BIG STONE

PARTNERS IN TRANSMISSION

Otter Tail Corporation dba Otter Tail Power Company
Central Minnesota Municipal Power Agency
Great River Energy
Heartland Consumers Power District
Montana-Dakota Utilities Co.
Southern Minnesota Municipal Power Agency
Western Minnesota Municipal Power Agency
(as represented by Missouri River Energy Services)

Application to the Public Utilities Commission for Route Permits

Big Stone Transmission Project

December 9, 2005

MNPUC Docket No. E017, et. al./TR-05-1275

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The contents required for an application with the Minnesota Public Utilities Commission (PUC) under the Full Permitting Process are outlined in Minn. Rules 4400.1150. The PUC submittal requirements are listed in Table 1, with cross-references identifying where the information can be found in this application.

TABLE 1
COMPLETENESS CHECKLIST

Authority	Required Information	Where
4400.1150, Subp. 2	Route Permit for LHVTL	
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	3.2
C.	at least two proposed routes for the proposed high voltage transmission line and identification of the applicant's preferred route and the reasons for the preference	1.0, 6.3, 7.3, 8.3, 6.1.1, 6.2.1, 7.1.1, 7.2.1, 8.1.1, 8.2.1
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, 9.0, 3.5.1
E.	the environmental information required under 4400.1150, Subp. 3	6.0, 7.0, 8.0
F.	identification of land uses and environmental conditions along the proposed routes	6.1.2
G.	the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	10.2.2
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 B, Appendix F, Appendix G, Appendix H
I.	identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share ROW with the proposed line	4.2
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, 4.4
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	3.6, Appendix D
L.	a description of possible design options to accommodate expansion of the high voltage transmission line in the future	4.1.2
M.	the procedures and practices proposed for the acquisition and restoration of the ROW, construction, and maintenance of the high voltage transmission line	4.3
N.	a listing and brief description of federal, state, and local permits that may be required for the proposed high voltage transmission line	10.3
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	2.2, 2.3, Appendix A

Authority	Required Information	Where
4400.1150, Subp. 3		
A.	a description of the environmental setting for each site or route	6.1.1, 7.1.1, 8.1.1, 6.2.1, 7.2.1, 8.2.1
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	6.1.2, 7.1.2, 8.1.2, 6.2.2, 7.2.2, 8.2.2
C.	a description of the effects of the facility on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	6.1.3, 7.1.3, 8.1.3, 6.2.3, 7.2.3, 8.2.3
D.	a description of the effects of the facility on archaeological and historic resources	6.1.4, 7.1.4, 8.1.4, 6.2.4, 7.2.4, 8.2.4
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	6.1.5, 7.1.5, 8.1.5, 6.2.5, 7.2.5, 8.2.5
F.	a description of the effects of the facility on rare and unique natural resources	6.1.6, 7.1.6, 8.1.6, 6.2.6, 7.2.6, 8.2.6
G.	identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	6.3, 7.3, 8.3
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	6.1.2.10, 6.2.2.10, 7.1.2.10, 7.2.2.10, 8.1.2.10, 8.2.2.10
4400.1350		
Subpart 2	Notification to persons on general list, to local officials, and to property owners	Will be submitted within 15 days of Application submission.
4400.3150		
A.	effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services	6.3, 7.3, 8.3
B.	effects on public health and safety	6.3, 7.3, 8.3
C.	effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining	6.3, 7.3, 8.3
D.	effects on archaeological and historic resources	6.3, 7.3, 8.3
E.	effects on the natural environment, including effects on air and water quality resources and flora and fauna	6.3, 7.3, 8.3
F.	effects on rare and unique natural resources	6.3, 7.3, 8.3
G.	application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity	6.3, 7.3, 8.3
H.	use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries	6.3, 7.3, 8.3
I.	use of existing large electric power generating plant sites	6.3, 7.3, 8.3
J.	use of existing transportation, pipeline, and electrical transmission systems or rights-of-way	6.3, 7.3, 8.3
K.	electrical system reliability	6.3, 7.3, 8.3
L.	costs of constructing, operating, and maintaining the facility which are dependent on design and route	6.3, 7.3, 8.3

