivision and section 116C.57, subdivision 2d, is not feasible or more efficient or otherwise not in the public interest, a joint hearing under those subdivisions shall be held." Minnesota Statutes § 216B.243, subd. 4. A joint hearing in this case is certainly feasible, it is definitely efficient, and it will promote the public interest.

The regulatory process described in this section, then, is the process that is followed to satisfy all the requirements under the Certificate of Need rules (chapter 7849) and all the

requirements under the Route Permit rules (chapter 4400). In the end, the Public Utilities Commission can make a decision on the need and authorize construction along a designated route in one proceeding.

The Certificate of Need rules establish requirements that apply prior to the submission of a Certificate of Need application. Minnesota Rules part 7829.2550, subpart 1, requires the applicant for a Certificate of Need to submit a proposed plan for providing notice three months prior to the filing of the application. In this matter, Otter Tail Power Company filed a proposed Notice Plan with the Commission on May 15, 2006. The proposed Notice Plan incorporated the notice requirements of both the Certificate of Need rules (Minnesota Rules part 7829.2550) and the Route Permit rules (Minnesota Rules part 4400.1350). The Commission approved the Notice Plan on July 20, 2006, and issued its written Order on July 31. A copy of the Commission's Order is attached hereto as Appendix A.

In accordance with the approved Notice Plan and the PUC rules, upon filing this Certificate of Need and Route Permit Application, the Applicant will mail a notice of the filing and a summary of the Application to potentially affected landowners, to those persons who have registered their names with the Commission and expressed an interest in large energy projects, and to several tribal governments and local units of government whose jurisdictions are reasonably likely to be affected by the proposed Project. These are the people and governmental bodies that the Applicant identified in the Notice Plan and are required to receive notice under the applicable rules. In addition, the Applicant will publish notice in a number of local newspapers announcing the filing of the Application.

An electronic version of the Application will be provided to the Commission for posting on its webpage and on the e-dockets register. The Applicant will also post the Application on the Otter Tail Power Company homepage with a link to the Appleton-Canby Project. The Otter Tail homepage is www.otpco.com.

Upon submission of an application for a Certificate of Need or a Route Permit, the Department of Commerce (Department) has the obligation to conduct environmental review of the Project. Minnesota Laws 2005, ch. 97, art. 3, § 17 and Minnesota Rules parts 4400.2750 and 4410.7020. In this matter, because the Applicant is applying for both a Certificate of Need and a Route Permit, the environmental review will consider issues relating both to the need for the Project, including size, type, timing, voltage, and system configurations, and also to the proposed route, such as construction impacts, environmental features, and impacts on homeowners. The Department has the option to elect to combine the environmental review and prepare one document called an Environmental Assessment. Minnesota Rules part 4410.7060. The Applicant believes that combining the environmental review into one document is appropriate and preferable in this matter – it is more expeditious, it will be easier for the public to follow, and it is consistent with legislative intent to combine the need and routing processes.

The process the Department must follow in preparing the Environmental Assessment is set forth in Minnesota Rules part 4400.2750. This process requires the Department to

schedule at least one public meeting in the area of the proposed Project. The purpose of the meeting is to advise the public of the Project and to solicit public input into the scope of the environmental review. The Applicant and the Department will both have representatives at the public meeting to answer questions and provide information for the public. The public meeting will be held within sixty days after submission of the Application.

Once the public meeting has been held, the Department will issue a Scoping Order describing the issues and alternatives that will be evaluated in the Environmental Assessment. The Department has four months from the time the Application is submitted to complete the environmental review and prepare the Environmental Assessment. Minnesota Rules part 4410.7030, subpart 9. Upon completion of the document, the Department will publish notice in the *Monitor*, a bi-weekly publication of the Environmental Quality Board that can be accessed on the EQB webpage, www.eqb.state.mn.us/monitor.html, and will mail notice to persons who have registered their names with the Department to receive notices about this Project. Persons wishing to place their names on the mailing list for this Project can do so by contacting the Department directly or electronically on the Department's webpage.

After the Environmental Assessment is completed, the Public Utilities Commission will schedule a public hearing to again solicit public input and to create an administrative record. The Commission will select a person to preside at the hearing; it may be an administrative law judge from the Office of Administrative Hearings or another person acceptable to the Commission. The Commission will establish the procedures to be followed at the hearing. The Environmental Assessment will become part of the record for consideration by the Commission. Interested persons will be notified of the date of the public hearing and will have an opportunity to participate in the proceeding. The hearing will likely be a joint hearing to consider both the Certificate of Need and the Route Permit. Minnesota Rules part 4400.2850.

Once the hearing is concluded, the matter will come to the full Public Utilities Commission for a decision. The Commission will again afford interested persons an opportunity to submit comments.

The Commission has one year from the time a Certificate of Need Application is submitted to reach a final decision. Minn. Stat. §§ 216B.243, subd. 5. A route permit under the Alternative Permitting Process can be issued in six months, Minnesota Statutes § 116C.575, subd. 7, but Minnesota Rules part 4400.1900, subpart 3 prohibits the Commission from making a final decision on a route permit until the certificate of need is approved.

The Applicant anticipates that a final decision on the Certificate of Need and the Route Permit for this Project can be made in the spring 2007.

## 2.4 Public Participation

In accordance with its Notice Plan, the Applicant held public forums on June 21, 2006, at the Lac qui Parle school near Dawson and on June 22, 2006, in the city of Canby. Approximately 17 members of the public, including governmental officials, attended the June 21 public forum near Dawson and 12 members of the public attended the June 22 public forum in Canby.

Both meetings were publicized in ten local papers approximately one week prior to the public forums, and landowners potentially impacted received a letter of invitation. Local government officials and interested parties listed with the Public Utilities Commission were invited by letter. Available at the public forums were large maps of the proposed route, photo simulations of proposed transmission structures, and folders for distribution containing a Project description and map, right-of-way information, and a post card for questions or comments.

Inquiries from the public included whether the transmission line will go though their property, whether any of the line will be newly constructed or built underground, Project schedule, and future needs for transmission. Other inquiries included compensation for the easement, the condemnation process, stray voltage and EMF effects, and whether the transmission line could support wind energy.

## 2.5 Other Permits/Approvals

In addition to the Certificate of Need and Route Permit applied for in this document, several other permits may be required for the Project depending on the actual route selected and the conditions encountered during construction. These are the same kind of permits utilities have identified in other applications to the PUC for authorization to construct similar high voltage transmission lines and there is nothing unusual about the permits that may be required in this case. See the Tower and Badoura 115 kV Projects, PUC Docket No. EO15/TL-05-867, and the RDO 115 kV Project, PUC Docket No. ET2/TL-06-468 for reference.

Table 1 below contains a list of the local, state and federal permits that might be required for this Project.

**Table 1. List of Possible Permits**

| Permit | Jurisdiction |
|---|---|
| Local Approvals | |
| Road Crossing/ROW Permits | County, Township, City |
| Lands Permits | County, Township, City |
| Building Permits | County, Township, City |
| Overwidth Loads Permits | County, Township, City |
| Driveway/Access Permits | County, Township, City |
| Minnesota State Approvals | |
| Endangered Species Consultation | MN DNR – Ecological Services |
| License to Cross Public Waters | MN DNR – Lands and Minerals |
| License to Cross Public Lands | MN DNR – Lands and Minerals |
| Utility Permit | Mn/DOT |
| Wetland Conservation Act | BWSR |
| NPDES Permit | MPCA |
| Federal Approvals | |
| Section 10 Permit | Corps of Engineers |
| Section 404 Permit | Corps of Engineers |
| Permit to Cross Federal Aid Highway | FHWA |
| Spill Prevention, Control and Countermeasure (SPCC) Plan | EPA |
| | |

### 2.5.2 Local Approvals

The Applicant will work with local units of government to address any concerns related to the following possible approvals.

- *Road Crossing/Right-of-Way Permits*

These permits may be required to cross or occupy county, township, and city road ROW.

- *Lands Permits*

These permits may be required to occupy county, township, and city lands such as park lands, watershed districts, and other properties owned by these entities.

- *Building Permits*

These permits may be required by the local jurisdictions for substation modifications and construction.

- *Over width/Loads Permits*

These permits may be required to move over width or heavy loads on county, township, or city roads.

- *Driveway/Access Permits*

These permits may be required to construct access roads or driveways from county, township, or city roadways.

### 2.5.3 State of Minnesota Approvals

- *Endangered Species Consultation*

The Minnesota DNR Natural Heritage and Nongame Research Program collects, manages, and interprets information about nongame species. Consultation was requested from the department for the Project regarding rare and unique species.

- *License to Cross Public Lands and Waters*

The Minnesota DNR Division of Lands and Minerals regulates utility crossings over, under, or across any State land or public water identified on the Public Waters and Wetlands Maps. A license to cross Public Waters is required under Minnesota Statutes § 84.415 and Minnesota Rules chapter 6135. The Proposed Project will require a license to cross Public Waters for the Minnesota River crossing, the Pomme de Terre River crossing, and the West Branch of the Lac qui Parle River crossing (all Public Waters that will be crossed by the rebuild segments). The Proposed Project will require a license to cross Public Lands for the Lac qui Parle WMA crossing. The Applicant has begun coordination with the DNR regarding these licenses. The Applicant will file these license applications once the design of the transmission line is complete and will acquire the licenses prior to construction.

- *Utility Permit*

A permit from the Mn/DOT is required for construction, placement, or maintenance of utility lines that occur adjacent or across the highway ROW. The Applicant will file for this permit once the design of the transmission line is complete and will acquire the permit prior to construction.

- *Wetland Conservation Act*

The Minnesota Board of Water and Soil Resources ("BWSR") administers the state Wetland Conservation Act, under Minn. Rules chapter 8420. The proposed project may

require a permit under these rules if permanent impacts to wetlands are anticipated to result from construction. The Applicants will apply for this permit (which is a joint application with the Section 404 permit) once a route is established for the project.

- *NPDES Permit*

A NPDES permit is required for stormwater discharges associated with construction activities disturbing equal to or greater than one acre. A requirement of the permit is to develop and implement a stormwater pollution prevention plan (SWPPP), which includes BMPs to minimize discharge of pollutants from the site. This permit will be acquired if the construction or expansion of substations will cause a disturbance of greater than one acre.

### 2.5.4 Federal Approvals

- *Section 10 Permit*

The Army Corps of Engineers regulates impacts to navigable waters of the United States. The Minnesota River is classified by the Army Corps of Engineers as a navigable water, and the Applicant will apply for a permit the crossing proposed for the Project.

- *Section 404 Permit*

A Section 404 permit is required from the Army Corps of Engineers for discharges of dredged or fill material into waters of the United States. The Applicant will apply for these permits once a route is awarded for the Project.

- *Spill Prevention, Control and Countermeasure (SPCC) Plan*

A SPCC plan is required to prevent discharge of oil into navigable waters of the United States, and is required if the aboveground storage capacity for the substance is greater than 1,320 gallons and there is a reasonable expectation of a discharge into navigable waters of the United States. The Applicant will update and develop their SPCC plans at substations meeting the criteria per 40 CFR 112.

- *Other*

It should be noted that the Applicant has been coordinating with the USFWS regarding USFWS lands that will be crossed by the proposed Project. Because existing easements within USFWS lands will be used for the rebuild of the existing line, the USFWS has indicated that no permits or licenses will be required. The Applicant will continue to coordinate with the USFWS in order to determine appropriate construction methods and timing within these lands.

# 3 THE APPLICANT

## 3.1 Proposed Ownership

Otter Tail Power Company will be the sole owner of the proposed 115 kV transmission line between the substation in Appleton, Minnesota, and the substation in Canby, Minnesota. Missouri River Energy Services ("MRES") and Great River Energy ("GRE") do have customers in this area who will benefit directly from this line, but they do not own any portion of the line. MRES does own the Appleton substation. The Canby, Dawson, and Louisburg substations are owned by Otter Tail Power Company.

## 3.2 History

Otter Tail Power Company has provided electric service to customers in its service area since 1909 when its Dayton Hollow hydroelectric plant went online to serve its first customer, the Northern Light Electric Company in Wahpeton, North Dakota. The company began serving communities in this specific area in the 1920s. The current 41.6 kilovolt transmission line was built around 1945. In 1982, to meet customers' growing demand for electricity, the company began upgrading portions of the line to be capable of transmitting electricity at 115 kilovolts. At that time a lightning shield was added to the lines to improve reliability for area customers.

## 3.3 Organization

Otter Tail Power Company is an investor-owned electric utility headquartered in Fergus Falls, Minnesota. Besides providing its customers with electricity as reliably and economically as possible, the company also provides a significant source of revenue for community governments and schools in its service area. In 2006 the company expects to pay nearly $27 million in federal and state income taxes and local property taxes.

Otter Tail Power Company's base load generation facilities include the Big Stone Plant at Milbank South Dakota, the Coyote Station at Beulah, North Dakota, and the Hoot Lake Plant at Fergus Falls, Minnesota. With a combined capacity of 548 megawatts, these facilities generate most of the company's electricity. The company also purchases 25 megawatts of electricity from wind farms. In 2005 about 10 percent of its energy came from renewable resources such as hydroelectric, wind, and biomass.

Otter Tail Power Company's 750 employees provide services directly to the customers. They design, build, operate, and maintain electric transmission and distribution facilities, as well as the generation facilities the company owns and operates.

The company's electric system is interconnected directly with neighboring suppliers. It is a member of the Midwest Reliability Organization ("MRO") and the Midwest Independent Transmission System Operator ("MISO").

Otter Tail Power Company is the utility operation of Otter Tail Corporation. Otter Tail Corporation's common stock trades under the symbol OTTR on The Nasdaq Stock Market®.

## 3.4 Service Area

Otter Tail Power Company serves 128,000 customers in 423 communities in Minnesota, North Dakota, and South Dakota. Its 50,000-square-mile- service area is roughly the size of the state of Wisconsin. The company's electric load is predominately rural and only three towns served by Otter Tail Power Company have a population of 10,000 or more, with no town having a population of over 20,000. Within its service area, the company maintains Customer Service Centers in Bemidji, Crookston, Fergus Falls, and Morris, Minnesota, Devils Lake, Garrison, Jamestown, Oakes, Rugby, and Wahpeton, North Dakota, and Milbank, South Dakota.

Approximately 58,000 of Otter Tail Power Company's customers are located in Minnesota. The area to be benefited by the proposed Project consists primarily of customers in the counties of Lac qui Parle, Chippewa, Big Stone, Swift, and Yellow Medicine, although some customers in other Minnesota counties and in a small portion of South Dakota will also realize benefits. Approximately 25,000 people live in these five counties, although the number of actual customers is far less than the number of residents.

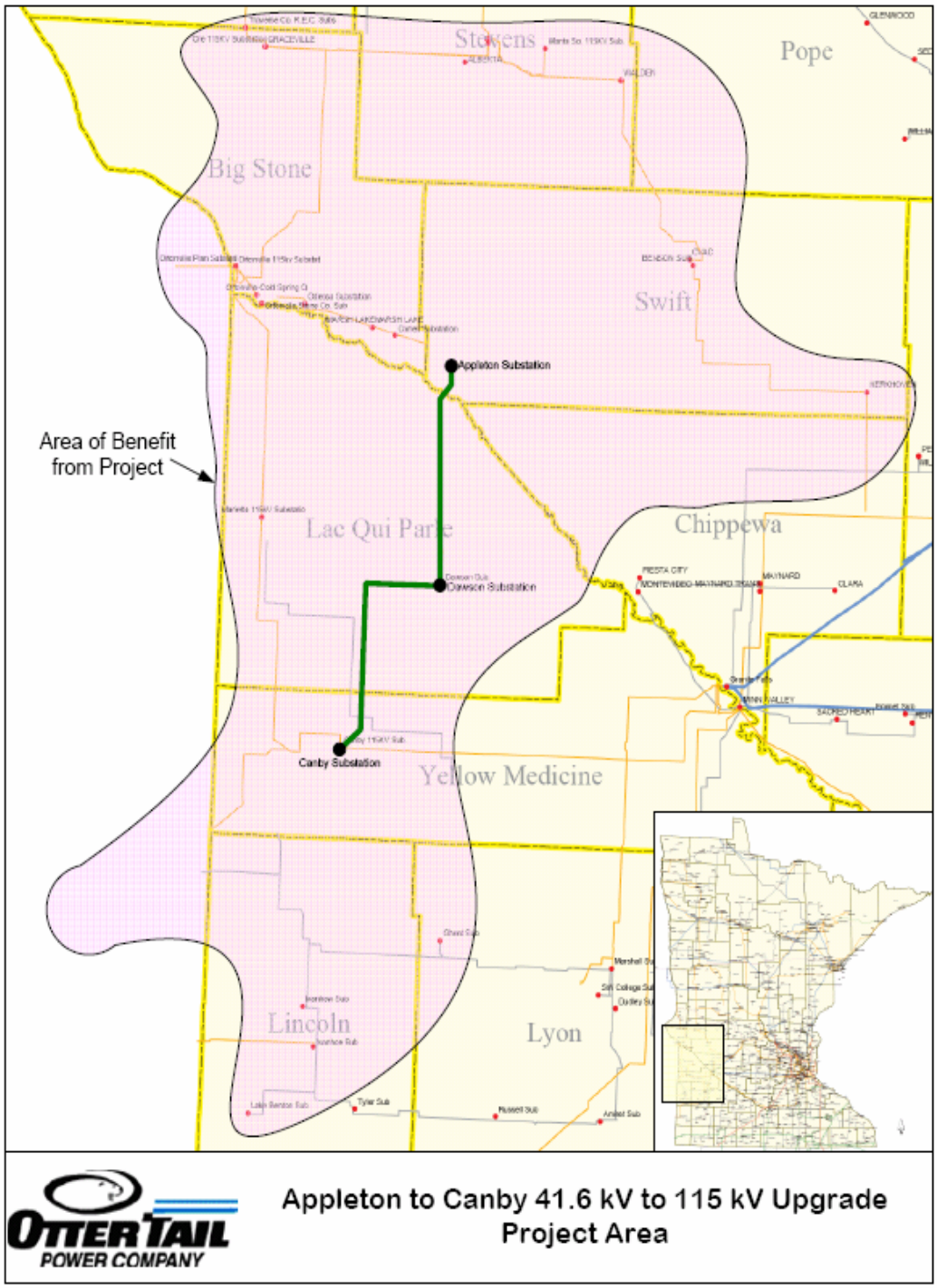
A map showing the area to be served is on the following page.

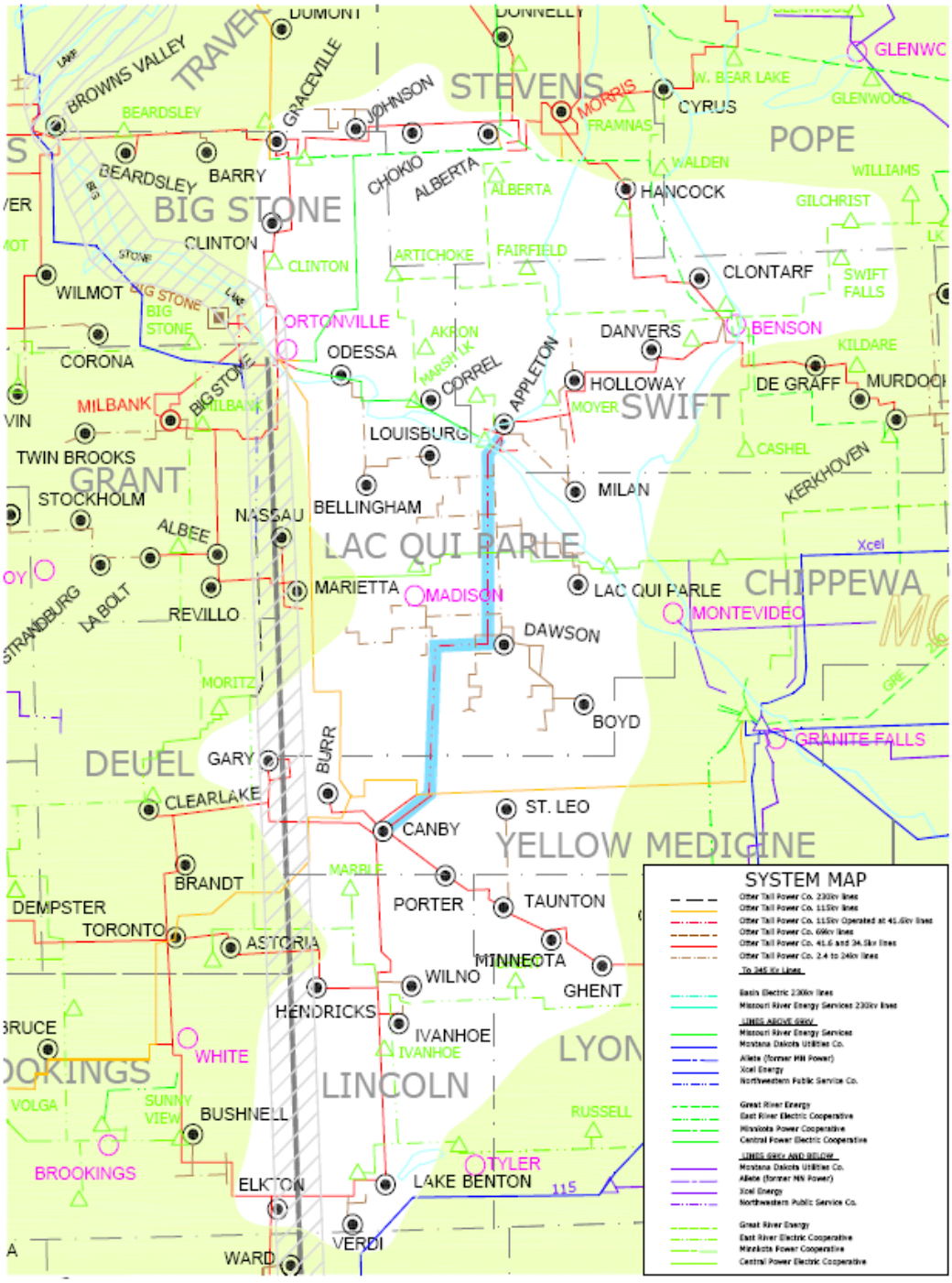
## 3.5 Existing Transmission System

The transmission system in the area to be served by the Appleton/Canby line is made up of 115 kV lines and 41.6 kV lines. The 115 kV lines are the backbone of the electrical system in this area. The 41.6 kV lines serve as feeders from the 115 kV lines. The 115 kV source at Appleton is a radial line that is served out of the Ortonville, Minnesota, substation. The 115 kV source at Canby is served from Granite Falls, Minnesota, and from Big Stone, South Dakota. The 41.6 kV system was built in the 1940's and has served the area well since that time. The 115 kV system evolved over time as local load grew and the 41.6 kV system became incapable of providing reliable electric service to the area.

Many of the electric facilities in the area are shared facilities with other electric providers. Otter Tail Power Company as well as the other utilities have used these shared facilities to provide long-term benefit to the electric customers in the area.

A map showing the transmission lines in the area to be served in shown on the page after the map of the service area.


Stevens
Pope
Big Stone
Swift
Appleton Substation
Area of Benefit
from Project
Lac Qui Parle
Chippewa
Dawson Substation
Canby Substation
Yellow Medicine
Lincoln
Lyon
OTTER TAIL
POWER COMPANY
Appleton to Canby 41.6 kV to 115 kV Upgrade
Project Area


BROWNS VALLEY
TRAVERSE
DUMONT
GRACEVILLE
JOHNSON
STEVENS
MORRIS
CYRUS
W. BEAR LAKE
GLENWOOD
GLENWC
POPE
FRAMNAS
WALDEN
WILLIAMS
GILCHRIST
HANCOCK
BEARDSLEY
BARRY
BIG STONE
CHOKIO
ALBERTA
CLINTON
ARTICHOKE
FAIRFIELD
CLONTARF
SWIFT FALLS
WILMOT
ORTONVILLE
AKRON
ODESSA
DANVERS
BENSON
KILDARE
CORONA
MARSH LK
CORREL
APPLETON
HOLLOWAY
MOYER
SWIFT
DE GRAFF
MILBANK
LOUISBURG
CASHEL
KERKHOVEN
TWIN BROOKS
GRANT
STOCKHOLM
BELLINGHAM
MILAN
NASSAU
ALBEE
LAC QUI PARLE
Xcel
MARIETTA
MADISON
LAC QUI PARLE
CHIPPEWA
MONTEVIDEO
LA BOLT
REVILLO
DAWSON
MORITZ
BOYD
GRANITE FALLS
DEUEL
GARY
BURR
CLEARLAKE
ST. LEO
CANBY
YELLOW MEDICINE
MARBLE
BRANDT
PORTER
TAUNTON
DEMPSTER
TORONTO
ASTORIA
MINNEOTA
WILNO
GHENT
HENDRICKS
IVANHOE
WHITE
LINCOLN
LYON
VOLGA
SUNNY VIEW
BUSHNELL
RUSSELL
BROOKINGS
TYLER
ELKTON
LAKE BENTON
115
VERDI
WARD
SYSTEM MAP

# 4 THE PROJECT

## 4.1 Project Description

Otter Tail Power Company is proposing to construct and operate a 115 kV transmission line between a substation in Appleton, Minnesota, and a substation in Canby, Minnesota. The line is approximately 42 miles long and will replace an existing 41.6 kV line between the two substations. The line lies entirely in Minnesota, in the counties of Swift, Lac qui Parle, and Yellow Medicine.

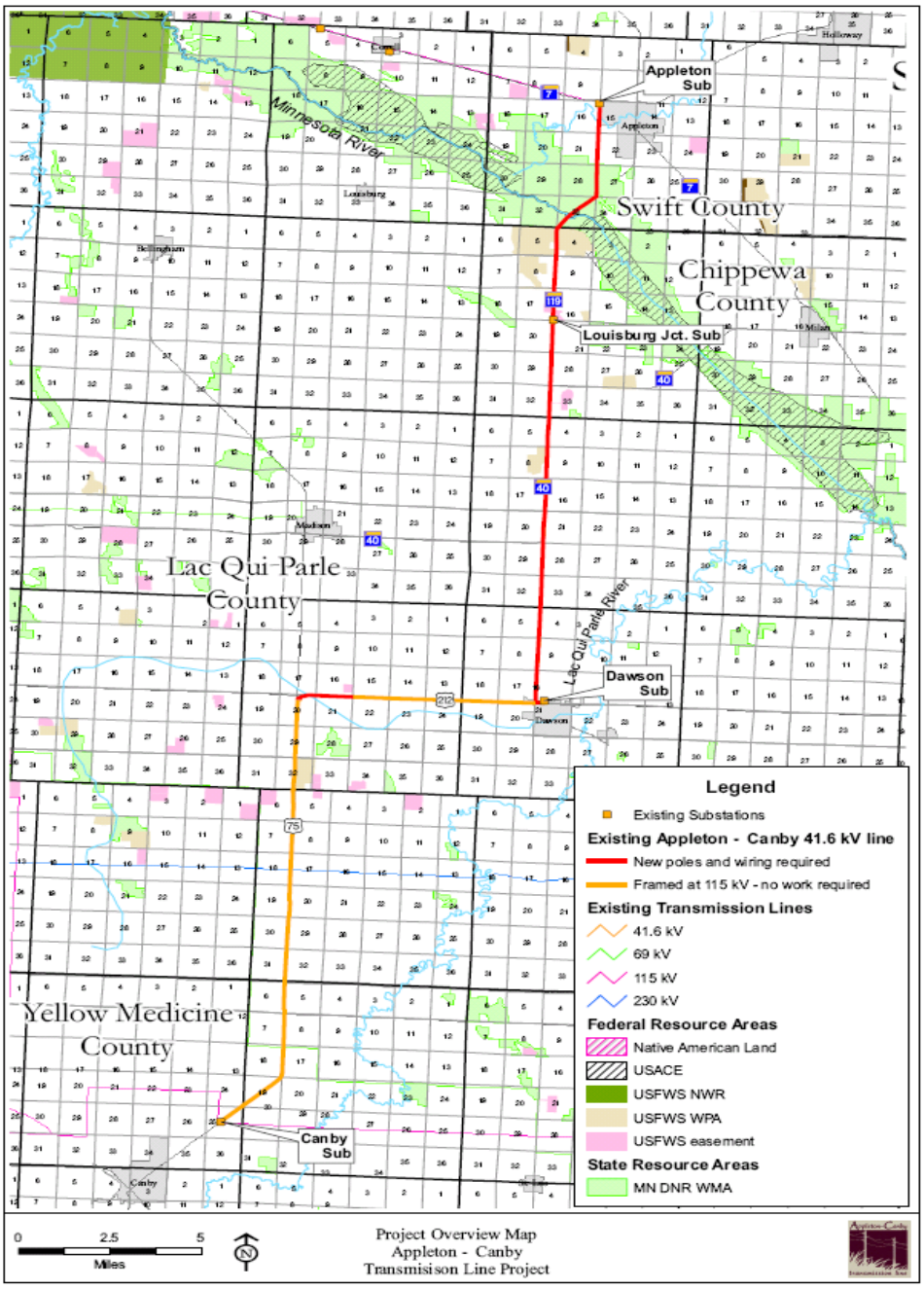
Approximately 21 miles of the line south from the Dawson substation to the Canby substation are already capable of transmitting power at 115 kV, although the line is operated presently at 41.6 kV. No physical changes will occur along the southern half of the line, with the exception of one mile of the line west of the Dawson substation and east of U.S. Highway 75 and a short segment near the Canby substation. Also, the Applicant and others have requested authorization to move the location of the Canby substation a short distance to the north as part of the Big Stone Transmission Project. PUC Docket No. CN-05-619. The Applicant requests approval of a route to connect to the Canby substation wherever it is located.

The northern 21 miles of the line, from the Dawson substation to the Appleton substation, will have new structures installed and a new static wire installed but the conductor will not be replaced. When the structures on the northern half of the line and the one mile segment west of Dawson are replaced and the substations modified, the entire 42 miles of line will be energized to 115,000 volts.

**Proposed Route.** The route preferred by the Applicant is exactly the same route the existing 41.6 kV line follows, except for the necessity to connect to the Canby substation on the southern end. A map showing the route is found on the following page and detailed aerial photos of the entire route are included in Appendix C.

On the north end, the line begins at the Appleton substation on the northwest corner of the city of Appleton. The line follows section lines due south for three miles from the Appleton substation paralleling MN State Highway 119. The line then cuts diagonally across Section 33 of Appleton Township in Swift County and crosses the Minnesota River, where it again travels due south along MN State Highway 119 about twenty miles to the Dawson substation.

From the Dawson substation the line turns due west for about six miles along U.S. Highway 212, then turns due south at the intersection of Highway 212 and U.S. Highway 75. The line parallels Highway 75 for about twelve miles, where it cuts diagonally through Section 19 of Oshkosh Township in Yellow Medicine County and runs to the Canby substation.


Appleton Sub
Minnesota River
Swift County
Chippewa County
Louisburg Jct. Sub
Lac Qui Parle County
Lac Qui Parle River
Dawson Sub
Yellow Medicine County
Canby Sub
Legend
Existing Substations
Existing Appleton - Canby 41.6 kV line
New poles and wiring required
Framed at 115 kV - no work required
Existing Transmission Lines
41.6 kV
69 kV
115 kV
230 kV
Federal Resource Areas
Native American Land
USACE
USFWS NWR
USFWS WPA
USFWS easement
State Resource Areas
MN DNR WMA
0
2.5
5
Miles
Project Overview Map
Appleton - Canby
Transmisison Line Project

The line will cross the Minnesota River south of Appleton and the Pomme de Terre River at Appleton in the same locations that it crosses those rivers now. The company considered burying the line at the Minnesota River but the cost is prohibitively expensive and the overhead crossing does not interfere with recreational and other benefits associated with the river.

While the proposed route is the same as the route the existing 41.6 kV line presently follows, the structures could be installed in slightly different locations where new poles are required. The Applicant is requesting that the Public Utilities Commission authorize a route that is 2000 feet in width, 1000 feet either side of the centerline down the existing route. Designating a route 2000 feet in width will provide the Applicant with flexibility to accommodate landowner desires when it comes time to determine the location of the structures along those stretches where the structures will be replaced. The actual right-of-way width will not change once the structures are installed, and the company would not install structures on property where structures do not presently exist without landowner agreement. However, a route wider than the required right-of-way simply affords the company flexibility to move structures from their present locations if the company and the landowner prefer the new location.

**Right-of-Way.** Where the right-of-way parallels a road, the actual easement necessary for the line is no more than 40 feet wide, depending on the structure size and location. If there is a need to move away from the road right-of-way, then an 80 foot right-of-way is required to comply with applicable safety standards for such structures. The Applicant has worked closely with the local, state and federal agencies and landowners, and all of the parties involved so far favor keeping the line in its current location. The existing right-of-way is adequate if the line remains where it is, although the Applicant anticipates negotiating new easements with many of the landowners where new structures are required in order to bring the easements into conformance with present day provisions.

**Structures.** The 115 kV line will consist of single-pole wood structures spaced approximately 250 to 300 feet apart. Typical structures for the 115 kV voltage level vary from 50 to 70 feet in height, dependent upon the terrain. Also, the spans will be longer and fewer poles will be required.

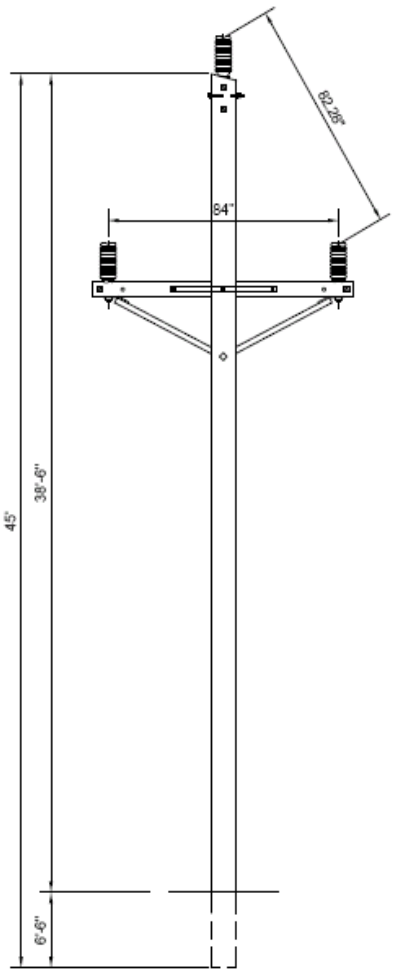
A typical single-pole, tangent 115 kV structure is shown on the following page.

**Conductors.** The existing conductors will remain in place on the rebuilt line sections. Presently the existing conductor is a mix of 266.8 (18/1) ACSR, 266.8 (26/7) ACSR and 266.8 (7 str.) AA.

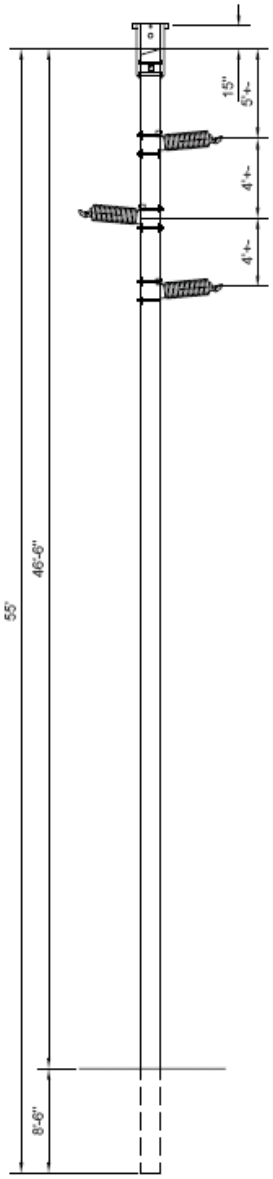
In addition, a static wire will be installed on the top of the new structures. The sections of line already constructed for operation at 115 kV already have a static wire installed for protection.

**Service Life.** The service life of the line is approximately 40 years. It is quite possible, based on experience, that the line and structures will last longer than 40 years.

# APPLETON/ CANBY
## POLE FRAMINGS




EXISTING 41.6KV




PROPOSED 115KV

**Annual Availability.** The new transmission line is expected to be available close to 100% of the time. Except for natural events such as tornadoes and snowstorms, the Applicant expects that this line should not be out of service for any extended period of time.

## 4.2 Associated Facilities

The proposed Project includes changes in the substations at Canby, Dawson, Louisburg Junction, and Appleton.

**Canby Substation.** The company intends to end the new line at the Canby substation. However, the company is planning to move the existing Canby substation to a new location nearby. The location of the Canby substation will be determined in a separate proceeding. In the Matter of the Big Stone Transmission Project, PUC Docket No. CN-05-619. The 115 kV line that is the subject of this proceeding will be routed to the new substation site. A map showing the proposed new location for the Canby substation is included in Appendix C.

**Dawson Substation.** The Dawson substation will have to be increased in size to accommodate the higher voltage line. Currently the company is studying the electrical system needs for the community of Dawson. The study will determine if the company needs to change the distribution voltage for the community and whether there will need to be one or two transformers in the substation. Due to new high voltage protection requirements, the company will need to purchase additional land for the substation changes.

**Louisburg Junction Substation.** The Louisburg Junction substation was rebuilt approximately 15 years ago and it was designed to accommodate 115 kV. The company will only need to change out the substation transformer to allow operation of the substation at 115 kV.

**Appleton Substation.** The Appleton substation will need to be modified to accommodate the new 115 kV switchgear and the new 115 kV tap. The additions required for this work can be contained within the existing substation fence. Otter Tail Power Company will work with MRES, as the owner of the substation, to minimize any impact to other equipment at the site.

In addition to modifying the above four substations, the company will also eliminate the Appleton TV substation, (a small substation south of Appleton), and serve this load from the Milan Junction substation. By doing this the company will be able to remove two miles of existing 41.6 kV transmission line running to the east from MN State Highway 119.

Also, the company will eliminate the South Appleton Junction bus, which will not be necessary when the line is energized to 115 kilovolts.

### 4.3 Estimated Cost

The total cost of the Project is $2.6 million (in 2006 dollars.) The estimated cost of construction of the 115 kV line is approximately $1.7 million in 2006 dollars. The modifications to the substations are estimated to cost $450,000 in 2006 dollars. The remaining $450,000 of the total $2.6 million cost are administrative fees, incurred for such tasks as planning, designing, and permitting.

Annual operating and maintenance costs are estimated to be less than $22,000 for the line.

### 4.4 Effect on Rates

At a cost of $2.6 million, this Project is not likely to have an effect on Otter Tail Power Company's rates. In addition, the company will realize a savings over time from the lower line losses associated with the 115 kV line as compared with the 41.6 kV line. See discussion in section 4.6 below.

### 4.5 Project Schedule

Provided the Applicant obtains a Certificate of Need and a Route Permit early in 2007, the company plans to commence construction in the spring of 2007. Construction will begin on the north end with a rebuild of approximately 3.5 miles of the line from the Appleton substation to South Appleton Junction. The Applicant would then remove the South Appleton Junction bus and continue south to the Louisburg Junction substation. Once that is completed, approximately eleven miles of line will be rebuilt from the Louisburg substation to the Dawson substation. The one mile of line west of the Dawson substation that must be rebuilt will then be constructed. Finally, the last phase of the construction will be to construct a short segment to Canby substation, most likely in a new location approved by the Commission in a separate proceeding.

The company anticipates that construction will take approximately one year and that the entire line will be energized to 115 kV sometime in the first half of 2008. Portions of the line may be energized to 115 kV while work continues on other portions if the company determines it is appropriate to do so.

### 4.6 Estimated Line Losses

When electrical power is sent over a transmission line, some of it is lost through its conversion into heat from the resistance in the conductor (the wire). The amount of line losses that occur is directly related to the square of the current flowing through the transmission line. Higher voltages need less current to provide the same amount of power. Therefore, the higher the voltage, the lower the current, the lower the amount of losses. Also, since the current across a transmission line can very over time, losses are seldom constant from hour to hour, or from month to month.

Transformers have different type of loss characteristic related to the physical construction. Losses that occur within a transformer are primarily due to electrical characteristics of the iron core and copper windings within a transformer.

Losses are actually a measure of the real power flow across the system lost within the elements of the transmission system. Due to losses occurring on the transmission system, it is necessary for utilities to provide enough generation to serve their respective loads (plus reserves), taking into account the loss of the energy before it can be usefully consumed.

The value of losses includes two important components: capacity and energy. The capacity component of losses represents the generation used to supply load and losses. Decreasing losses on the system results in real savings, as it defers the need for additional generation additions or purchases, and also avoids fuel costs. The energy component of losses represents the real power consumed by the resistive elements of the transmission system.

In determining the amount of losses associated with a particular transmission line, it is not possible to consider only the one line and calculate the losses directly from operation of that line. It is necessary to look at the losses of the system that result with and without the proposed line. In this case the Applicant considered a significantly larger area served by a number of utilities to determine the resulting effect from upgrading the Appleton/Canby line from 41.6 kV to 115 kV. The results are shown below in Table 2.

**Table 2. Summary of Line Losses**

| | Losses During Summer Peak Loading | Losses During Average Loading | Losses During Winter Peak Loading |
|---|---|---|---|
| 1 **Existing System** | 1,552.12 MW | 1,591.38 MW | 1,350.55 MW |
| 2 **Appleton-Canby 115 kV** | 1,551.39 MW | 1,591.11 MW | 1,349.94 MW |
| **Loss Difference (1 - 2)** | **0.73 MW** | **0.27 MW** | **0.61 MW** |

The table shows that upgrading the Appleton/Canby line from 41.6 kV to 115 kV reduces the losses to the electrical system. Under summer peak conditions, the losses incurred are 0.73 MW less when operated at 115 kV than it would be when operated at 41.6 kV. Under average conditions, the 115 kV operation results in 0.27 MW of less losses.

This reduction in system losses results in a present value savings of capacity of $949,525 and a present value savings of energy of $814,289, over the life of the proposed transmission line. The value of capacity is a present worth analysis of the average annual cost of demand losses. Likewise, the value of energy savings is a present worth analysis of the average annual cost of energy losses.

## 4.7 Construction Practices

The Applicant intends to employ normal construction practices in the installation of this line. No unusual or difficult features are expected along the route. The construction practices to be followed are described in more detail in Section 8.4.1.

## 4.8 Operation and Maintenance Practices

Access to the right-of-way of a completed transmission line is required periodically to perform inspections, conduct maintenance, and repair damage. Regular maintenance and inspections will be performed during the life of the facility to ensure its continued integrity. Generally, the Applicant will inspect 115 kV lines for any problems every other year and arrange for inspection by ground personnel on foot, snowmobile, ATV or truck. Inspections will be limited to the right-of-way and areas where obstructions or terrain may require off-right-of-way access. If problems are found during inspection, repairs will be performed and the landowners will be compensated for any losses incurred.

The right-of-way will be managed to remove vegetation that interferes with the operation and maintenance of the line. The Applicant's practice provides for the inspection of 115 kV transmission lines every two years to determine if clearing is required. Right-of-way clearing practices include a combination of mechanical and hand clearing, along with herbicide application where allowed to remove or control vegetation growth. The transmission line will be routed through agricultural land with relatively little tree maintenance required. Structures will be new so very little maintenance will be required for several years.

## 4.9 Work Force Required

Company employees will design, construct and maintain the proposed facilities. All workers will be employees of the Applicant.

It is not expected that additional permanent jobs will be directly created by construction of the Project. The construction activities will provide a seasonal influx of additional dollars into the communities during the construction phase, and other materials may be purchased from local vendors where feasible.

## 5.1 Summary of Need

The upgrade of the Appleton to Canby 41.6 kV transmission line is needed to address a load serving issue in the Yellow Medicine, Lac qui Parle, Chippewa, Big Stone, and Swift County area. Load growth in this area has caused electrical facilities to exceed allowable capacities under certain conditions.

Presently, the Canby 115/41.6 kV transformer is at or near its thermal capacity. Under unusually high summer peak loads, exemplified by the hot weather experienced in July of 2006, the load at Dawson that is normally served from Canby must be served from the Appleton source in order to avoid damaging the Canby transformer. Additionally, the area around Appleton experiences unacceptable voltage levels during contingencies of the radial 115 kV line that extends to Appleton from Ortonville.

As load continues to grow in the Appleton/Canby area, the existing problems will continue to worsen. It is anticipated that by 2009 the Canby transformer will overload during typical peak loading conditions. Also, voltage levels at Dawson will drop below safe operating levels during peak conditions starting in 2008. Finally, voltage levels in the Canby area will fall below acceptable voltage levels starting in the year 2009 for the loss of the Canby 115/41.6 kV transformer.

The proposed line upgrade will provide multiple benefits to the Appleton/Canby area. First, the upgrade will place the loads at Appleton, Louisburg and Dawson, which are currently on radial systems, on a looped 115 kV system. A looped system provides reliable backup sources for these loads in the event of a loss of a line. In the Appleton area, the addition of a second 115 kV source alleviates low post-contingent voltage issues.

In the Canby area, removing the load at Dawson from the 41.6 kV system and placing it on the 115 kV system unloads the Canby 115/41.6 kV transformer, extending its ability to serve the remaining Canby 41.6 kV system. Furthermore, removing the Dawson load from the Canby 41.6 kV system enables backup sources to provide adequate voltage support during the loss of the Canby 115/41.6 kV transformer.

The Applicant reported on this situation in the 2003 and 2005 Biennial Transmission Planning Reports. (The Biennial Reports are available at www.minnelectrans.com) This Project is described in the 2005 Biennial Report at Tracking Number 2003-WC-N10.

## 5.2 Data Exemptions

On May 15, 2006, the Applicant submitted a Petition for Exemption to the Public Utilities Commission requesting that the Applicant be exempted from certain filing requirements of the PUC rules relating to information that must be included in a Certificate of Need application. The PUC, after soliciting and considering comments

from interested persons, granted the exemption request on July 20, 2006, and issued its written Order on August 1, 2006. A copy of the Order is attached as Appendix A. In its Order, the PUC relieved the Applicant from submitting certain information required under Minnesota Rules chapter 7848 and specified other type of information that should be included in the CON application instead.

The Applicant has included in this Application the information relating to the need for this new transmission line required by the PUC rules, as modified by the Commission in its Order granting the exemption request. The following summarizes the exemptions that were granted.

Minnesota Rules part 7848.0220, subpart 3. The Appleton substation is owned by Missouri River Energy Services. However, since the 115 kV transmission line will be owned entirely by Otter Tail Power Company, the PUC exempted the Applicant from the requirement to provide all the information required by the PUC rules for each owner of any of the facilities involved in the Project. Therefore, information regarding MRES is not included in this Application, although the Applicant has included in its analysis all customers within the service area, including customers served by MRES.

Minnesota Rules part 7848.0270, subparts 1 and 2. The PUC granted the Applicant's request for an exemption from certain portions of rule 7848.0270 requiring information on predicted energy consumption for the utility's entire service area. Because the transmission line proposed here is intended to serve the several county area surrounding the line, the PUC authorized the Applicant to provide the requested data only for the smaller service area to be served rather than for its entire service area over three states. Also, the PUC exempted the Applicant from providing data about weekday load factors and did not require the Applicant to break out the information into separate consumer groups. The PUC further allowed Otter Tail Power Company to provide an aggregated forecast without having to provide individual forecasts for Otter Tail Power Company, MRES and GRE.

Minnesota Rules part 7848.0280. The PUC exempted the Applicant from submitting information relating to generation capacity because that information is required for new generating facilities, not transmission lines. Also, because the Appleton/Canby area is a summer peaking area, the PUC exempted the Applicant from providing data about peak winter demand.

Minnesota Rules part 7848.0290. This rule requires an applicant to submit information about its conservation programs throughout its entire system. The PUC authorized the Applicant to provide this information only with respect to the service area involved.

## 5.3 Service Area

Because much of the information provided in this Section relates to the service area to be served by the proposed transmission line, it is important to describe the area in detail. The customers served by power out of the Appleton/Canby connection are found primarily in the Minnesota counties of Swift, Big Stone, Lac qui Parle, Pipestone, and

Chippewa, although customers in other Minnesota counties and in a small portion of South Dakota also will benefit from the new line. A map showing the service area is found in Section 3.4 on page 16.

The Applicant estimates that there are approximately 25,000 people who live in the service area, not all of whom are customers of Otter Tail Power Company.

## 5.4 Peak Demand and Annual Electrical Consumption

Minnesota Rules part 7849.0270 requires an applicant for a Certificate of Need to provide information about the peak demand and annual electrical consumption within the applicant's service area and system. Because the line proposed here is for local load serving purposes, the Commission exempted the Applicant from providing this information for its entire system and authorized the Applicant to provide the data only for the service area. Also, because there is a small number of customers in the service area, the Commission agreed with the Applicant that it was not necessary to provide the data for the various consumer classes served. Finally, the Commission also agreed that the average system weekday load factor by month was not information that was required in this case.

### 5.4.1 Peak Demand

The peak demand for the service area for the previous fourteen years is shown by month in Table 3 below:

**Table 3. Historical Demand MW per Month**

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1992 | 54 | 52.1 | 47.7 | 45.7 | 43.5 | 43.1 | 45.9 | 52.2 | 43.4 | 54 | 53.2 | 61 |
| 1993 | 57.9 | 54.7 | 52.2 | 52.5 | 42.3 | 44.9 | 46.8 | 60.4 | 47.7 | 52.3 | 52.8 | 56.3 |
| 1994 | 56.3 | 55.8 | 48.5 | 48.4 | 44.8 | 57 | 55.1 | 54.5 | 46.1 | 57.7 | 55 | 53 |
| 1995 | 52.4 | 56.6 | 58.2 | 51.3 | 46.2 | 62.7 | 50.3 | 60.1 | 48.1 | 59.8 | 61.2 | 58.6 |
| 1996 | 61.8 | 61 | 63.1 | 57 | 49.1 | 67.5 | 62.3 | 64.9 | 67 | 58.5 | 63.9 | 64.4 |
| 1997 | 63.9 | 61 | 59.7 | 56 | 51.3 | 64.3 | 69.6 | 61 | 51.5 | 64.3 | 61.1 | 57.6 |
| 1998 | 58.6 | 59.3 | 61.2 | 50.4 | 58.2 | 62.6 | 74.3 | 74.6 | 57.5 | 55.4 | 58.6 | 62 |
| 1999 | 62.8 | 62.8 | 59.1 | 52.3 | 49.3 | 67.4 | 77.3 | 76 | 52.3 | 58.6 | 54.7 | 59.7 |
| 2000 | 60.6 | 58.1 | 54.6 | 52.3 | 49.7 | 61.5 | 70.2 | 75.9 | 51.4 | 56.6 | 60.2 | 66 |
| 2001 | 63 | 62.6 | 58.9 | 63.7 | 55.2 | 65.5 | 70.6 | 75.5 | 56.5 | 58.4 | 57.4 | 60.9 |
| 2002 | 55.4 | 63.4 | 63.2 | 56.4 | 56.1 | 68.6 | 74.3 | 66.9 | 67.3 | 68.5 | 66.1 | 66.8 |
| 2003 | 66.9 | 64 | 62.8 | 52.4 | 45.7 | 58.5 | 68.7 | 73.4 | 56.1 | 56.3 | 58.5 | 64.3 |
| 2004 | 62.6 | 70.2 | 56.1 | 49.1 | 46.5 | 57.2 | 73.7 | 61.1 | 59.9 | 63.7 | 64.7 | 65.5 |
| 2005 | 64.6 | 63.1 | 58.2 | 49.9 | 50 | 60.1 | 69.1 | 72.4 | 53.1 | 61.1 | 63.4 | 68.5 |
| Forecast and Historical | | | | | | | | | | | | |
| 2006 | 66 | 66.2 | 63.3 | 58.6 | 55.1 | 71.3 | 76.3 | 77.7 | 60.2 | 65 | 65.4 | 67.9 |

### 5.4.2 Annual Electrical Consumption

The annual electrical consumption (in megawatt hours) for the service area for the previous fourteen years is shown by month in Table 4 below.

**Table 4. Historical Consumption**

**Historical Consumption (MWh) for area**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
|---|---|---|---|---|---|---|---|---|---|
| 1992 | 29,767 | 25,827 | 25,309 | 22,798 | 21,076 | 20,536 | 22,084 | 25,781 | 21,596 |
| 1993 | 31,910 | 26,676 | 27,242 | 23,663 | 21,464 | 21,028 | 22,780 | 24,906 | 21,126 |
| 1994 | 34,676 | 29,399 | 26,519 | 23,709 | 22,344 | 23,723 | 26,810 | 26,757 | 23,164 |
| 1995 | 30,681 | 27,885 | 28,584 | 26,011 | 23,540 | 26,405 | 25,090 | 29,566 | 23,616 |
| 1996 | 39,486 | 34,698 | 35,270 | 30,146 | 25,610 | 27,116 | 29,735 | 31,452 | 26,273 |
| 1997 | 39,253 | 32,147 | 32,390 | 29,484 | 27,491 | 29,905 | 32,047 | 30,087 | 26,808 |
| 1998 | 35,754 | 29,214 | 32,210 | 25,869 | 26,550 | 27,675 | 35,072 | 33,804 | 29,235 |
| 1999 | 37,200 | 30,237 | 30,971 | 26,734 | 26,294 | 30,214 | 36,911 | 32,997 | 25,741 |
| 2000 | 36,113 | 31,146 | 29,248 | 26,826 | 26,237 | 28,604 | 34,821 | 37,266 | 26,990 |
| 2001 | 36,341 | 34,416 | 33,579 | 29,978 | 25,762 | 28,288 | 35,809 | 35,609 | 25,147 |
| 2002 | 37,466 | 30,594 | 35,209 | 29,331 | 28,386 | 31,364 | 38,532 | 33,892 | 29,869 |
| 2003 | 38,137 | 33,430 | 32,303 | 26,637 | 24,684 | 26,802 | 34,577 | 34,761 | 26,411 |
| 2004 | 38,022 | 34,116 | 31,048 | 25,319 | 25,203 | 25,467 | 32,126 | 29,347 | 26,480 |
| 2005 | 39,212 | 31,949 | 32,963 | 26,373 | 26,124 | 29,388 | 36,509 | 31,098 | 26,064 |

**Forecast and historical consumption (MWh) for area**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2006 | 35,545 | 34,994 | 33,803 | 26,462 | 27,740 | 27,514 | *32,766* | *34,417* | *26,537* |

## 5.5 Forecasts

Minnesota Rules part 7849.0270 requires an applicant to explain the manner in which the applicant has conducted forecasting of its future energy needs. Otter Tail Power Company provided all this information system-wide in the Big Stone matter. PUC Docket No. CN-05-619. In this case, the Commission granted an exemption from the requirement to address the company's entire system and to focus instead on the service area affected. However, the forecast methodology is essentially the same in this case as it was for the entire system in the Big Stone matter. Therefore, much of the explanation of the methodology here and in Appendix D is taken from the discussion in the Big Stone Transmission Line Certificate of Need Application. The results of the forecast completed for this matter, on the other hand, are only for the area to be served by the new line.

### 5.5.1 Methodology

In developing a long-range load forecast for the service area in this case, the company analyzed multiple scenarios and assumptions regarding, among other things, weather, demographic trends and macroeconomics. The area long range forecast was completed with a methodology similar to the econometric forecast model used in Otter Tail Power Company's most recent integrated resource plan filing and in accordance with the Commission's order approving the company's Resource Plan in Docket No. EO17/RP 02-1168.

Econometric energy models of energy sales were developed for the load center, using historical data on monthly sales, economic activity, and weather conditions. Monthly sales forecasting models were estimated as a function of these explanatory variables, plus month-specific variables to capture any seasonal patterns that are not related to the other explanatory variables. To forecast load center peak demand, an econometric model was developed that explains monthly system peak demands as a function of weather, economic conditions, the number of households in the load center, and month-specific variables.

The specifics of the models of the company's forecast required under Minnesota Rules part 7849.0270 are included in Appendix D. Because some of the information in Appendix D constitutes trade secret data and is confidential, and nonpublic, Appendix D attached has the trade secret data removed, and a separate Appendix D containing the trade secret data has been provided to the Public Utilities Commission and the Department of Commerce.

### 5.5.2 Demand Forecast Results

Table 5 shows the company's results of its forecasting of peak demand in the service area through the year 2021.

**Table 5. Forecast Demand (MW per Month)**

| | Jan. | Feb. | March | April | May | June | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 66.9 | 67.1 | 64.2 | 59.6 | 56 | 72.8 | 77.8 | 79.2 | 61.1 | 66 | 66.4 | 68.8 |
| 2008 | 67.8 | 68.1 | 65.1 | 60.5 | 56.9 | 47.3 | 79.3 | 80.7 | 62 | 66.9 | 67.3 | 69.7 |
| 2009 | 68.7 | 69 | 66 | 61.4 | 57.9 | 75.8 | 80.8 | 82.2 | 62.9 | 67.8 | 68.2 | 70.7 |
| 2010 | 69.6 | 69.9 | 66.9 | 62.3 | 58.8 | 77.4 | 82.3 | 83.8 | 63.9 | 68.8 | 69.2 | 71.6 |
| 2011 | 70.5 | 10.8 | 67.9 | 63.2 | 59.7 | 78.9 | 83.9 | 85.3 | 64.8 | 69.7 | 70.1 | 72.6 |
| 2012 | 71.5 | 71.8 | 68.8 | 64.2 | 60.7 | 80.5 | 85.5 | 87 | 65.8 | 70.7 | 71.1 | 73.5 |
| 2013 | 72.5 | 72.7 | 69.8 | 65.2 | 61.7 | 82.1 | 87.1 | 88.6 | 66.8 | 71.7 | 72.1 | 74.5 |
| 2014 | 73.4 | 73.7 | 70.7 | 66.1 | 62.6 | 83.7 | 88.7 | 90.2 | 67.7 | 78.7 | 73.1 | 75.5 |
| 2015 | 74.4 | 74.7 | 71.7 | 67.1 | 63.6 | 85.4 | 90.4 | 91.9 | 68.7 | 73.7 | 74.1 | 76.5 |
| 2016 | 75.3 | 75.6 | 72.7 | 68.1 | 64.6 | 87 | 92.1 | 93.5 | 69.7 | 74.7 | 75.1 | 77.5 |
| 2017 | 76.3 | 76.6 | 73.6 | 69 | 65.5 | 88.7 | 93.7 | 95.2 | 70.7 | 75.6 | 76 | 78.5 |
| 2018 | 77.2 | 77.5 | 74.5 | 70 | 66.5 | 90.3 | 95.4 | 96.9 | 71.6 | 76.6 | 77 | 79.4 |
| 2019 | 78.1 | 78.4 | 75.4 | 70.9 | 67.4 | 92 | 97 | 98.5 | 72.5 | 77.5 | 77.9 | 80.3 |
| 2020 | 79 | 79.3 | 76.4 | 71.8 | 68.3 | 93.7 | 98.7 | 100.2 | 73.5 | 78.5 | 78.9 | 81.3 |
| 2021 | 80 | 80.2 | 77.3 | 72.7 | 69.2 | 95.3 | 100.4 | 101.9 | 74.4 | 79.4 | 79.8 | 82.2 |

### 5.5.3 Consumption Forecast Results.

Table 6 shows the company's results of its forecasting of energy consumption in the service area through the year 2021.

**Table 6. Forecasted Consumption**

| Forecast consumption (MWh) for area | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2007 | 39,082 | 30,461 | 35,645 | 28,199 | 28,713 | 28,417 | 34,296 | 35,296 | 27,317 | 35,681 | 35,399 | 40,689 |
| 2008 | 39,735 | 32,307 | 36,499 | 28,749 | 29,287 | 28,971 | 34,880 | 35,894 | 27,754 | 36,257 | 35,972 | 41,311 |
| 2009 | 40,333 | 31,658 | 37,019 | 29,149 | 29,685 | 29,358 | 35,341 | 36,357 | 28,106 | 36,713 | 36,416 | 41,813 |
| 2010 | 40,818 | 32,033 | 37,453 | 29,487 | 30,026 | 29,692 | 35,739 | 36,763 | 28,418 | 37,116 | 36,813 | 42,267 |
| 2011 | 41,258 | 32,377 | 37,853 | 29,801 | 30,344 | 30,005 | 36,114 | 37,148 | 28,714 | 37,502 | 37,195 | 42,704 |
| 2012 | 41,684 | 33,878 | 38,241 | 30,106 | 30,654 | 30,311 | 36,482 | 37,526 | 29,006 | 37,882 | 37,572 | 43,136 |
| 2013 | 42,105 | 33,040 | 38,628 | 30,410 | 30,963 | 30,616 | 36,849 | 37,903 | 29,297 | 38,263 | 37,949 | 43,569 |
| 2014 | 42,528 | 33,372 | 39,015 | 30,715 | 31,273 | 30,923 | 37,218 | 38,283 | 29,591 | 38,646 | 38,329 | 44,005 |
| 2015 | 42,954 | 33,706 | 39,406 | 31,022 | 31,587 | 31,233 | 37,591 | 38,666 | 29,887 | 39,033 | 38,713 | 44,445 |
| 2016 | 43,385 | 35,260 | 39,801 | 31,333 | 31,903 | 31,546 | 37,967 | 39,053 | 30,186 | 39,424 | 39,100 | 44,890 |
| 2017 | 43,819 | 34,385 | 40,199 | 31,647 | 32,222 | 31,862 | 38,348 | 39,445 | 30,489 | 39,819 | 39,492 | 45,340 |
| 2018 | 44,258 | 34,730 | 40,602 | 31,964 | 32,545 | 32,181 | 38,732 | 39,840 | 30,794 | 40,218 | 39,887 | 45,794 |
| 2019 | 44,702 | 35,078 | 41,009 | 32,285 | 32,872 | 32,504 | 39,120 | 40,240 | 31,103 | 40,621 | 40,288 | 46,254 |
| 2020 | 45,151 | 36,696 | 41,421 | 32,609 | 33,202 | 32,830 | 39,513 | 40,644 | 31,415 | 41,029 | 40,692 | 46,718 |
| 2021 | 45,605 | 35,786 | 41,837 | 32,936 | 33,535 | 33,160 | 39,910 | 41,052 | 31,731 | 41,441 | 41,101 | 47,187 |

### 5.5.4 System Capacity

Minnesota Rules part 7849.0280 provides that an applicant for a Certificate of Need must provide information about the ability of the existing system to meet the demand for energy predicted to occur in upcoming years. Otter Tail Power Company applied for an exemption from most of the requirements in this rule because they are applicable to proposed generating plants, not transmission lines. The Commission granted the exemption. The only two provisions in the rule that the Applicant must respond to are subpart A (relating to planning programs) and subpart H (relating to net demand and net capability), and that discussion is contained below. The Applicant discussed both of these subparts and other subparts in the rule on a system-wide basis in Appendix K of the Certificate of Need Application for the Big Stone Transmission Project. That information is available for readers who prefer a more detailed discussion of the Otter Tail Power Company system.

### 5.5.5 Transmission Planning

Otter Tail Power Company was one of a number of Minnesota utilities that prepared the 2005 Biennial Transmission Projects Report, which was approved by the Public Utilities Commission on June 1, 2006. PUC Docket No. E-999/TL-05-1739. In Section 4 of that Report, the Minnesota utilities described the transmission planning process implemented

by the utilities. The utilities explained how they run computer models under various potential operating conditions, including the loss of one or more facilities, to determine what the effect of certain operating conditions and contingencies will have on the system.

Also, in section 3 of the 2005 Biennial Report, the utilities described the various organizations that have a role in transmission planning and the various standards that utilities must meet in maintaining a reliable transmission system. Such organizations include the Min-continent Area Power Pool ("MAPP"), the Midwest Independent Transmission System Operator ("MISO"), and the Midwest Reliability Organization ("MRO").

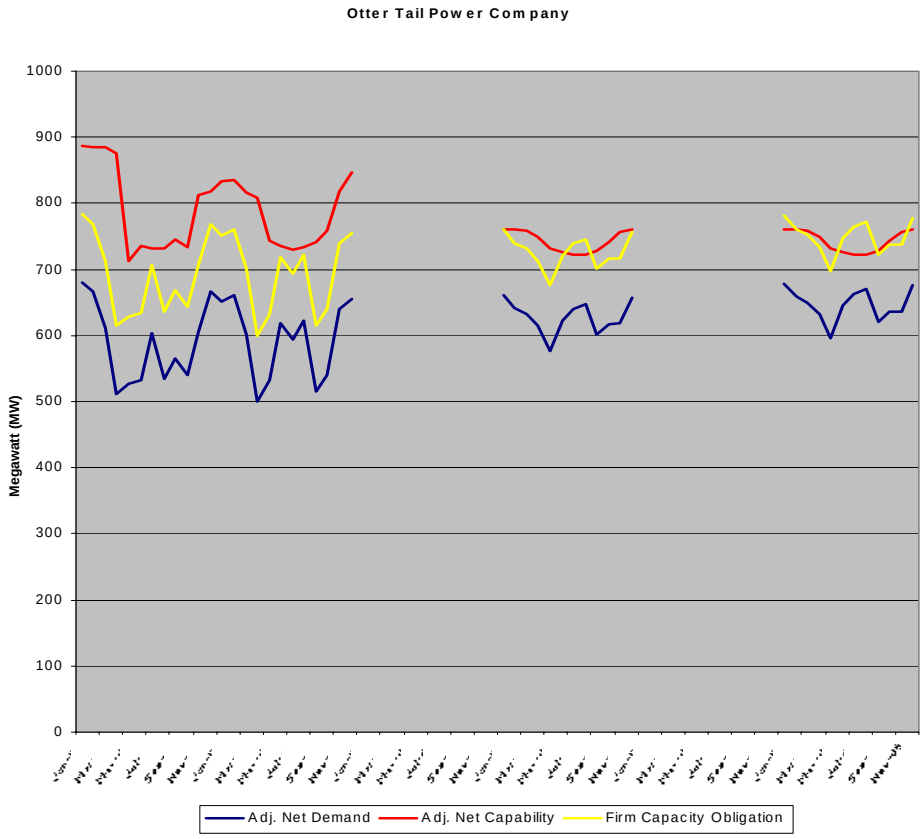
In this case, Otter Tail Power Company determined that the transformer at the Canby substation would overload during extreme summer peak situations and that the load in the area was continuing to grow with time. The Applicant also knew that the Appleton area could experience unacceptably low voltages during a critical contingency such as a loss of the Ortonville 115 kV line. The Applicant conducted computer modeling to determine what the impact on the system would be under certain operating conditions and certain contingencies if various improvements were made in the area. The model showed that the upgrade of the existing line from 41.6 kV to 115 kV would provide adequate and reliable service in the area for at least twenty years, given anticipated growth levels.

### 5.5.6 Net Demand and Net Capability

The proposed 115 kV line will greatly increase the capacity of the Appleton/Canby line to serve the area. Presently, the 41.6 kV line can operate safely at approximately 70 MW. Above 70 MW, the transformer at Canby begins to overheat if that amount of power is served through the Canby substation. With upgrade of the line to 115 kV capacity, the system can operate safely at over 100 MW of demand, even with the loss of another source. That is enough capacity to serve the area through the year 2021 under projected increases.

The Applicant has determined the present and future adjusted net demand and net capability of its system is as displayed in Table 7 below.

**Table 7. Net Demand and Capability**




## 5.6 Increased Efficiency

As explained in section 4.6, line losses are proportional to the square of the current – the lower the current the lower the line losses. Increasing the voltage on the Appleton/Canby line from 41.6 kV to 115 kV will allow the company to reduce the current on the line to carry the same amount of power, so the efficiency of this line will increase.

Line losses are calculated to be 0.7 MW less with the line operated at 115 kV as opposed to 41.6 kV under summer peak conditions. This translates into actual dollars saved in generation costs and in energy consumption charges. The company's best estimate is that these reduced line losses will result in a present value savings of capacity of $949,525 and a present value savings of energy of $814,289, over the life of the Project.

## 5.7 Energy Conservation and Load Management Programs

Otter Tail Power Company implements both an energy conservation program and demand side management programs throughout its entire Minnesota service area. Both of these programs are described in greater detail in the company's 2005 Resource Plan (PUC Docket No. EO17/RP-05-968), and in the Big Stone Transmission Line Project Certificate of Need Application, (PUC Docket No. CN-05-619). Appendix E is a copy of material regarding the company's energy conservation programs taken from the Big Stone Application.

Over the past six years, the company has spent nearly $2 million per year on its Conservation Improvement Program ("CIP") and over the past fifteen years has spent more than $20 million implementing programs to conserve energy. These programs have resulted in a savings of more than 150 million kilowatt hours of energy over the past fifteen years and recently the company is experiencing over 10 million KWH of savings per year through implementation of various efforts to conserve and control demand.

The company does not have the capability to determine what portion of the energy savings has occurred in the service area to be benefited by this proposed new 115 kV line. It is fair to assume that some percentage of that savings, probably proportional to the number of customers in this area or to the energy consumed, has been saved in the area.

Demand side management programs are intended to minimize the peak load required at any given moment by reducing or eliminating the load for certain customers at certain times. For example, some residential customers have agreed to have their air conditioners turned off on hot summer afternoons for short periods of time. The company has recently begun to focus its efforts to mange summer peak demand. Recently, rate modifications were approved and plans are underway to include cycling cooling load in the summer. For the last several years, the company has recognized a reduction of approximately 2.0 to 2.5 MW of peak demand through its residential demand program. This may increase slightly as the company focuses on summer reductions throughout Minnesota. Again, some savings is obviously attributed to customers in the Appleton/Canby service area but it is difficult to determine what portion of the savings occurs there.

The company intends to carry forward both its CIP efforts and its demand side management program.

The kinds of loads that are seen in the Appleton/Canby area that are causing concerns for low voltage and equipment overloads reflect the energy and demand savings that have been realized by the company's past efforts to implement conservation methods and control demand. It is not reasonable to expect, however, that additional conservation or demand control programs would eliminate the need for additional transmission capacity in the area, particularly in contingency situations when a line or piece of equipment is out of service. It is possible, however, that more conservation will extend the period of time

that this new line will be capable of handling the increasing demand for power in the area.

## 5.8 Effect of Promotional Practices

The growth in demand in the Appleton/Canby service area is a result of the growth in the number of customers and in the energy that each customer is consuming. The Applicant has not engaged in any promotional practices to encourage the use of more power. Just the opposite, as described in section 5.8, the Applicant has spent significant sums of money promoting conservation and demand side management.

## 5.9 Delay of the Project

Under present loading conditions, the transformer at the Canby substation becomes overloaded during extreme summer peak situations. During the hot weather experienced throughout Minnesota in July of 2006, the Dawson load, normally served from Canby, needed to be served from Appleton in order to avoid overloading the Canby 115/41.6 kV transformer. This was despite the addition of cooling fans in 2000 to increase the thermal capacity of the transformer.

Also, under present loading conditions, the area around Appleton experiences unacceptably low voltages during critical contingencies of the 115 kV line that extends from Ortonville to Appleton.

As load continues to grow in the area, the number of times the transformer overloads will increase, and the duration of the event will become longer. Likewise, the voltage depression in the Appleton area will continue to worsen during the loss of the 115 kV line from Ortonville. Serving the Dawson load from Appleton during peak conditions will only exacerbate already low post-contingent voltage levels in the Appleton area. Furthermore, other equipment around the area at other substations may also overload. Overloading transformers and other equipment jeopardizes the reliability of the system and threatens a loss of power in the area. Any delay in the Project will increase the risks to customers served out of the Appleton and Canby substations.

The longer the delay in completing the Project, the more threatening the risks to customers in the area. By 2009, with just a one year delay, the present 41.6 kV system cannot adequately provide reliable service and the Canby transformer will overload during summer peak conditions. A two year or three year delay increases the risks to the customers and magnifies the chances that a contingency might occur. As described in section 6.5 regarding the no-build option, something has to be done and quickly to ensure reliable service.

# 6 ALTERNATIVES TO THE PROJECT

## 6.1 Analysis of Alternatives

In any Certificate of Need proceeding on a proposed transmission line project, the applicant is required to consider various alternatives to the proposed project. Minnesota Statutes § 216B.243, subd. 3(6) provides that in assessing need, the PUC will evaluate "possible alternatives for satisfying the energy demand or transmission needs." The Commission has also provided in its rules that an applicant for a Certificate of Need must discuss in the application the possibility of a number of alternatives. Minnesota Rules part 7849.0260 states:

Each application for a proposed LHVTL must include:

A. a discussion of the availability of alternatives to the facility, including but not limited to:

1. new generation of various technologies, sized, and fuel types;

2. upgrading of existing transmission lines or existing generating facilities;

3. transmission lines with different design voltages or with different numbers, sizes, and types of conductors;

4. transmission lines with different terminals or substations;

5. double circuiting of existing transmission lines;

6. if the proposed facility is for DC (AC) transmission, an AC (DC) transmission line;

7. if the proposed facility is for overhead (underground) transmission, an underground (overhead) transmission line; and

8. any reasonable combinations of the alternatives listed in subitems (1) to (7).

Minnesota Rules part 7849.0340 also requires an applicant to consider the option of not building the proposed facility.

## 6.2 Transmission Alternatives

### 6.2.1 System Alternatives

The Applicant considered the possibility of building a different transmission line between other endpoints, but this option was promptly rejected because constructing an entirely

new right-of-way when an existing line was an acceptable solution to the problem seemed excessive. A new line, with new right-of-way, would undoubtedly add to the expense and would result in proliferation of transmission lines when such was not necessary. Further, the other transmission alternatives would have meant adding additional crossings to environmentally sensitive areas such as wetlands surrounding the Minnesota River.

### 6.2.2 Design Options

The Applicant considered the possibility of installing a line of a different voltage than 115 kilovolts. However, constructing this line at a voltage level other than 115 kV would add significantly to the cost of the Project. The two endpoints of the proposed Project, Appleton and Canby, are served by existing 115 kV lines today. To build the Project at a voltage level other than 115 kV would require a transformer at each end to step the voltage to the proper level. The addition of these transformers alone would add approximately $1,300,000 for each 115/69 kV transformer and 1,725,000 for each 230/115 kV transformer.

From a performance perspective, constructing the Project at a voltage level lower than 115 kV would result in a decreased level of capacity. And constructing the Project at a voltage level higher than 115 kV would not result in increased capacity because the capacity of a higher voltage line would be limited to the capacity of the 115 kV system that would supply power to it.

The Applicant also considered using a different conductor than the one intended. This would require replacement of the existing conductor, which is adequate for carrying a 115 kV load. This would add unnecessarily to the cost of the Project.

### 6.2.3 Upgrading

The PUC requires an applicant to consider the possibility of upgrading an existing transmission line when seeking a Certificate of Need. That is essentially what the Applicant is doing in this case – upgrading the existing line between Appleton and Canby from 41.6 kV to 115 kV.

### 6.2.4 Double Circuiting

Double circuiting is the construction of two separate circuits on the same structures. Double circuiting is employed, for example, in situations where the two circuits serve different functions or where high capacity (but not redundancy) is required. Double circuiting is not acceptable in situations where failure of both circuits would jeopardize service.

Approximately one third of the existing line already contains two circuits. One circuit is the existing 41.6 kV system and the other is a 12.5 kV distribution system. The 12.5 kV system primarily comes out of the Louisburg Junction substation and serves power north to the Minnesota River and south from the substation approximately seven miles.

Adding additional circuits to this line is not appropriate in this case. This line is designed to serve a local load and a single 115 kV circuit is adequate to provide the power required. There is nothing that would be gained by installing a second circuit on the same structures.

### 6.2.5 Direct Current Alternative

The PUC rules require an applicant for a Certificate of Need for a transmission line conducting alternating current (AC) to consider the possibility of constructing a direct current (DC) transmission line. DC lines are normally used for transmitting large amounts of electricity over long distances. There are only two DC lines in existence in Minnesota, and all certificates of need and route permits issued in the recent past are for AC lines.

A DC line is not a realistic option in this situation. A line intended for local load serving purposes like this one must be an AC line, to allow the utility to readily tap the line to serve the customers. A DC line would require conversion systems to convert the AC electricity first to DC, and then another converter to convert back to useable AC. Such converters would add dramatically to the cost and would serve no purpose.

### 6.2.6 Undergrounding

Undergrounding is an option that is seldom used for transmission lines. One major reason for rejecting undergrounding is the expense. The cost range depends on such factors as type of cable required, existing underground obstructions like rocks, the thermal capability of the soil, and the number of river crossings. A 115 kV underground transmission line will likely cost ten times as much as an overhead line constructed on wood structures spaced 300 feet apart. In addition, there are other costs incurred throughout the life of an underground line, such as increased line losses, that add to this cost differential.

A description of undergrounding techniques, including the types of cable utilized, is provided in other applications submitted to the PUC. See Application to the Minnesota Public Utilities Commission for Certificates of Need for Four High Voltage Transmission Line Projects in Southwestern Minnesota, Xcel Energy, December 26, 2001, at page 61, PUC Docket No. E-002/CN-01-1958, and Certificate of Need Application for Transmission Lines in Western Minnesota, Big Stone Partners, December 9, 2005, at page 89, PUC Docket No. CN-05-619.

Because of the significantly greater expense associated with underground transmission construction, the use of underground technology is limited to locations where the impacts of overhead construction are completely unacceptable or where physical circumstances allow for no other option. Examples include congested downtown centers where there is no space available between city streets and adjacent buildings for adequate clearance, or airport approaches where an overhead transmission line cannot be constructed in compliance with FAA air space restrictions. The company has not found any places

along the existing transmission line that would present the circumstances that the lines be placed underground.

While underground lines avoid any visual impact and minimize surface impacts after construction, there are environmental consequences with an underground line. The predominant environmental impact from the construction, operation and maintenance of underground transmission lines is the need to obtain and maintain absolutely clear rights-of-way. Overhead transmission lines typically have construction and maintenance activities concentrated around structures and poles, while the areas between structures can be left relatively undisturbed except for the removal of vegetation that could interfere with the conductors. Even during construction activities, a pathway between structures is often all that is necessary to allow conductor stringing to take place. However, with underground transmission construction, even though the right of way is relatively narrow when compared to the right-of-way required for overhead lines, the entire right-of-way needs to be cleared and is utilized for construction activities, which must occur at every point along the right-of-way. The situation is somewhat comparable to that for pipeline construction.

Underground lines also present challenging service issues. Overhead lines are subject to more frequent short duration outages, which are usually restored by automatic reclosers. Underground cables may have fewer incidents, but the outages will be longer in duration because underground cables are not subject to reclosing operations. This is particularly difficult when the line is partially overhead and partially underground because the overhead portion is subject to normal lightning strikes but reclosing is prevented due to the underground portion of the lines.

Due to the reasons listed above (such as costs, maintenance, land use impacts, and no congested areas), underground lines are not feasible or appropriate in this situation.

The Applicant evaluated the possibility of constructing the line underground where it crosses the Minnesota River on the north end. The Applicant found that to tunnel under the Minnesota River would cost approximately $1 million alone, raising construction costs by more than 50% when the entire cost of replacing the structures is $1.7 million. The company has worked closely with the organizations and agencies that have interest and control in this area and have jointly determined that leaving the line overhead will not have a significant detrimental effect on the area.

## 6.3 Generation Alternatives

The PUC rules require an applicant who seeks a Certificate of Need for a new transmission line to consider the possibility of building additional generation instead. Minnesota Rules part 7849.0260(B)(1). In addition, Minnesota Statutes Section 216B.243, subdivision 3a, requires an applicant seeking a Certificate of Need for a transmission line that will transmit electric power from nonrenewable generation sources to demonstrate to the Commission’s satisfaction that it has explored the possibility of generating power by means of renewable energy sources. The Applicant has considered the possibility of installing a small generator to provide additional power in the area.

### 6.3.1 Distributed Generation

Distributed generation is generally considered to be small generation sources, usually less than 10 megawatts, located close to the ultimate users. However, in some cases generators larger than 10 MW are considered to be distributed generation.

Based on load flow steady state analysis, about 10 megawatts of generation would be required somewhere between Appleton and Ortonville and approximately 7 megawatts of generation would be required in the Canby area to meet the increasing demand for power in the area. In addition to these generators, an additional 6 megavars of capacitance would be required in the Appleton to Ortonville area as well as 4.5 megavars of capacitance in the Canby area to alleviate low voltage issues.

The fuel source for these small generators could be diesel fuel, propane or natural gas. Natural gas is unlikely, because there is no readily available natural gas supply in the area, and installing a pipeline for such a small generator would not be cost effective. The most likely fuel would be diesel, and several diesel generators, which are typically in the 1.5 to 2 MW range, would be required to generate the 17 MW that are required.

Diesel fired generators like those under consideration here are generally utilized on a standby basis, and fired up when conditions, such as a contingency situation when a line or transformer is taken out of service, require operation of the generator. Diesel generators are not generally operated continually. That provides two concerns in this situation. First, if a contingency arises, like a storm event, there would be a period of time when power was not available while the plant was placed into operation. Second, as the demand for power continues to grow in the Appleton/Canby area, the time these generators were in operation would continue to expand, making for expensive generation.

New diesel generators are estimated to cost close to $10 million, far in excess to what the upgrade of the transmission line is estimated to cost.

### 6.3.2 Renewable Generation Source

There is the potential to install wind turbines in the Appleton/Canby area. While this area does not have the best winds in western and southwestern Minnesota, and is not located on Buffalo Ridge, the winds in this area are of a magnitude and duration that wind development is likely to occur. Wind turbines to provide 17 MW of power would cost far more than the $2.6 million this Project will cost. Also, upgrading the transmission system in the area to 115 kV should actually improve the ability of wind power to enter the transmission grid, although specific studies would be required before the impact such an addition would have on the grid could be determined.

## 6.4 Conservation

As explained in section 5.7, the Applicant has obtained significant energy savings from various conservation programs that it has implemented. While additional savings will be realized from continuation of these efforts, conservation alone will not suffice to address the significant reliability issue that exists in the area. Demand is continuing to grow

regardless of the company's conservation efforts, and any of a number of contingencies could jeopardize service to customers in the area. Although conservation is not a replacement for upgrading the line, any improvements seen in conserving energy will add to the security of the system and extend the time that the 115 kV line will be adequate to serve the area.

## 6.5 No-build Alternative

The Public Utilities Commission requires an applicant for a Certificate of Need to address the potential consequences of not building anything, called the no-build alternative. Minnesota Rules part 7849.0340. The no-build alternative is usually also considered in the environmental review conducted by the Department of Commerce.

In this case, the no-build alternative means that the Applicant continues to operate the 41.6 kV line between Appleton and Canby. There would still be a transmission line in essentially the same place as the new line is intended to go. The structures would be slightly shorter in some places than with the new line, but there would likely be more of them. Visually and environmentally, there would not be much difference between the existing line and the new line.

On the other hand, electrically there would be significant ramifications of not doing anything. Currently, voltage support is a concern in the project area for contingencies during summer peak conditions when the load on the 41.6 kV line is at its maximum. As load continues to grow, voltage support concerns, as well as loading issues, will occur more frequently, including under system intact conditions. Eventually, a single outage could result in a localized voltage collapse or damage to equipment. If this were to occur, it would take several hours to restore electric service to customers in the area. Once load was restored, rotating blackouts may be required to insure voltage would not collapse again until the equipment that caused the outage is repaired or replaced and put back into service.

At the present time, there are two issues that are of concern in the project area. First, additional voltage support is required in the Appleton area during an outage involving the 115 kV line running from Ortonville that feeds the Appleton substation. Second, the Canby 115/41.6 transformer is operating very near its thermal rating during peak conditions. Fans were added to the transformer in 2000 in order to increase its capacity. During the hot weather experienced throughout Minnesota in July 2006, and during previous summer loading conditions, Dawson, whose load is normally served from Canby, needed to be served from Appleton in order to avoid overloading the Canby transformer. An outage of the 115 kV line that serves Appleton during this timeframe would have put the transmission system in this area in a precarious situation.

As load continues to grow, voltage support concerns as well as loading issues will occur for system intact conditions. If these inadequacies are not eliminated, a single outage could result in localized voltage collapse or damage to equipment. If this were to occur, it could take several hours or longer to restore electric service to the customers in the project area. Once the load was restored, rotating blackouts might be required to insure

voltage would not collapse again until the equipment that caused the outage was repaired or replaced and put back in service.

For a system intact condition and using only the existing transmission and substation system, as is, would not provide adequate power delivery capacity or reliable service by the year 2009. No action with respect to the improvement to the area's electric power delivery systems would place the safety and well-being of the area's residential and commercial customers at risk of being without reliable electric service.

# 7 ALTERNATIVE ROUTES

## 7.1 Alternative Requirement

Under the shorter review process, which is applicable in this case, an applicant for a Route Permit is not required to identify and evaluate an alternative route to the preferred route, as is required for transmission lines above 200 kilovolts. Because the preferred route in this case is an existing route, there is little likelihood that another route would be preferable to the preferred route. However, Minnesota Rules part 4400.2100 requires an applicant to identify any alternative routes that were considered and rejected.

## 7.2 Rejected Route Alternatives

Because the preferred route follows an existing route, there were no readily apparent alternative routes to consider to determine whether they offered any benefits over the preferred route. The Applicant reviewed possible minor changes in the route for the section of line from the Minnesota River to the Appleton substation in order to avoid one particular landowner with an irrigation system on his property. However, the landowner indicated that the line in its current location did not impact his irrigator, and these other route segments were rejected.

The one possibility the Applicant considered was to place the line under the Minnesota River. However, as described in Section 6.2.6, undergrounding the line would add significantly to the cost, no state or federal agencies with jurisdiction over state and federal waters thought such an approach was necessary, and continuation of an existing line over the river in the same location did not interfere with any recreational or wildlife preservation goals.

The Applicant has not received any objections to the proposed route nor any suggestions for alternative route segments on the north end.

# 8 ENGINEERING, DESIGN, CONSTRUCTION, AND RIGHT-OF-WAY ACQUISITION

## 8.1 Transmission Line Engineering and Operation Design

### 8.1.1 Transmission Structure Design and Right-of-Way Requirements

For a description of the structure design and the right-of-way requirements, refer to section 4.1. A schematic of the proposed structures can be found on page 21.

### 8.1.2 Design Options to Accommodate Future Expansion

It is not likely that the proposed transmission line will be upgraded to a higher voltage in the future. However, just the fact that it will have the capability to operate at 115 kV will afford opportunities for future expansion in the area. The line upgrade will result in a looped 115 kV system through the Appleton, Louisburg, and Dawson substations. A looped system is preferable to a lateral system and allows for increased demand through these substations. Removing the Dawson load from the Canby substation transformer allows that transformer to be available for other customers remaining on the 41.6 kV system on the southern end. For further discussion of the benefits of upgrading this line, refer to Section 4.

## 8.2 Identification of Existing Utility and Public Right-of-Way

The existing 41.6 kV line parallels existing road right-of-way for nearly the entire length, all but four miles. Table 8 below summarizes the length of highway right-of-way that is followed. The new line will continue to follow the same highway right-of-way. In addition, the new line along the route preferred by the Applicant will not require any new easements or right-of-way, except for the short connection to the new Canby substation.

**Table 8. Summary of Corridor Sharing Along Route Alignment**

| Total Route Length (miles) | Existing route built to 115kV operated at 41.6kv (miles) | Existing route built to 115kV sharing road corridor (miles) | Existing route built to 115kV non-sharing corridor (miles) | Existing route built to 41.6kV (miles) | Existing route built to 41.6 kV sharing road corridor (miles) | Existing route built to 41.6 kV non-sharing corridor (miles) | Percentage of Total Route Length shared |
|---|---|---|---|---|---|---|---|
| 42 | 19 | 18.25 | 0.75 | 21.5 | 18.25 | 3.25 | 90% |

## 8.3 Right-of-Way Acquisition

### 8.3.1 Transmission Line Property Acquisition Procedures

The company has existing easements for the 41.6 kV line and does not anticipate that any additional property will be required for the line at 115 kilovolts, except perhaps for a short distance near the Canby substation. However, in those places where the poles have to be replaced, primarily on the north section from Dawson to Appleton, the company intends to enter into new easements with these landowners in order to update the language to reflect typical provisions included in today's easements. In the event the Commission should authorize a different route requiring new right-of-way, the Applicant will be required to obtain new easements.

The Applicant has had a right-of-way agent complete a search of the public records of all lands involved in the Project. This search will be verified to develop a title report to determine the legal description of the property, the owner(s) of record of the property, and other information regarding easements, liens, restrictions, encumbrances, and other conditions of record. Once this information has been verified, a ROW agent will contact the property owners or their representative to inform them of the Project and how it may affect their property. The Applicant did notify by mail and invite all landowners of record to the open houses held on June 21, 2006, and June 22, 2006, and the Applicant will notify the landowners again when this Application is filed, so it should not be new information when the ROW agent contacts the landowner.

The Applicant will complete the preliminary survey work and possible soil investigations after the owner has granted permission. As the design of the transmission line nears completion, the survey crews will stake the structure or structure location. The ROW agent will show the landowner where the structure is to be located on the property and will discuss any location concerns.

The ROW agent will evaluate the amount of just compensation for the easement (i.e. property rights). The ROW agent will begin the negotiating process by presenting the required legal documents and maps of the proposed route to the property owner. Once an offer of compensation is presented, the owner will be allowed a reasonable amount of time in which to consider the offer and to present material to the Applicant, that the owner believes is relevant to determining the value of the property.

The ROW agent will work with the landowner to negotiate the terms of a new easement that are acceptable to the landowner and the company. If the company cannot come to terms on a new easement, then the company intends to continue to exercise its rights that it already has from the previous easement. In the event that the Commission should authorize a new route for the line, and the company and the landowner cannot come to agreement on the terms of an easement, then the company would consider exercising its rights of eminent domain under Minnesota Statutes Chapter 117.

### 8.3.2 Substation Property Acquisition Procedures

The Applicant has not entered into negotiations on any parcels for substation expansion or construction. Currently the Applicant believes that the Dawson substation is the only substation that will require additional land. Once the necessary permits are issued, the Applicant will contact the appropriate landowners of the sites to discuss the Project in detail. The Applicant will request surveys and soil investigations to determine whether the site meets the substation criteria and will develop a more site-specific design. Once the design is finalized, the Applicant will obtain land rights for the facilities and will seek to obtain the property through voluntary purchases.

During the substation construction phase, any affected property owners will be advised of construction schedules and needed access to the site. To construct, operate and maintain the proposed substations, all vegetation will be cleared from the substation footprint area, from the substation driveway area and from a buffer area outside the substation fence. Vegetation on the property outside of the substation footprint, driveway, and buffer will be left undisturbed, except where it must be impacted to allow for transmission line access to the substation.

## 8.4 Construction Procedures

### 8.4.1 Transmission Line.

Once access to the land is granted, site preparation begins in coordination with landowners. Preparation includes clearing the ROW of vegetation that would interfere with the safe operation of the transmission line. Any vegetation that will interfere with construction may also be removed.

Additionally, underground utilities are identified in cooperation with local utility companies to minimize conflicts to the existing utilities along the routes. All materials resulting from the clearing operations will either be chipped on site or stacked in the ROW with landowner agreement for their use. If temporary removal or relocation of fences is necessary, installation of temporary or permanent gates would be coordinated with the landowner. The ROW agent also works with the landowners for early harvest of crops, where possible. During the construction process, the Applicant may ask the property owner to remove or relocate equipment and livestock from the ROW.

Transmission line 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. For example, if vehicle or installation equipment cannot safely access or perform construction operations properly near the structure, minor grading of the immediate terrain may be performed.

The Applicant will employ standard construction and mitigation practices that were developed from experience with past projects as well as industry-specific best management practices (“BMPs”). BMPs address ROW clearance, erecting transmission line structures and stringing transmission lines. BMPs for each specific project are based on the proposed schedules for activities, prohibitions, maintenance guidelines, inspection

procedures and other practices. In some cases these activities, such as schedules, are modified to incorporate BMP construction that will assist in minimizing impacts for sensitive environments. The Applicant does not anticipate using contractors on this line, but if there is a need for contractors they will be advised of these BMP requirements.

The Applicant will begin installing new structures by first removing existing structures closest to the location of the new structures. The structures are installed directly in the ground, by augering or excavating a hole typically 7 to 10 feet deep and 2 to 3 feet in diameter for each pole. Any excess soil from the excavation will be offered to the landowner or removed from the site.

The new structures will then be set and the holes back-filled with the excavated material, native soil, or crushed rock. In poor soil conditions, a galvanized steel culvert is sometimes installed vertically with the structure set inside. The Applicant does not expect to use concrete foundations, but if it becomes required, the size of the hole for concrete foundations depends largely on soil type. Based on the known soil types in western Minnesota, it is anticipated that the average structure depth would be approximately 8.5 feet deep. Drilled pier foundations may vary from 4 to 8 feet in diameter. Concrete trucks are normally used to bring the concrete in from a local concrete batch plant.

After a number of new structures has been erected, the Applicant will begin to install the new static wire by establishing stringing setup areas within the ROW. These stringing setup areas are usually located every two miles along a project route and occupy approximately 15,000 square feet of land. Conductor stringing operations 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 structures are installed, as needed, over existing distribution or communication lines, streets, roads, highways, railways or other obstructions after any necessary notifications are made or permits obtained. This ensures that conductors will not obstruct traffic or contact existing energized conductors or other cables. In addition, the conductors are protected from damage.

During construction, it is sometimes necessary to temporarily remove or relocate fences and to install temporary or permanent gates. The right-of-way agent coordinates with the landowners for early harvest of crops where possible. Equipment and livestock may be removed or relocated from the right-of-way during the construction process.

One particular area requiring attention during construction is the crossing of rivers and streams and wetlands. The Applicant does not anticipate that any structures will be installed in any waters but the Minnesota River and the Pomme de Terre River will have to be crossed. The Applicant intends to place structures in generally the same location along the road right-of-way to cross the Minnesota River. The Applicant intends to span the Pomme de Terre River. In addition, the Applicant will not allow construction equipment to be driven across waterways except under special circumstances and only after discussion with the appropriate resource agency. Where waterways must be crossed to pull in the new conductors and shield wires, workers may walk across, use boats, or

drive equipment across ice in the winter. In areas where construction occurs close to waterways, BMPs help prevent soil erosion and ensure that equipment fueling and lubricating occur at a distance from waterways.

### 8.4.2 Substation Construction Procedures

Once the final design is complete and necessary property is acquired, construction will begin. A detailed construction schedule will be developed based upon availability of crews, outage restrictions for any transmission lines that may be affected, weather conditions, spring load restrictions on roads and any restrictions placed on certain areas for minimizing permanent impacts from construction.

Substation upgrades involve replacing existing equipment with new equipment. All construction work occurs within the existing substation property unless expansion of the site is necessary.

Construction of a new facility or upgrade/addition to an existing facility begins with site preparation work, which involves grading and leveling the site with heavy equipment to support electrical equipment and the control house. This may or may not include replacement of site soils depending on existing soil conditions found and those identified in the Soil Exploration Report. Topsoil will be removed, stockpiled and re-spread onsite. Any excess soil will be offered to the landowner or removed from the site. Once the site is graded, a perimeter fence, typically chain link, is installed to secure the site. All substation equipment will be contained within the fenced area. Concrete foundations are placed throughout the substation pad to support the substation equipment. A control house may be installed to house protective relaying and control equipment. Erection of steel structures follows the foundation installation. These structures are built using rolled I-beams and/or tubular steel materials. Beams are used for mounting electrical conductors, disconnects and equipment. Bare copper conductor is buried around the perimeter of the fence and within the fence to properly ground all of the equipment and provide safety of personnel. Large high-voltage equipment, such as circuit breakers and transformers with associated control cables, are installed following completion of these steel structures. The final step is to properly test and commission each electrical device.

The Applicant will provide erosion control methods to be implemented to minimize runoff during substation construction. A Storm Water Pollution Prevention Plan ("SWPPP") will be implemented in compliance with the NPDES and if necessary, a Spill Prevention, Control and Countermeasure ("SPCC") plan will be developed or updated, as applicable.

Substations will be upgraded in compliance with the applicable requirements of Rural Utilities Service, National Electrical Safety Code, Occupational Safety and Health Act and local regulations. Contractors will be committed to safe working practices. Substations will be reviewed for local conditions and will include provisions in design beyond the minimum provisions for safety established in the various regulatory codes, where warranted. Substation designs will allow future maintenance to be accomplished

with a minimum impact on substation operation and allow adequate clearance to work safely.

## 8.5 Restoration Procedures

### 8.5.1 Transmission Line.

During construction, limited ground disturbance at the structure sites may occur. A main staging area for temporary storage of materials and equipment is established. Typically, a previously-disturbed or developed area is used. Such an area includes sufficient space to lay down material and pre-assemble some structural components or hardware. Other staging areas located along the ROW are limited to the structure site areas, for structure lay down and framing prior to structure installation. Additionally, stringing setup areas are used to store conductors and equipment necessary for stringing operations. Disturbed areas are restored to their original condition to the maximum extent practicable, or as negotiated with the landowner.

Post-construction reclamation activities will include removing and disposing of debris, removing all temporary facilities, including staging and laydown areas, employing appropriate erosion control measures, reseeding areas disturbed by construction activities with vegetation similar to that which was removed with a seed mixture certified as free of noxious or invasive weeds and restoring the areas to their original condition to the extent possible. In cases where soil compaction has occurred, the construction crew or a restoration contractor uses various methods to alleviate the compaction, or as negotiated with landowners.

The ROW agent contacts the landowners once construction is completed to determine if the clean-up measures have been to their satisfaction and if any other damage may have occurred. If damage has occurred to crops, fences or the property, the Applicant will compensate the landowner. In some cases, an outside contractor may be hired to restore the damaged property as near as possible to its original condition.

### 8.5.2 Substation Restoration Procedures

Upon completion of construction activities, the Applicant will restore the remainder of the site. Post-construction reclamation activities include the removing and disposing of debris, dismantling all temporary facilities (including staging areas), employing appropriate erosion control measures and reseeding areas disturbed by construction activities with vegetation similar to that which was removed.

## 8.6 Operation and Maintenance

### 8.6.1 Transmission Line

Access to the ROW of a completed transmission line is required to perform periodic inspections, conduct maintenance and repair damage. Regular maintenance and inspections will be performed during the life of the transmission line to ensure its continued integrity. Generally, the Applicant will inspect the transmission lines at least

once every other year. Inspections will be limited to the ROW and to areas where obstructions or terrain may require off-ROW access. If problems are found during inspection, repairs will be performed and the landowner will be compensated for any loss.

The ROW will be managed to remove vegetation that interferes with the operation and maintenance of the transmission line. Native shrubs that will not interfere with the safe operation of the transmission line will be allowed to reestablish in the ROW. The Applicant's practice provides for the inspection of 115 kV transmission lines every two years to determine if clearing is required. ROW clearing practices include a combination of mechanical and hand clearing, along with herbicide application, where allowed, to remove or control vegetation growth. Noxious weed control with herbicides will be conducted on a two-year cycle around structures and anchors.

Annual operating and maintenance costs associated with these transmission lines are estimated to be on the order of $22,000. Actual transmission line specific maintenance costs will depend on setting, the amount of vegetation management necessary, storm damage occurrences, structure types, age of the line, etc. The Project facilities will primarily be routed along highway right of way with relatively little tree maintenance required.

### 8.6.2 Substation Maintenance Procedures

Over the life of the substation, annual inspections will be performed for safety, and quarterly inspections will be performed to maintain equipment and make necessary repairs. Routine maintenance will be conducted as required to remove undesired vegetation that may interfere with the safe and reliable operation of the substation.

## 8.7 Transmission Line Reliability

### 8.7.1 Appleton Area

Under normal operating conditions, a radial 115 kV line extending from Ortonville provides electrical energy for customers in the Appleton area. It is not possible to maintain acceptable voltage levels during unplanned loss of this radial 115 kV line at summer peak conditions. Upgrading the existing Appleton-Canby 41.6 kV to 115 kV will provide a highly needed second 115 kV source into the Appleton area ensuring sufficient voltage support during all critical contingencies.

### 8.7.2 Dawson/Canby Area

Presently, the Canby 115/41.6 kV transformer is very near its capacity limit during summer peak conditions and exceeds its thermal limits during extreme summer peak conditions such as the heat wave experienced in July of 2006. During the recent hot weather, the load at Dawson needed to be served from Appleton in order to avoid overloading the Canby transformer. Furthermore, voltage levels at Dawson are expected to drop below acceptable normal operating levels and below emergency operating levels in the Canby area during the loss of the Canby 115/41.6 transformer by the year 2008.

Upgrading the existing 41.6 kV line to 115 kV removes the load at Dawson from the Canby 115/41.6 kV transformer and places it on the 115 kV system. This relieves overloading concerns on the Canby transformer until approximately the year 2030. Placing the Dawson load on the 115 kV system also provides benefit to the Canby area during the loss of the Canby transformer. Without the Dawson load on the 41.6 kV system, the existing backup sources are able to provide adequate voltage support in the Canby area.

## 8.8 Electric and Magnetic Fields

Both the Minnesota Environmental Quality Board and the Public Utilities Commission have addressed the matter of electric and magnetic fields ("EMF") with regard to high voltage transmission lines. The general conclusion is that there is "insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and adverse health effects." In the Matter of a Route Permit for the Eastwood 115 kV Project, PUC Findings of Fact, Conclusions, and Order, Finding No. 55, MPUC Docket No. E002/TR-05-1192. The EQB has made similar findings with respect to EMF in a number of separate dockets over the past few years for high voltage transmission lines. E.g., Docket Nos. 03-64-TR-Xcel (the Lakefield 161 kV transmission line); 03-73-TR-Xcel (the Buffalo Ridge 345 kV transmission line); 04 84 Tr Xcel (the Buffalo to White 115 kV transmission line); and 04-81-TR-Air Lake-Empire (a 115 kV transmission line in Dakota County). The findings of the EQB and the discussion in the Environmental Assessments prepared on each of those Projects are pertinent to this issue with respect to the transmission lines proposed here. Documents from those matters are available on the PUC webpage: http://energyfacilities.puc.state.mn.us.

### 8.8.1 Electric Fields

Voltage on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with HVTLs extends from the energized conductors to other nearby objects, such as the ground, towers, vegetation, buildings and vehicles. The electric field from a transmission line gets weaker with increasing distance from the transmission line. Nearby trees and building material also greatly reduce the strength of transmission line electric fields.

The intensity of electric fields is associated with the voltage of the transmission line and is measured in kilovolts per meter (kV/m). Transmission line electric fields near ground are designated by the difference in voltage between two points (usually 1 meter).

The proposed transmission line will have a peak magnitude of electric field density of approximately 0.29 kV/m underneath the conductors, 1 meter above ground level. The predicted levels are significantly less than the maximum limit of 8.0 kV/m, which has been a permit condition imposed by the EQB in other transmission line applications. The standard was designed to prevent serious hazard from static discharges when touching large objects, such as tractors, parked under HVTLs of 500 kV or greater. The predicted electrical fields for the proposed transmission line when operated at maximum capacity

levels are shown in Table 9. The closest residence to the Appleton/Canby route is 140 feet away from the nearest structure.

**Table 9. Predicted Electric Fields from Proposed Transmission Line Operated at Maximum Capacity (kV/m)**

| Conductor Size | Distance from center of transmission line corridor (feet) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | -300 | -200 | -100 | -50 | -30 | 0 | 30 | 50 | 100 | 200 | 300 |
| Single Pole Davit Arm, 115 kV transmission line with 954 ACSS | .005 | 0.01 | 0.04 | 0.10 | 0.19 | 0.29 | 0.15 | 0.10 | 0.04 | .01 | 0.005 |

### 8.8.2 Magnetic Fields

Current passing through any conductor, including a wire, produces a magnetic field in the area around the wire. The magnetic field associated with HVTLs surrounds the conductor and decreases rapidly with increasing distance from the conductor. The magnetic field is expressed in units of magnetic flux density, expressed as gauss (G).

There are no federal or Minnesota exposure standards for magnetic fields. The EQB and the PUC have recognized that Florida (a 150 milligauss limit) and New York (a 200 milligauss limit) are the only two state standards in the country. The general standard is one of prudent avoidance.

The predicted magnetic fields for the proposed transmission line are shown in Table 10. The predictions were calculated for the transmission line using maximum capacity of a transmission line conductor of 954 ACSS and not the 266 ACSR that is the base conductor of the line. This conservatively over-predicts the magnetic fields that will be generated under normal operation. Given this scenario the highest predicted magnetic field directly below the line is 12 milligauss, more than an order of magnitude below the Florida and New York standards.

**Table 10. Predicted Magnetic Field from Proposed Transmission Line Operated at Maximum Capacity (milligauss)**

| Conductor Size | Distance from center of transmission line corridor (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -300 | -200 | -100 | -50 | 0 | 50 | 100 | 200 | 300 |
| Single Pole, 115 kV transmission line with 954 ACSS | 0.23 | 0.51 | 1.9 | 5.2 | 12.0 | 5.6 | 1.7 | 0.49 | 0.22 |

## 8.9 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. By code, electrical systems, including farm systems and utility distribution systems, must be grounded to the earth 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, EMF 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. 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.

# 9 ENVIRONMENTAL ANALYSIS OF PROPOSED ROUTE

## 9.1 Environmental Setting

The proposed route lies within the Prairie Grassland region of Minnesota. According to the DNR, the route lies within the Minnesota River Prairie subsection of the Prairie Parkland Province under the Ecological Classification System. The Minnesota River Prairie is a landscape dominated by large till plains on either side of the Minnesota River and characterized by gently rolling terrain, except where it is split by the broad Minnesota River Valley. Elevations along the route range from approximately 940 to 1,150 feet above mean sea level.

Presettlement vegetation consisted primarily of tallgrass prairie with small islands of wet prairie. The primary present day use of the land along the route is for agriculture; few remnants of native vegetation are present. Many of the wetlands have been drained and many of the smaller watercourses have been channelized to increase the acreage of land available for agricultural production.

The majority of the route crosses cropland used to grow corn and soybeans. Communities near the route are primarily small farm-based towns. A few Wildlife Management Areas ("WMA") and Waterfowl Production Areas ("WPA") are present near the route, along with several wetlands. Relatively few forested areas are present; most wooded areas are adjacent to farmsteads.

## 9.2 Impacts to Human Settlement

### 9.2.1 Displacement

The proposed route follows an existing ROW. There are no homes within 100 feet of the route, and five homes within 300 feet of the route. No homes will be within the proposed ROW. No displacement is anticipated. The Applicant will work with landowners to address alignment adjustments or structure placement, as necessary.

### 9.2.2 Noise

Noise is measured in units of decibels ("dB") on a logarithmic scale. The A weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. For example, a noise level change of 3 dBA is barely perceptible to average human hearing while a 5 dBA change in noise level is noticeable. Two sources of noise will be associated with the completed Project: conductors and substations.

Land use activities associated with residential, commercial, and industrial land are grouped together into Noise Area Classifications ("NAC"). Minn. Rules part 7030.0050. Residences, which are typically considered sensitive to noise, are classified as NAC 1. Each NAC is assigned both daytime (7 a.m. to 10 p.m.) and nighttime (10 p.m. to 7 a.m.) limits for land use activities within the NAC. Minn. Rules part 7030.0040. Table 11

shows the Minnesota Pollution Control Agency ("MPCA") daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a 1-hour period; L50 is the dBA that may be exceeded 50 percent of the time within an hour, while L10 is the dBA that may be exceeded 10 percent of the time within 1 hour.

**Table 11. MPCA Noise Limits by Noise Area Classification (dBA)**

| Noise Area Classification | Daytime | | Nighttime | |
|---|---|---|---|---|
| | L50 | L10 | L50 | L10 |
| 1 | 60 | 65 | 50 | 55 |
| 2 | 65 | 70 | 65 | 70 |
| 3 | 75 | 80 | 75 | 80 |

Typical noise sensitive receptors along the route will include residences, churches, and schools; however, most of the land use along the route is rural agricultural land. Current average noise levels in these areas are typically in the 30 to 40 dBA range and are considered acceptable for residential land use activities. Ambient noise in rural areas is commonly made up of rustling vegetation and infrequent vehicle pass-bys. Higher ambient noise levels, typically 50 to 60 dBA, will be expected near roadways, urban areas and commercial and industrial properties in the project area. Conductor and substation noise will comply with state noise standards.

Noise concerns for this Project may be associated with both the construction and operation of the energy transmission system. Construction noise is expected to occur during daytime hours as the result of heavy equipment operation and increased vehicle traffic associated with the transport of construction personnel to and from the work area. Any exceedences of the MPCA daytime noise limits will be temporary in nature and no exceedences of the MPCA nighttime noise limits are expected for this Project.

Operational noise will be associated with the transmission conductors and transformers at substations that may produce audible noise under certain operational conditions. The level of noise depends on conductor conditions, voltage level and weather conditions. Noise emission from a transmission line occurs during heavy rain and wet conductor conditions. In foggy, damp or rainy weather conditions, transmission lines can create a subtle 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 a 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 may produce audible noise higher than rural background levels. During dry weather, audible noise from transmission lines is an imperceptible, sporadic crackling sound.

The nearest residence to the Appleton substation is approximately 340 feet away, and is shielded by a windrow. Changing the transmission voltage at this substation will not result in perceptible changes in noise for the residence. The nearest residence to the

Dawson substation is approximately 360 feet away, across U.S. Highway 212. Changing the transmission voltage at this substation, and expanding the substation to the north (away from the residence) will not result in perceptible changes in noise for the residence. The nearest residence to the Canby substation is approximately 1,500 feet away, and is shielded by a windrow. Changing the transmission voltage at this substation will not result in perceptible changes in noise for the residence. Table 12 shows the predicted noise levels at different distances from the proposed 115 kV transmission line.

**Table 12. Predicted Audible Noise from 115 kV Appleton to Canby Transmission Line (dBA)**

| Conductor Size | Distance from center of transmission line corridor (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -300 | -200 | -100 | -50 | 0 | 50 | 100 | 200 | 300 |
| 115 kV transmission line | 21 | 23 | 26 | 29 | 31 | 29 | 26 | 23 | 21 |

To mitigate noise levels associated with construction activities, work will be limited to daytime hours between 7 am and 10 pm weekdays. Occasionally there may be construction outside of those hours mentioned or on a weekend if the Applicant has to work around customer schedules, line outages, or has been significantly impacted due to other factors. Heavy equipment will also be equipped with sound attenuation devices such as mufflers to minimize the daytime noise levels.

Operational noise levels are not predicted to exceed the state noise limits and therefore no mitigation is required.

### 9.2.3 Aesthetics

The Project is a rebuild and/or change in voltage level of an existing line located along existing utility ROW from the Appleton substation to the Canby substation. The Project follows paved state and local highways and two lane county roads that are mostly local and rural in character resulting in no significant impacts to the visual character of this area. Additionally, the proposed transmission line follows existing ROW that will cross Lac qui Parle Wildlife Management Area, which has potential as a unique visual resource. Lac qui Parle WMA consists of large tracts of native prairie interspersed with numerous wetland basins. The existing transmission line also crosses the Minnesota River just south of Appleton.

The proposed Project will result in minimal perceptible changes to the viewshed. The proposed route follows the existing transmission line, and the proposed structures will be similar to, but slightly taller (10 feet) than, the existing structures along the route. Figure 1 shows the existing structures at the Minnesota River crossing. Figure 2 shows a photosimulation of the proposed structure at this same location. Crossing the Lac qui Parle WMA and the Minnesota River will not perceptibly change the existing viewshed of the area because the proposed route will follow the existing transmission line ROW. The potential aesthetic impact resulting from new, slightly taller, structures between Appleton and Dawson will be imperceptible to most viewers.

Aesthetic impacts are expected to be minimal because the proposed Project is a rebuild of an existing line between Appleton and Dawson and an approximately 1.5 mile segment along U.S. 212 west of Dawson; the remainder of the Dawson to Canby segment will not require new structures. Landowners have been and will be consulted to identify concerns related to the transmission line, any potential substation expansion, and aesthetics. In general, mitigation includes enhancing positive effects as well as minimizing or eliminating negative effects. Potential mitigation measures include:

- Location of structures, ROW and other disturbed areas will be determined by considering input from landowners or land management agencies to minimize visual impacts.

- Care shall be used to preserve the natural landscape; construction and operation shall be conducted to prevent any unnecessary destruction, scarring or defacing of the natural surroundings in the vicinity of the work.

- To the extent practicable, rivers shall be crossed in the same location as existing transmission lines.

**Figure 1. Existing Structures at the Minnesota River Crossing**

**Figure 2. Proposed Structures at the Minnesota River Crossing**

### 9.2.4 Socioeconomic

The Project is located within Lac qui Parle, Swift and Yellow Medicine Counties in southwestern Minnesota.

The socioeconomic setting of the proposed project area was evaluated on a regional basis, comparing data for the area along the project route with average data for Lac qui Parle, Swift and Yellow Medicine Counties and the state of Minnesota. Data was compiled from the 2000 and 1990 U.S. Census. Table 13 summarizes the socioeconomic characteristics within the project area.

Because impacts to socioeconomics will be generally short-term and beneficial, no mitigation is necessary or proposed.

**Table 13. Socioeconomic Characteristics Within the Project Area**

| LOCATION | POPULATION* | 1990 | CHANGE | PER CAPITA INCOME | PERCENTAGE OF POPULATION BELOW POVERTY LEVEL |
|---|---|---|---|---|---|
| **STATE OF MINNESOTA** | **4,919,479** | **4,375,099** | **12.4%** | **$23,198** | **7.9** |
| **LAC QUI PARLE COUNTY** | **8,067** | **8,924** | **-9.7%** | **$17,399** | **8.5** |
| **SWIFT COUNTY** | **11,956** | **10,724** | **11.5%** | **$16,360** | **8.4** |
| **YELLOW MEDICINE COUNTY** | **11,080** | **11,684** | **-5.2%** | **$17,120** | **10.4** |
| **APPLETON TOWNSHIP, SWIFT COUNTY** | **232** | **233** | **-0.4%** | **$20,714** | **4.1** |
| **HANTHO TOWNSHIP, LAC QUI PARLE COUNTY** | **154** | **134** | **14.9%** | **$12,854** | **2.3** |
| **CERRO GORDO TOWNSHIP, LAC QUI PARLE COUNTY** | **256** | **303** | **-15.6%** | **$16,486** | **1.6** |
| **RIVERSIDE TOWNSHIP, LAC QUI PARLE COUNTY** | **301** | **370** | **-18.6%** | **$19,205** | **11.1** |
| **HAMLIN TOWNSHIP, LAC QUI PARLE COUNTY** | **185** | **215** | **-14%** | **$15,948** | **8.8** |

| LOCATION | POPULATION* | 1990 | CHANGE | PER CAPITA INCOME | PERCENTAGE OF POPULATION BELOW POVERTY LEVEL |
|---|---|---|---|---|---|
| **PROVIDENCE TOWNSHIP, LAC QUI PARLE COUNTY** | **186** | **214** | **-13.1%** | **$19,254** | **10.5** |
| **OSHKOSH TOWNSHIP, YELLOW MEDICINE COUNTY** | **249** | **249** | **0%** | **$14,263** | **10.4** |
| **HAMMER TOWNSHIP, YELLOW MEDICINE COUNTY** | **233** | **374** | **-37.7%** | **$22,013** | **12.4** |
| **APPLETON** | **2,871** | **1,552** | **85.0%** | **$12,429** | **14.7** |
| **DAWSON** | **1,539** | **1,626** | **-5.4%** | **$19,084** | **7.4** |

**Estimated 2005 populations for the State of Minnesota, Lac qui Parle County, Swift County and Yellow Medicine County show population changes between 2000 and 2005 of 4.3%, -5.7%, -5.3% and -5.7%, respectively. Estimate 2005 populations are not available for the cities or townships in the project area.*

Increasing the transmission outlet capability within the project area will benefit the surrounding communities in general. Upgrading the utility lines will serve the growing demand of the region. Although Lac qui Parle, Swift and Yellow Medicine counties have been experiencing declining population, larger cities, such as Appleton, are growing.

Construction activities for this Project will be short term. Impacts to social services would be unlikely because of the short-term nature of the construction project. In the short-term, revenue would likely increase for some local businesses, such as hotels, restaurants, gas stations and grocery stores, due to workers associated with construction of the Project.

Rebuilding the existing utility lines will result in some minor short and long term economic impacts for the surrounding communities. Long term benefits would include improved utility service, which is beneficial to local economies.

Up to 27.0 acres of agricultural land may be temporarily removed from production during transmission line construction between Appleton and Dawson and the rebuild section along U.S. 212 west of Dawson. Permanent agricultural land conversion associated with the transmission line poles in these segments will be less than 0.23 acres. No agricultural impacts are expected to occur in the remainder of the Dawson to Canby segment because existing structures will be used. Landowner compensation will be established by individual lease agreements. In general, agricultural areas surrounding transmission line poles can still be farmed. Because the proposed transmission line is along an existing

route, impacts will be limited to the existing utility corridor. Project construction will not cause additional impacts to leading industries within the project area. The Prairie Correctional Facility is located greater than 0.5 mile to the east of the proposed route and will not be affected by construction.

Short term impacts will result from the activities associated with construction. Long term impacts will result from the new utility infrastructure and will include improved utility service.

### 9.2.5 Cultural Values

Cultural values include those perceived community beliefs or attitudes in a given area that provide a framework for that community's unity. The communities in the vicinity of the Appleton-to-Canby Route primarily have cultural values steeped in rural agriculture and light industry. Values within the region include individualism and loyalty to local businesses and service providers. The communities along the Appleton-to-Canby Route also value their heritage and pioneer roots as settlers of the rivers, lakes, and prairies of the vicinity.

Historically, the railroads that cross the region were important for gathering agricultural goods and transporting them to markets. Agriculture and farm-related business remain central to the regional economy. The area has a diversified agricultural mix of livestock and crops, including wheat, corn, soybeans and alfalfa, hogs, and dairy and beef cattle.

The construction of the proposed transmission facilities will serve the region with a stable power supply. As the urban centers of the Western Minnesota region continue to grow, and the diverse economic base continues to expand, the available power supplied by upgraded and additional facilities will likely encourage this development and afford the residents a stable economic environment in which to live and work. In addition, these opportunities presented by the diverse economy may continue to encourage civic pride; tourism may benefit from this unity as well.

Because no adverse impacts to cultural values are anticipated, no mitigation is necessary or proposed.

### 9.2.6 Recreation

There are many existing recreational resources within the Project vicinity, including parks, trails, rivers, and museums. Popular activities include camping, fishing, hunting, bird watching, canoeing, boating, swimming, biking, hiking, and riding ATVs and snowmobiles. The Department of Natural Resources Wildlife Management Areas and USFWS Waterfowl Production Areas provide opportunities for viewing wildlife and intact ecosystems.

Table 14 is a list of the recreational resources found within or in the vicinity of the Project.

**Table 14. Recreational Resources Within Project Area**

| Location | Resource |
|---|---|
| Federal | Minnesota River Valley National Scenic Byway |
| State | Minnesota River (Wild and Scenic Designation)<br>Highway 75 – "Historic King of Trails"<br>Lac qui Parle WMA<br>Hantho WMA<br>Ohnah WMA<br>Hamlin WMA |
| County/Regional | Minnesota River Valley Birding Trail<br>Snowmobile Trail<br>Stonehill Regional Park |
| Local | Appleton Golf Course<br>Canby Golf Course<br>Dawson Campground<br>Dawson Gnomes<br>Dawson Golf Course<br>Historic Lund-Hoel House/Museum Encompassing Canby Area<br>Canby Depot Visitor and Information Center |

Because only 21.5 miles of the 42 miles will actually be upgraded, there will be little impact on recreation. However, where rebuilt lines are constructed, the visual setting for people biking, hiking, boating or birding near the new lines may be affected. It is also possible that clearing vegetation underneath the utility lines will decrease the wildlife habitat within the immediate vicinity, potentially impacting viewing opportunities. Again, since there is an existing line in place, there will be very limited need to clear vegetation.

The proposed route crosses two snowmobile trails both in Lac qui Parle County – one in Hantho Township, and one at the intersection of U.S. Highway 212 and CR 25 in the City of Dawson. The proposed transmission line will likely stay within the same ROW corridor, and therefore, will not introduce any significantly new structures to the visual field of snowmobilers. This recreational use will not be impacted by the proposed route.

The proposed route is adjacent to a planned DNR construction project located along upper Lac qui Parle Lake along MN State Highway 119. The DNR project involves constructing a safe parking location for approximately 10 vehicles, adding fishing platforms, and providing all four bridge abutments with sidewalks or steps for access some of which meets the standards under the Americans with Disabilities Act. The project is designed to improve accessibility of this recreational site and reduce the hazards of the existing parking situation. The Applicant has already made contact with

the DNR and both parties have verbally agreed that the rebuilt line will not significantly impact the DNR's plan. (See Appendix G-1) The Applicant will continue to work with the DNR to ensure that new poles and the safe parking area will be able to coexist.

The Minnesota River Valley Birding Trail follows the route along State Highways 119 and 40. The trail is a project of Audubon Minnesota and connects the best birding sites within the Minnesota River Valley, providing opportunities for bird watching and enjoying wildlife. The existing transmission line crosses the Minnesota River Valley Birding Trail. Rebuilding the transmission line will not change the recreational uses of the trail in the crossing area.

Rebuilding the existing utility line from the City of Appleton to the City of Canby along existing transmission right-of-way will minimize any impacts to recreational resources. Because structures will be placed within existing utility right-of-way, and impacts to previously undisturbed parks or management areas will be unlikely. Currently, the existing transmission line crosses through the Lac qui Parle WMA along State Highway 119. The rebuilt transmission line will likely stay within the same ROW corridor, and therefore will not introduce any significantly new structures to the visual field of recreationists. Permanent disturbance of wildlife habitat will also be minimized, so impacts to hunting and wildlife observation will be avoided.

Rebuilding the utility line in the Lac qui Parle WMA will involve crossing the Minnesota River. Since the existing line crosses the river, no significant changes to visual setting or recreational uses for people using this section of the river will be expected. Rebuilding the existing transmission line will not affect the Wild and Scenic portion of the Minnesota River located more than 10 miles downstream of the Project. The Applicant will coordinate with the DNR to ensure utility line construction will not impact the proposed DNR recreational parking and access site Project.

No impacts to recreational resources within the Cities of Appleton, Canby, and Dawson, such as the golf courses, museums, city parks, or campgrounds, are expected.

The Minnesota River Valley National Scenic Byway and Highway 75 run through the route. Utility lines already are part of the landscape along these highways. The recreational uses of these resources will not be affected, as it will involve rebuilding existing transmission line within the same right of way.

Because no impacts to recreation are anticipated, no mitigation is necessary or proposed.

### 9.2.7 Public Services

The Project generally runs through rural areas; Appleton and Dawson are the two communities with typical public services, such as natural gas, public water supply (wells), public wastewater treatment (some septic), cable television, in addition to electricity and telephone.

Because the route follows existing transmission line ROW, no impacts to public services are anticipated and therefore no mitigation is necessary.

### 9.2.8 Radio, Television, and Cellular Phone

Table 15 shows the telecommunications antennas registered within 2 miles of the route. They include two TV antennas, one land-mobile broadcast tower, two FM radio towers, four cellular towers, and 10 other types of towers.

**Table 15. Antenna Inventory**

| County | Telecommunication Tower | Township | Sections | Number of Registered Antennas |
|---|---|---|---|---|
| Swift | Antenna Structure Registration ("ASR") | Appleton | 14, 25 and 26 | 3 |
| | Cellular | Appleton | 26 | 2 |
| | FM Radio | Appleton | 25 | 2 |
| | Land Mobile (broadcast) | Appleton | 14 | 1 |
| | Microwave | Appleton | 14 and 15 | 2 |
| | TV | Appleton | 25 | 2 |
| Lac qui Parle | Microwave | Riverside | 16 and 21 | 3 |
| | ASR | Hamlin | 21 and 30 | 2 |
| | Cellular | Hamlin | 21 and 30 | 2 |

Development of the proposed transmission route will avoid known telecommunications facilities. No radio or television signal interference directly from the transmission of electricity is anticipated because of the differences in frequency of the signals. It is possible that localized interference could occur as a result of electric discharges across small gaps in the transmission system hardware or from the development of partial electric discharges from the line itself (generally referred to as "corona"). Corona is the breakdown of air into charged particles due to an electrical field. In the event that radio and television signals are impacted, the use of corona-free hardware and routing transmission line maintenance would eliminate the problem.

Because no impacts are anticipated, no mitigation is proposed.

### 9.2.9 Residential, Commercial and Industrial Land Use

The Project covers a variety of land use patterns in a generally rural environment. The route runs along State Highway 119 continuing along U.S. Highway 212 and U.S. Highway 75. The route consists primarily of agricultural land, with wetland, grassland, forest, pasture and hayland, and residential land uses scattered throughout. The route passes through industrial zones of Appleton and Dawson.

#### 9.2.9.1 Swift County

The proposed Project is located in southwestern Swift County. The Swift County Current Land Use Map shows that a majority of the route crosses areas zoned for agriculture, urban development and shoreland management. The shoreland management zones are defined as 40-acre parcels of land that contain shorelands associated with lakes and streams. In this Project, the Minnesota River is defined as a shoreland management area by Swift County.

The Project borders the town of Appleton. According to the Appleton Zoning Map, the corridor is beyond the city limits and runs along commercial and industrial park zoning districts near the western edge of Appleton.

The Appleton Municipal Airport is within two miles of the Project route in Section 16 of Appleton Township. The route passes through areas within Airspace Obstruction Zoning and Land Use Safety Zoning, as described in the Appleton Municipal Airport zoning ordinance.

#### 9.2.9.2 Lac qui Parle County

The proposed Project crosses central Lac qui Parle County in Hantho, Cerro Gordo, Riverside, Hamlin, and Providence townships. According to the Lac qui Parle Land Use Map, the route crosses agricultural, wetland, grassland, forest, pasture and hayland, commercial zoning, and residential land uses.

The Project route also crosses the town of Dawson. According to the 2002 Dawson Zoning Map in the 2002 Comprehensive Plan, the route crosses the industrial zoning district in the northwest corner of Dawson.

#### 9.2.9.3 Yellow Medicine County

The proposed Project is within northwestern Yellow Medicine County. According to the Yellow Medicine County Land Use Map, the route crosses areas zoned for agricultural land use.

The southern end of the Project route is approximately two miles northeast of the City of Canby. The Project route is inside the Airport Obstruction Zoning and Land Use Safety Zoning associated with the Canby Municipal Airport, which is approximately two miles southwest of the southern Project terminus.

Impacts to land use as a result of the Project are expected to be minimal. Since the route follows an existing 41.6 kV line, construction within transmission ROW will minimize placement of structures in other land uses. Construction of the facility would not change the possible land uses for any area. The Applicant will work with the Appleton and Canby Municipal airports to ensure that structures comply with airport safety zones and ordinances.

No impacts to residential, commercial or industrial land uses are anticipated; therefore no mitigation is proposed.

## 9.3 Impacts on Land-based Economics

### 9.3.1 Tourism

Tourist destinations within the project vicinity include parks, trails, rivers, and museums. Popular activities include camping, fishing, hunting, bird watching, canoeing, boating, swimming, biking, hiking, viewing gnomes (in Dawson) and riding ATVs and snowmobiles. The WMA and WPA within the project area provide opportunities for viewing wildlife and intact ecosystems. Historic houses provide the chance to learn about the regional and local history. No impacts on tourism are expected, therefore no mitigation is necessary.

### 9.3.2 Prime Farmland

The U.S. Department of Agriculture Natural Resources Conservation Service ("NRCS") defines prime farmland soils as having:

> "…the best combination of physical and chemical characteristics for producing food, feed, forage, fiber and oilseed crops…" is "…an adequate and dependable water supply from precipitation or irrigation. They have a favorable temperature and growing season with acceptable levels of acidity or alkalinity, content of salt or sodium, and few or no rocks. They are permeable to water and air, are not excessively erodible and are not saturated with water for long periods of time. They do not flood frequently or are protected from flooding (7 C.F.R. § 657)."

Soils listed as farmland of statewide importance are defined as:

> "…those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable (7 C.F.R. § 657)."

Along the proposed route, approximately 84.9 percent of the soils are listed by the NRCS as prime farmland, prime farmland when drained or farmland of statewide importance. The Appleton to Dawson and Dawson to Canby sections cross soils with approximately 71.4 percent and 97.7 percent, respectively, designated as prime farmland, prime when drained or farmland of statewide importance.

The Project will result in permanent and temporary impacts to prime farmland. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur. Permanent impacts will occur as a result of structure placement along the route of the transmission line. The Applicant estimates permanent impacts to prime farmlands or soils of statewide importance along the Appleton-Dawson

section at approximately 0.16 acres, and temporary impacts of approximately 19.3 acres. Along the Dawson-Canby section, no impacts to prime farmland are anticipated because existing structures will be utilized, except in the approximately 1.5-mile segment along U.S. Highway 212 west of Dawson where new structures will be constructed. In this segment, approximately 0.02 acre of permanent impacts and approximately 2.2 acres of temporary impacts to prime farmlands or soils of statewide importance are expected to occur.

The Applicant will work with landowners to minimize impacts to farming operations along the route. By rebuilding along existing transmission ROW, impacts can be minimized. The Applicant will compensate landowners for any crop damage or soil compaction that may occur during construction.

### 9.3.3 Transportation

The transportation network that may be used to develop and operate this Project is comprised of various county, trunk and U.S. highways. Few urban areas exist within the project area; three of the primary cities are Appleton, Canby and Dawson. Various active railroad lines are present within the project area.

In general, the proposed route is located in rural areas served by highways with relatively low traffic volume. Given the functional capacity limits of 4,000 and 6,000 vehicles per day, congestion is not a primary factor on any of the roadways along the routes.

The Appleton Municipal Airport and the Canby Municipal Airport are located near the route. The route would be affected by Airspace Obstruction Zoning and Land Use Safety Zoning at both airports.

Three active rail lines are located along the routes, as documented in Table 16. Temporary and permanent easements for both construction and utility line operation would be required from the BNSF Railway Company. Construction activities would be regulated by the carrier and any disruptions to rail service would require approval by the by the carrier.

**Table 16. Active Rail Lines – Appleton-to-Canby Route**

| Operator | Subdivision | Segment | Classification |
|---|---|---|---|
| BNSF Railway Company | Appleton Sub | Benson-Aberdeen | Main Line |
| BNSF Railway Company | Watertown Sub | Appleton-Yale | Branch Line |
| BNSF Railway Company | Hanley Falls Sub | Hanley Falls-Madison | Branch Line |

Temporary access for the rebuild of transmission lines along the route would be along the existing transmission line ROW or by short spur trails from the existing road network to the ROW. Temporary guard structures would be used to string conductor over existing roads and railroads. The structures typically consist of directly imbedded poles with a horizontal cross piece to support the conductor at sufficient height above traffic.

Temporary traffic impacts associated with equipment are material delivery and worker transportation.

Access to modify the existing substations would be from existing roads and would only cause minor and temporary disruption to traffic. Given the small number of workers and construction vehicles, traffic disruptions would be minimal and localized.

A review of county highway capital improvement plans showed no major road work along the route. General upkeep of the roads along the route will take place.

Short-term localized traffic delays are anticipated. The impacts resulting from construction and operation of the proposed transmission lines and modifications to substations would be less than significant for transportation.

During transmission line and substation modification construction activities, delays to railroad operations due to construction vehicles or equipment crossing tracks will be avoided. Construction will be coordinated with railroad operators.

When appropriate, pilot vehicles will accompany the movement of heavy equipment. Traffic control barriers and warning devices will be used when appropriate. All necessary provisions will be made to conform to safety requirements for maintaining the flow of public traffic. Construction operations will be conducted to offer the least possible obstruction and inconvenience to public traffic. The construction contractor would be required to plan and execute delivery of heavy equipment in such a manner that would avoid traffic congestion and reduce likelihood of dangerous situations along local roadways.

### 9.3.4 Mining and Forestry

Notable mining resources in the area include the quaternary sands and gravels present in glacial outwash deposits. Active gravel pits are located in proximity to the cities of Appleton, Dawson and Canby; these operations are more than a mile away from the route. Two inactive gravel pits are located within 1 mile of the route. The gravel pits are located east of the route in Swift County (NE ¼ of Section 27 in Appleton Township) and south of the route near Dawson in Lac qui Parle County (SE ¼ of Section 20 in Riverside Township). The route would not impact these inactive pits. Based on a review of available pit maps for the counties of Lac qui Parle, Swift and Yellow Medicine counties, the route would not impact active mining or quarrying operations and no mitigation would be necessary. The primary tree cover in the Project area is associated with waterways and homesteads.

No economically important forestry resources are located along the proposed route alignment. Because the proposed route follows an existing transmission line, impacts to shelterbelts are not anticipated. Clearing of the ROW in forested areas will be limited to the amount necessary to permit the safe and reliable operation of the transmission line.

Mitigation measures for potential impacts to forestry would be as follows: clearing for access to the ROW that is necessary for passage of construction equipment will be

limited to only those trees necessary; vegetation within these temporary access points will be restored; native shrubs that will not interfere with the safe operation of the transmission line will be allowed to reestablish in the ROW.

## 9.4 Archaeological and Historic Resources

For this review, information on known archaeological and historic resources along the route was gathered June 16, 2006, from the State Historic Preservation Office (SHPO) in St. Paul, Minnesota. Historic property location maps, site forms, and survey reports were among the sources consulted.

One previously-identified archaeological resource, a pre-contact lithic scatter, is within 500 feet of the proposed route in Hamlin Township. In addition, 64 previously inventoried standing structures have been recorded within one mile of the proposed route. Previously-identified standing structures include community and commercial buildings, residences, civic structures, churches, farmsteads, schools, a bridge, a fairground and a railroad depot. Construction dates of these inventoried structures generally range from the 1880s to the 1950s. Many of the structures are centered in cities or towns.

Properties in Dawson include the individually National Register of Historic Places (NRHP)-listed Commercial Bank Building, the individually NRHP-listed Dawson Carnegie Library and the individually NRHP-listed Dawson Armory. Other properties include 46 additional structures in Dawson, eight structures in Appleton, two in Cerro Gordo Township, one in Hamlin Township, one in Hantho Township, and three in Oshkosh Township.

Because the proposed Project is the rebuild of an existing line and is adjacent to highways for 90% of the length, the corridor has already been disturbed and the likelihood of affecting archaeological resources is relatively low. Archaeological sites may be disturbed during construction of transmission structures, substations and substation expansions, maintenance structures, staging areas or access roads. Historic buildings or other sites may be impacted as well in that construction of modern transmission structures may compromise the integrity of a historic viewshed from or to above ground archaeological and historic resources. However, since there is a line already in place, the Applicant does not foresee a significant visual change.

No impacts to the NHRP-listed structures in Dawson are expected to result from construction of the Project. The three structures are between 0.33 and 0.5 mile from the proposed transmission line. No discernible change to the viewshed from these structures will occur as a result of rebuilding the existing line along the existing route with slightly taller structures.

The Applicant will make every effort to avoid impacts to identified archaeological and historic resources. In the event that an impact would occur, the Applicant will consult with SHPO and invited consulting parties (particularly Native American Tribes and other State and Federal permitting or land management agencies) on whether or not the resource is eligible for listing in the NRHP. While avoidance of the resource would be a

preferred action, mitigation for Project-related impacts on NRHP-eligible archaeological and historic resources may include an effort to minimize Project impacts on the resource and/or additional documentation through data recovery.

## 9.5 Natural Environment

### 9.5.1 Air Quality

The entire area encompassing the route is currently in attainment with National and Minnesota Ambient Air Quality Standards for all criteria pollutants. Corona and nitrogen oxide emissions are the primary air quality concerns related to transmission lines. Corona can produce ozone and oxides of nitrogen in the air surrounding the conductor. Corona consists of the breakdown or ionization of air in a few centimeters or less immediately surrounding the conductors. It occurs when the electric field intensity, or surface gradient on the conductor, exceeds the breakdown strength of air. Usually some imperfection, such as a scratch on the conductor, or a water droplet, is necessary to cause corona.

Ozone 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, inhibits the production of ozone. Ozone is a very reactive form of oxygen and combines readily with other elements and compounds in the atmosphere.

An article, *Environmental Impact of Power Generation*, Issues in Environmental Science and Technology (Jeffers, 1999) summarizes ozone and nitrous oxide data collected underneath high-voltage power lines. No impact was detected at ground level. At 9 meters (30 feet) above ground level there is a slight increase in measurable ozone, which ranged from 0-8 parts per billion ("ppb"). The article stated that observed nitrogen oxide concentrations were negligible, at around one-fourth of the ozone concentration.

The Environmental Protection Agency promulgated regulations on the permissible concentrations of ozone and oxides of nitrogen. The national standard is 0.08 parts per million ("ppm") on an 8-hour averaging period. 40 CFR Part 50. The Minnesota State Ambient Air Quality Standard is 0.08 ppm based upon the fourth highest 8-hour daily maximum average in one year. Minn. Rules part 7009.0080.

Studies designed to monitor the production of ozone under transmission lines have generally been unable to detect any increase in ozone levels. U.S. DOE 1996: Delivery of the Canadian Entitlement Final Environmental Impact Statement (DOE/EIS-0197); *Environmental Impact of Power Generation*, Issues in Environmental Science and Technology (Jeffers, 1999). Based on the data provided in the studies above, there will be no measurable impacts relating to ozone along the route.

Temporary and localized impacts to air quality may occur during construction due to the disturbance of topsoil, which raises fugitive dust particles.

Temporary impacts from fugitive dust will be minimized or avoided using BMPs. Oil and other petroleum derivatives will not be used for dust control. Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, will not be operated until repairs or adjustments have been made.

### 9.5.2 Water Resources

The route lies within the Pomme de Terre River, Upper Minnesota River and Lac qui Parle River watersheds of the Upper Minnesota River Basin. Within the portion of the route in Swift County, surface water flows generally towards the Pomme de Terre River; within Lac qui Parle and Yellow Medicine counties the water generally flows towards the Lac qui Parle River.

Hydrologic features, such as wetlands, lakes, rivers and floodplains perform several important functions within a landscape, including flood attenuation, ground water recharge, water quality protection and wildlife habitat production.

Wetlands are defined by the United States Army Corps of Engineers ("USACE") as "Waters of the U.S." and are subject to jurisdiction under Section 404 of the Clean Water Act (1973). Waters of the U.S. include both wetlands and non-wetlands that meet USACE criteria. In Minnesota, all wetlands are regulated under the Wetland Conservation Act and Section 404 of the Clean Water Act, Minnesota Statutes § 103G.222-.2373 requires coordination with Board of Waste and Soil Resources and Section 404 of the Clean Water Act by the USACE.

Public Waters are water basins and watercourses of significant recreational or natural resource value in Minnesota as defined in Minnesota Statutes § 103G.005. The Minnesota Department of Natural Resources has regulatory jurisdiction over these waters.

Table 17 shows the Nation Wetlands Inventory ("NWI") wetlands. Along the route, there are 13 NWI wetlands with a total crossing length of 8,840 feet; palustrine emergent types make up the majority of the wetlands.

**Table 17. NWI Wetlands**

| Segment | Wetland Type | No. of Basins | Length of crossing (feet) | % of Wetlands in Segment |
|---|---|---|---|---|
| **Appleton-Dawson** | Lacustrine | 1 | 3018 | 14% |
| | Palustrine | - | - | - |
| | Emergent | 3 | 1378 | 43% |
| | Forested | 0 | 0 | 0% |
| | Scrub/shrub | 0 | 0 | 0% |
| | Unconsolidated bottom | 3 | 1640 | 43% |
| | Riverine | 0 | 0 | 0% |
| | **Total** | **7** | **6036** | |
| **Dawson-Canby** | Lacustrine | 0 | 0 | 0% |
| | Palustrine | - | - | - |
| | Emergent | 6 | 2804 | 100% |
| | Forested | 0 | 0 | 0% |
| | Scrub/shrub | 0 | 0 | 0% |
| | Unconsolidated bottom | 0 | 0 | 0% |
| | Riverine | 0 | 0 | 0% |
| | **Total** | **6** | **2804** | |
| | | | | |

The proposed route crosses three Minnesota DNR Public Waters Inventory ("PWI") basins (one in Swift County and two in Lac qui Parle County) and 16 PWI creeks and streams (two in Swift County, 12 in Lac qui Parle and two in Yellow Medicine County). Table 18 shows the PWI resources for the route.

**Table 18. PWI Waters**

| County | Name | Type | Location |
|---|---|---|---|
| **Swift** | Pomme de Terre River | River/stream | T120N, R43W, Section 16 |
| | Lac qui Parle Lake (46 P) | Lake | T120N, R43W, Section 33 |
| | Minnesota River | River/stream | T120N, R43W, Section 33 |
| **Lac qui Parle** | Unnamed (293 P) | Lake | T119N, R43W, Section 16 |
| | Unnamed tributary to Emily Creek | River/stream | T119N, R43W, Section 21 |
| | Emily Creek | River/stream | T119N, R43W, Section 21 |
| | Unnamed tributary to Emily Creek | River/stream | T119N, R43W, Section 28 |
| | Public ditch to Lac qui Parle River | River/stream | T118N, R43W, Section 16 |
| | Public ditch to Lac qui Parle River | River/stream | T117N, R43W, Section 4 |
| | Unnamed tributary to West Branch Lac qui Parle River | River/stream | T117N, R44W, Section 23 |
| | West Branch Lac qui Parle River | River/stream | T117N, R44W, Section 20 |
| | Unnamed (106 P) | Lake | T117N, R44W, Section 32 |
| | Unnamed tributary to Lac qui Parle River | River/stream | T117N, R44W, Section 32 |
| | Unnamed tributary to unnamed tributary of Lac qui Parle River | River/stream | T116N, R44W, Section 8 |
| | Public ditch to unnamed Lac qui Parle River tributary | River/stream | T116N, R44W, Section 8 |
| | Public ditch to unnamed Lac qui Parle River tributary | River/stream | T116N, R44W, Section 20 |
| | Lazarus Creek | River/stream | T116N, R44W, Section 32 |
| **Yellow Medicine** | Tributary to Lazarus Creek | River/stream | T115N, R44W, Section 8 |
| | Public ditch to Lazarus Creek | River/stream | T115N, R45W, Section 26 |

The route crosses the 100-year floodplains associated with the Pomme de Terre River, Minnesota River, West Branch of the Lac qui Parle River and Lazarus Creek.

The Applicant anticipates that the Project will be able to avoid most wetland areas and surface water features, such as rivers and streams, by spanning the transmission line over the water bodies and/or placing poles along the road embankment above the wetland edge. No impacts to wetlands, streams, floodplains or impaired waters are anticipated where existing transmission line structures will be utilized. The 1.5-mile section west of Dawson does not cross any wetlands or impaired waters. The segment does cross the floodplain associated with the West Branch of the Lac qui Parle River. Approximately 10 poles will likely be placed in this floodplain, resulting in approximately 250 square feet of permanent impact and approximately 0.69 acre of temporary impact. Because of their small cross sections, the poles will not affect flood elevations. Additionally, the new structures will be replacing existing structures that are currently within the floodplain; therefore the total number of poles within the floodplain will remain approximately the same as existing conditions. The Applicant is working with the Department of the Army to mitigate impacts on wetlands (see Appendix G-4).

Rebuilding the Appleton-Dawson 41.6 kV transmission line that currently skirts the edges of the majority of the hydrologic features by following the highway ROW would minimize any new impacts to wetlands and floodplains. All streams will be spanned

along the Appleton-Dawson section of the proposed line. There are five NWI wetlands wider than the maximum span (300 feet) along the Appleton-Dawson section. Of those five wetlands, two are PWI basins. Based on the width of the NWI wetlands, 17 poles may be placed in wetlands, resulting in approximately 51,000 square feet (1.17 acres) of temporary impacts and approximately 425 square feet of permanent impact. Approximately 11 of the 17 poles may be placed in PWI wetlands, resulting in approximately 33,000 square feet (0.76 acres) of temporary impact and approximately 275 square feet of permanent impacts of permanent impact. The new structures will be replacing existing structures that most likely are currently within wetlands; therefore the total number of poles within wetlands will remain approximately the same as existing conditions.

Along the Appleton-Dawson section, the line crosses one 100-year floodplain associated with the Minnesota River that is wider than 300 feet. Based on digital floodplain data, approximately 18 poles could be placed within this floodplain, resulting in 54,000 square feet (1.24 acres) of temporary impacts and 450 square feet of permanent impacts. The poles will not affect flood elevations. Additionally, the new structures will be replacing existing structures that are currently within the floodplain; therefore the total number of poles within the floodplain will remain approximately the same as existing conditions.

Because the Pomme de Terre River and Lazarus Creek are already impaired for turbidity (which is a measure of particles such as sediment and algae), any sediment reaching tributaries has the potential to further adversely affect water quality downstream. Construction of the Project would not affect the loading of ammonia, mercury or fecal coliform into the impaired waters within the project area, and would not affect biotic integrity or deplete oxygen levels.

Best Management Practices ("BMP") for sediment and erosion control would be implemented when dealing with water resources. These BMP would protect topsoil and adjacent water resources by trapping sediments; this would avoid contributing sediment to the Pomme de Terre River and Lazarus Creek which are impaired for turbidity.

In order to minimize contamination of water due to accidental spilling of fuels or other hazardous substances, the Applicant will follow its current spill prevention procedures to aid in the prevention of potential contamination due to a fuel or hazardous substance spill. Refueling would occur at sites away from drainages.

In the event that impacts to hydrologic features are unavoidable, the Applicant will work with the jurisdictional agencies to determine the best ways to minimize the impacts and create appropriate mitigation measures.

### 9.5.3 Soils and Geology

#### 9.5.3.1 Soils

Natural Resource Conservation Service Soil Survey data was reviewed to describe the soil resources in the vicinity of the route. Soils are generally grouped into categories known as "associations." A soil association has a distinctive pattern of soils, relief and

drainage, and is a unique natural landscape. Typically, an association consists of one or more major soils and some minor soils. The soils along the route consist of nine associations, plus Water (which are soils below standing water). Table 19 lists the soil associations found along the route.

**Table 19. Appleton-Canby Soil Associations**

| Soil Association | Percent of Corridor | General Description |
|---|---|---|
| AAZDAHL-HAMERLY-PARNELL | 4.5% | Moderately well drained and poorly drained soils that formed in loamy glacial till on undulating ground moraines |
| BURR-DU PAGE-CALCO | 3.8% | Well drained, moderately well drained and poorly drained soils (some with gypsic horizons) formed in calcareous clayey glacial lacustrine sediments and floodplain alluvium |
| CALCO-DU PAGE-NISHNA | 2.8% | Poorly drained and moderately well drained, nearly level soils formed in alluvial deposits |
| CANISTEO-VES-NORMANIA | 44.5% | Nearly level and undulating, well drained, moderately well drained, and very poorly drained loamy soils on till plains |
| COLVIN-TARA-SPICER | 2.8% | Nearly level and very gently sloping, poorly drained, very poorly drained, and moderately well drained silty soils on glacial till. |
| FULDA-SINAI-DOVRAY | 4.0% | Moderately well-drained, poorly drained, and very poorly drained nearly level to undulating soils formed in clay glacial till. |
| RENSHAW-SIOUX-SPOTTSWOOD | 1.8% | Nearly level to gently sloping, poorly drained and excessively drained and gravelly sandy loams and loams underlain by sand and gravel on outwash plains |
| ROTHSAY-COLVIN-HANTHO | 13.0% | Gently sloping, well drained, silt loam underlain by silt loam and sandy loam. |
| VES-CANISTEO-COLVIN | 22.5% | Well drained and poorly drained, undulating and nearly level soils formed in glacial till and lacustrine deposits |
| WATER | 0.2% | Soils under standing water (lakes and ponds) |

#### 9.5.3.2 Geology

The regional geology of the Project consists of Des Moines lobe deposits that overlie Precambrian and Cretaceous bedrock.

Most of the Project lies northeast of the Coteau des Prairies plateau which dominates the regional topography of southwestern Minnesota and eastern South Dakota. The Glacial River Warren floodplain (now occupied by the Minnesota River), defines much of the surficial geology in the region. Unconsolidated deposits in the area include glacial tills with intermittent boulder pavement sequences, and abandoned river channel deposits. Patchy glacial lake sediments overlying the local till are present in the area surrounding the river valley. Localized areas of gravel and sand are observed in former meltwater

channels and glacial lake outlets. Currently, the Minnesota River deposits silt and fine sand on the floodplain.

Unconsolidated sediments overlie bedrock within the majority of the project area. Bedrock outcrops in certain areas along the Minnesota River Valley and parts of the Coteau des Prairies plateau. The major constituent of the metamorphic rocks is a coarse-grained pink or white granite gneiss. Minor rock bodies in this unit are of mafic and/or granitic composition. The Sioux Quartzite is extremely resistant to erosion and therefore forms the underlying core of the high topography of the Coteau des Prairies and other prominent ridges in the area. The Cretaceous rocks generally consist of poorly consolidated quartz sands, lignitic clay, and soft dark gray shale.

The glacial cover in this area consists of approximately 150 to 300 feet of till overlying a layer of Cretaceous sediments 0 to 200 feet thick. The glacial till is underlain by silty outwash sand and gravel 20 to 90 feet thick near Appleton. The glacial till is inundated with many surficial and buried sand and gravel lenses. The Cretaceous sediments are mainly composed of shale with a lower mantle of sandstone or sand. The bedrock geology consists of a thin covering of Cretaceous sediments overlying the Precambrian crystalline rock.

The Project is expected to result in approximately 31.0 acres of temporary impact to soils along the segments where new poles will be installed. The Project is expected to result in 0.26 acres of permanent impact to soils.

Few geological constraints on design, construction, or operation are anticipated in the Project area. If dewatering is found to be necessary during construction (i.e., during pole embedding), the effects on water tables would be localized and short term, and would not affect geologic resources.

The Applicant will maintain sound soil conservation practices during construction and operation of the Project to protect topsoil and minimize soil erosion.

Because no impacts to geologic resources will occur, no mitigation is necessary or proposed.

### 9.5.4 Flora and Fauna

#### 9.5.4.1 Flora

The Project is located in the North Central Glaciated Plains Ecoregion. The native vegetation was primarily tallgrass prairie; floodplain forests along the Minnesota River and other streams were vegetated predominantly with silver maple, elm, cottonwood, and willow. Agriculture is the dominant land use in the area and has displaced much of the native vegetation.

**Table 20. Land Cover**

| Cover Type | Area (acres) | Percent of Route |
|---|---|---|
| Agriculture (Cropland and Pasture) | 10,235 | 94.08% |
| Deciduous Forest | 343 | 3.15% |
| Farmsteads, rural residences | 289 | 2.66% |
| Grassland/Shrubland | 7.0 | 0.06% |
| Water | 5.5 | 0.05% |

*Source: International Coalition Land Use/Land Cover data (1990)*

Along the route, there are several areas where natural vegetation is being managed. Managed areas such as WMA and WPA were analyzed within 1 mile of the route alignment. These resources provide potential habitat for native vegetation, wildlife and rare and unique resources. A distance of 1 mile was used because studies have shown that impacts to wildlife (particularly waterfowl) are negligible at distances greater than 1 mile from wildlife habitat (Avian Power Line Interaction Committee, 1994). Table 21 is a summary of the state and federal lands within one mile of the proposed alignment:

**Table 21. State and Federal Lands within 1 Mile of Proposed Alignment**

| Land Type | Owner/Land Interest | Flora |
|---|---|---|
| Lac qui Parle Lake | COE | Aquatic and wetland vegetation |
| Unnamed WPA (5) | USFWS | Wetland vegetation |
| Wetland Easements (8) | USFWS | Wetland vegetation |
| Habitat Easement (1) | USFWS | Wetland and grassland vegetation |
| Ohnah WMA | DNR | Grassland and wetland vegetation |
| Hamlin WMA | DNR | Wetland vegetation |
| Lac qui Parle WMA | DNR | Wetland, aquatic, grassland and forest vegetation |

The route is within 1 mile of five WPA, three WMA, and eight U.S. Fish and Wildlife Service ("FWS") wetland easements and one FWS habitat easement.

The route crosses four native plant communities listed by the DNR: one mesic prairie community in Swift County, and three mesic prairie communities in Lac qui Parle County. Within 1 mile of the route, there are 24 additional natural communities listed by the DNR's Minnesota Natural Heritage and Nongame Wildlife Program 2005.

The route crosses Lac qui Parle WMA for a length of 2.4 miles (12,760 feet). Given the maximum span of 300 feet, approximately 43 poles will be placed within the WMA. Approximately 129,00 square feet (3.0 acres) of temporary impact and 1,075 square feet (0.02 acres) of permanent impact would occur within the WMA. The proposed route will follow the existing transmission line route through the WMA; therefore impacts to previously-undisturbed vegetation will be avoided.

The route crosses one U.S. Fish and Wildlife wetland easement for a length of approximately 1,670 feet. Although the NWI wetlands are narrower than the maximum span of 300 feet in this section, it is possible that existing poles are within a wetland, and that proposed poles would also be within a wetland. If possible, the Applicant will reduce the number of poles within this wetland by maximizing spans.

The route crosses the U.S. Fish and Wildlife WPA for a length of 4,880 feet. Given the maximum span of 300 feet, it is possible that 16 poles will be placed in the WPA. This would result in approximately 48,000 square feet (1.1 acres) of temporary impact and 400 square feet (>0.01 acres) of permanent impact.

The route crosses a FWS habitat easement for a length of approximately 1,935 feet. Given the maximum span of 300 feet, approximately seven poles will be placed within the easement. No impacts to wetlands within this easement will occur because they are smaller than the maximum span of 300 feet. Approximately 21,000 square feet (0.48 acres) of temporary impact and 175 square feet of permanent impact could occur in upland (grassland) vegetation.

The proposed transmission line will follow the existing transmission ROW, minimizing impacts to previously-undisturbed vegetation. No additional ROW or easements will be required within any of these managed areas.

The Applicant will continue to work with the DNR and FWS to minimize and avoid impacts to sensitive flora along the route alignment, including the native vegetative communities. A threatened and endangered species survey was conducted in July 2006 where the route crosses Lac qui Parle WMA and the FWS WPA. No rare plants were found along the surveyed portions of the route. The Applicant will continue to coordinate with the appropriate agencies to determine appropriate minimization and mitigation measures within the WMA and FWS lands. Coordination will continue with the FWS to determine appropriate avoidance/minimization measures should it be necessary to place poles in wetlands within FWS easements. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a seed mix recommended by the local DNR management that is free of noxious weeds.

#### 9.5.4.2 Fauna

Although 94 percent of the land adjacent to the route is cultivated, there are WMA and WPA in the vicinity of the route that provide habitat for a variety of animal species. The WMA are managed by the DNR for wildlife production, with primary game species consisting of waterfowl, pheasants and white-tailed deer. Other wildlife that can be found in the area along the route include songbirds, small game mammals, such as squirrels and rabbits, and non-game animals, such as mice, raccoon, and red fox.

The Lac qui Parle WMA covers 23,976 acres, is located along the Minnesota River, and consists of Marsh Lake and Lac qui Parle Lake and prairie and wetland habitats, and is managed to preserve the fish, mammals, waterfowl, shorebirds and grassland birds

associated with the prairie pothole ecosystem. Marsh Lake, approximately two miles from the route, hosts the largest white pelican colony in North America. Minnesota DNR, Recreation Compass: Lac qui Parle WMA, Main Unit (2006).

There are also five WPAs within 1 mile of the route. These areas serve to protect breeding, forage, shelter and migratory habitat for waterfowl such as ducks, geese, herons, and egrets. WPAs also generally provide habitat for amphibians and small reptiles as well as small mammals.

There is minimal potential for the displacement of wildlife and loss of habitat from construction of the route. Wildlife that inhabit natural areas could be impacted in the short-term within the immediate area of construction. The distance that animals will be displaced will depend on the species. Additionally, these animals will be typical of those found in agricultural and urban settings and should not incur population level effects due to construction.

Raptors, waterfowl and other bird species may be affected by the construction and placement of the transmission lines. Avian collisions are a possibility after the completion of the transmission line. Waterfowl are typically more susceptible to transmission line collision, especially if the transmission line is placed between agricultural fields that serve as feeding areas, or between wetlands and open water, which serve as resting areas. The route passes through areas designated by the FWS and DNR joint assessment as having both important grassland and wetland habitats for waterfowl. In these areas, it is likely that waterfowl and other birds will be traveling between different habitats, potentially increasing the likelihood of avian conflicts with the transmission line. The Applicant recognizes that the FWS and DNR are concerned about these areas and will continue to work with these agencies to address their concerns.

There will be approximately 129,000 square feet (3.0 acres) of temporary impact and 1,075 square feet (0.02 acres) of permanent impact within Lac qui Parle WMA. The proposed route follows the existing transmission line alignment; therefore impacts to undisturbed wildlife habitat will be avoided. Impacts to managed wildlife habitat within the FWS WPA and wetland and habitat easements will be avoided by placing the poles outside of the boundaries.

To mitigate possible impacts to wildlife within WMAs and WPAs, the Applicant will span these habitats wherever feasible. In areas where complete spanning is not possible, the Applicant will minimize the number of structures placed in high quality wildlife habitat and will work with the DNR and FWS to come up with appropriate mitigation. Additionally, where appropriate, the Applicant will use mats to avoid compacting the soils. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a DNR recommended seed mix that is free of noxious weeds. See Appendix G-1 through G-3 regarding correspondence with FWS, DNR, and Lac qui Parle WMA.

The Applicant will also address avian issues by working with the DNR and FWS to identify any areas that may require marking transmission line shield wires and/or to use alternate structures to reduce the likelihood of collisions.

The Applicant is currently looking into reducing the amount of overhead distribution lines within the Lac qui Parle WMA through an agreement with the local Rural Electric Cooperative ("REC"). Undergrounding existing REC overhead lines could further reduce the potential for avian collisions. The Applicant will continue to coordinate with the DNR and REC on this issue.

## 9.6 Rare and Unique Natural Resources

### 9.6.1 Rare and Unique Species and Communities

Table 22 lists the rare and unique resources identified within 1 mile of the proposed route. These resources were identified using the DNR Natural Heritage database.

**Table 22. Rare and Unique Resources**

| Common Name | Scientific Name | Number of Occurrences | Federal Status | MN Status* | State Rank** | Habitat |
|---|---|---|---|---|---|---|
| Burrowing Owl | Speotyto cunicularia | 1 | Not Listed | END | S1 | Open areas with low ground cover. They nest in abandoned burrows of small mammals |
| Henslow's Sparrow | Ammodramus henslowii | 1 | Not Listed | END | S1 | Tall prairie with some forbs and shrubs |
| Dakota Skipper | Hesperia dacotae | 1 | Candidate | THR | S2 | Wet prairie and dry prairie dominated by bluestem grasses |
| Elktoe mussel | Alasmidonta marginata | 1 | Not Listed | THR | S2 | Riffle sections of small to medium sized streams with gravel and sand bottoms |
| Loggerhead Shrike | Lanius ludovicanus | 2 | Not Listed | THR | S2 | Grasslands and open, agricultural areas characterized by short vegetation and scattered trees, shrubs, or hedgerows |
| Marbled Godwit | Limosa fedoa | 2 | Not Listed | SPC | S3 | Prairies near marshes or ponds. They nest on the ground, usually in short grass |

| Common Name | Scientific Name | Number of Occurrences | Federal Status | MN Status* | State Rank** | Habitat |
|---|---|---|---|---|---|---|
| Powesheik Skipper | Oarisma powesheik | 4 | Not Listed | SPC | S3 | Wet mesic prairie with native grasses, sedges and a significant number of plants in the sunflower family |
| Regal Fritillary | Speyeria idalia | 1 | Not Listed | SPC | S3 | Large grassland areas or lightly grazed pasture lands with prairie remnants. Larval plants are violets. |
| Slender Milk-vetch | Astragalus flexuous | 4 | Not Listed | SPC | S3 | Mesic and dry mesic prairie |
| Soft Goldenrod | Solidago mollis | 1 | Not Listed | SPC | S3 | Dry or drying prairies, often found in open woods. Also frequently found along fence rows |
| Mousetail | Myosurus minimus | 3 | Not Listed | NON | S4 | Shallow still or slowly flowing waters. Muddy or sandy shorelines and areas with fluctuating water levels |
| Northern Grasshopper Mouse | Onychomy's poweshiek | 1 | Not Listed | NON | SNR | Grassland and shrub steppes |
| Upland Sandpiper | Bartramia longicauda | 7 | Not Listed | NON | S4 | Dry prairies |
| Dry Hill Prairie (Southern) | | 3 | Not Listed | None | S2 | |
| Dry Sand – Gravel Prairie (Southern) | | 1 | Not Listed | None | S2 | |
| Mesic Prairie (Southern) | | 23 | Not Listed | None | S2 | |
| Mussel Sampling Site | Freshwater Mussel Concentration Area | 1 | Not Listed | None | SNR | |
| Wet Prairie (Southern) | | 1 | Not Listed | None | S2 | |

** END – Endangered; THR – Threatened; SPC – Special Concern; NON – no legal status, data being gathered for possible future listing; None – Terrestrial communities do not have assigned status, but are considered important ecologically.*

*** State rank is assigned to species and terrestrial communities to reflect the extent and condition of that element. Ranks range from 1 – in greatest need of conservation, to 5 – secure under present conditions. NR – not ranked; X – extirpated, species believed to be extirpated from the State; H – historical, species occurred historically in State but has not been verified in the last 20 years.*

*Source: Minnesota Natural Heritage and Nongame Wildlife Program. 2005. Threatened Natural Communities and Rare Species List*

Two state endangered species (burrowing owl and Henslow's sparrow), one federal candidate/state threatened species (Dakota skipper), two state threatened species (elktoe mussel and loggerhead shrike) and five species of special concern have been documented within 1 mile of the route. Many of the rare and unique resources identified along the route are associated with remnants of prairie land within Lac qui Parle WMA. Twenty-eight DNR-listed natural communities are within 1 mile of the proposed route alignment.

Additionally, a sensitive species survey was conducted on July 5 – 6, 2006, in the Lac qui Parle WMA and the FWS WPA (areas identified as having the highest potential for sensitive species). No federally-listed species and no state-listed sensitive plant species were found within the vicinity of the route. State-listed special concern marbled godwits and regal fritillaries were found within a quarter mile of the route, and habitat potentially exists for other state-listed animal species within the WMA and WPA.

Approximately four poles will likely be placed in areas identified as having moderate biodiversity significance, and approximately 40 poles will likely be placed in areas having high biodiversity significance. The proposed route will follow the existing transmission line route through these areas; therefore, impacts to previously-undisturbed vegetation will be avoided.

Dry uplands and shelterbelts and hedgerows are important habitat for loggerhead shrikes, a state threatened species. Shelterbelts and hedgerows will be conserved as possible, and dry prairie communities will be spanned where practical. Although the proposed line will be constructed along existing transmission ROW, it is possible that shelterbelts or hedgerows may be cleared to ensure the safe and reliable operation of the transmission line according to National Electric Reliability Council ("NERC") standards.

Two of the listed special concern species (mousetail and marbled godwit) are associated with wetlands and stream banks and could be impacted by placement of structures in these habitats, or by increased erosion and sedimentation that could occur if BMPs are not employed. The Applicant will span streams and wetlands along the route, whenever feasible.

The elktoe mussel is a state endangered species found in the Minnesota River. Impacts to this species could occur if pole construction along the river crossing does not utilize BMPs. However, care will be taken along the river crossing to minimize impacts to the river.

When structures must be placed in areas of prairie remnants, native communities, and areas of biodiversity significance, the number of structures within these lands will be

minimized. Areas disturbed due to construction activities will be restored to pre-construction contours and will be reseeded with a seed mix recommended by the local DNR management and is free of noxious weeds.

Additionally, host plants for listed organisms (such as the Dakota skipper and Regal Fritillary) will be preserved and the area will be restored with the appropriate seed mix containing host plants, as applicable.

In the event shelterbelts and hedgerows for a known loggerhead shrike population must be affected, coordination will occur with the DNR on appropriate mitigation.

The Applicant will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion and sedimentation. Rebuilding along existing transmission right of way will avoid impacting undisturbed habitat along the route in the WMA and WPA. The Applicant will continue to coordinate with the DNR and FWS to ensure that sensitive species associated with the Minnesota River are not impacted by the Project; possible mitigation measures could include replacing structures pole for pole in the river crossing area.

# 10 APPLICATION OF CRITERIA

## 10.1 Certificate of Need

The Public Utilities Commission has established in its rules (Minnesota Rules part 7849.0120) the criteria that it will apply to determine whether an applicant has established that a new proposed large energy facility is needed. Otter Tail Power Company has described in this Application the reasons why a Certificate of Need should be granted to upgrade the Appleton/Canby line. Those reasons are readily apparent and are summarized here.

### 10.1.1 Denial Would Adversely Affect the Energy Supply

The transformer at the Canby substation overloads under normal operating conditions during certain peak demand situations on hot summer days. Even with the installation of cooling fans several years ago, that transformer cannot safely support all of the demand on hot summer days. When the source to the Canby substation is opened to avoid overheating the transformer, the loss of another line to the Appleton substation due to a storm event or some other occurrence would cause low voltage to result in the area and could overload other equipment. Moreover, as load continues to grow in the Appleton/Canby area, the area only becomes more vulnerable.

Load growth is occurring; the company's forecasts are reasonable and they are supported by actual historical data showing growth every year for the past fourteen years. This growth is not the result of promotional activities by the company, and even though Otter Tail Power Company has undertaken conservation programs system-wide and realized significant savings, growth is occurring. There is a need for improved service in the area.

### 10.1.2 There Is No Reasonable and Prudent Alternative

The proposed Project is the rebuild of an existing line. There is no less expensive way to increase the capacity of the system. The impact to the environment and to human settlement will be essentially negligible because there already is a transmission line in the same location. The upgrade of the line will be a reliable solution because the line will operate continuously for years and years.

### 10.1.3 The Project Will Protect the Environment and Provide Benefits

The line follows an existing right-of-way. No new right-of-way will be required if the Commission approves the existing route. Much of the existing line is along county, state and U.S. highways. Rivers and waterbodies will be crossed in the places the line presently crosses them. The Applicant is working with the Department of Natural Resources, U.S. Fish and Wildlife Service, along with other agencies to ensure that the Minnesota River and Wildlife Management Areas are protected.

There can be no doubt that the new line will benefit customers in the service area by ensuring an adequate power supply for years to come.

### 10.1.4 The Project Will Comply with All Applicable Requirements

The Applicant has identified in Section 2.5 the other permits and approvals that may be required for the Project. The Applicant has demonstrated that it will comply with all applicable requirements and obtain all necessary permits.

## 10.2 Route Permit

According to Minnesota Statutes § 116C.53, subd. 1, it is the policy of the state of Minnesota to locate high voltage transmission lines in an orderly manner that minimizes adverse human and environmental impacts and ensures continuing electric power system reliability and integrity. The Public Utilities Commission has promulgated standards and criteria for issuing route permits. Minnesota Rules part 4400.3050. That rule provides that the Commission shall issue route permits for high voltage transmission lines that are consistent with state goals to conserve resources, minimize environmental impacts and impacts to human settlement, minimize land use conflicts, and ensure the state's electric energy security through efficient, cost-effective transmission infrastructure.

The Appleton/Canby 115 kilovolt line proposed here satisfies all the criteria that are applied in evaluating a new transmission line project. Following an existing transmission line route, as this line does, conserves resources and minimizes environmental impacts and other impacts. Upgrading the line to 115 kV capability helps ensure a reliable and secure power source in the area served by this line. It is less expensive and less intrusive than other alternatives.

For all the reasons described in this Application, and summarized in section 10.1 above regarding the reasons why a Certificate of Need should be issued, the Commission should also issue a Route Permit.

## 10.3 Conclusion

Otter Tail Power Company respectfully requests that the Public Utilities Commission issue a Certificate of Need authorizing construction of a 115 kilovolt transmission line between the Canby substation in Yellow Medicine County and the Appleton substation in Swift County, a distance of approximately 42 miles.

In addition, Otter Tail Power Company requests that the Commission issue a Route Permit at the same time designating the route for this 115 kV line. Otter Tail Power Company requests that the permit designate the existing route that the present 41.6 kV line follows, with the exception of a short segment to connect the line to the new Canby substation. The company requests that the Commission designate a route wider than the necessary right-of-way, to allow the company to take into account landowner preferences in determining the precise locations for the structures.