Authority	Required Information	Where
M.	adverse human and natural environmental effects which cannot be avoided	6.3, 7.3, 8.3
N.	irreversible and irretrievable commitments of resources	6.3, 7.3, 8.3
4400.3350	Wilderness Aeas	
Subpart 1	No high voltage transmission line may be routed through state or national wilderness areas	N/A
4400.3350	Parks and Natural Areas	
Subpart 2	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	N/A
Minn. Stat. §116C.57, subd. 4		
(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	4.4, 6.1.1, 6.2.1, 7.1.1, 7.2.1, 8.1.1, 8.2.1, 6.3, 7.3, 8.3
(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	6.1.1., 6.2.1, 7.1.1, 7.2.1, 8.1.1, 8.2.1. 4.1.2
(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	Evaluated in the CON.
(4)	Evaluation of the potential for beneficial uses of waste energy from proposed large electric power generating plants	N/A
(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	6.1.2.6, 6.2.2.6, 7.1.2.6, 7.2.2.6, 8.1.2.6, 8.2.2.6, 6.1.3, 6.2.3, 7.1.3, 7.2.3, 8.1.3, 8.2.3
(6)	Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted	6.3, 7.3, 8.3
(7)	Evaluation of alternatives to the applicant's proposed site or route proposed pursuant to subdivisions 1 and 2	6.0, 7.0, 8.0, 5.3
(8)	Evaluation of potential routes that would use or parallel existing railroad and highway rights-of way	4.2, 6.3, 7.3, 8.3
(9)	Evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations	6.3, 7.3, 8.3, 6.1.3.1, 6.2.3.1, 7.1.3.1, 7.2.3.1, 8.1.3.1, 8.2.3.1, 6.1.3.5, 7.1.3.5, 8.1.3.5, 6.2.3.5, 7.2.3.5, 8.2.3.5

Authority	Required Information	Where
(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	4.1.2, 4.5, 6.3, 7.3, 8.3
(11)	Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved	6.3, 7.3, 8.3
(12)	When appropriate, consideration of problems raised by other state and federal agencies and local entities	10.1, 10.2

1.0 EXECUTIVE SUMMARY

Seven utilities (collectively the Applicants) have submitted this Application to the PUC for a Route Permit for two new high voltage transmission lines (HVTLs). The utilities include: Otter Tail Power Company (Project lead), Great River Energy, Central Minnesota Municipal Power Agency, Heartland Consumers Power District, Montana-Dakota Utilities Co., Southern Minnesota Municipal Power Agency and Western Minnesota Municipal Power Agency (as represented by Missouri River Energy Services). The transmission lines will connect the existing and new Big Stone substations in South Dakota to different termination points in Minnesota (the Project).

As required by Minnesota law, the utilities have identified several possible route options for the two proposed transmission lines. One new transmission line would run from the Big Stone 230 kilovolt (kV) Substation in South Dakota to the Morris Substation near Morris, Minnesota, a total of approximately 48 miles, about 43 miles of which are in Minnesota. The other transmission line would run from the Big Stone 345 kV and 230 kV substations in South Dakota to Granite Falls, Minnesota, a distance of approximately 90 miles, 54 miles of which would be in the State of Minnesota. The Big Stone 230 kV Substation to Morris Substation transmission line would be constructed at 230 kV (Morris 230 kV transmission line). The Granite Falls transmission line would be constructed at 345 kV but operated initially at 230 kV (Granite Falls 345 kV transmission line). The construction of these two transmission lines was identified as System Alternative 1 in the Certificate of Need (CON) Application.

In addition, as part of the CON Application, the Applicants identified an alternative to System Alternative 1. System Alternative 2 identified a transmission line from the Big Stone Plant to the Willmar, Minnesota area. The Willmar transmission line would be constructed at 230 kV (Willmar 230 kV transmission line). As described in the CON Application and in this document, the Willmar alternative offers no advantages to the Morris 230 kV transmission line environmentally, electrically or economically, but in order to ensure that all options are considered, the Applicants have identified two possible routes to the Willmar area.

These two new transmission lines will serve two purposes: (1) provide an outlet for the power from the proposed Big Stone II (BSP II) and (2) increase the transmission capacity and improve reliability of the electric transmission system in the Buffalo Ridge area in Minnesota and South Dakota. The Granite Falls transmission line is proposed to be constructed at 345 kV to provide additional transmission capacity for future generation in the Buffalo Ridge region.

The Applicants have proposed to construct a new 600 megawatt (MW) power plant next to the existing unit at the Big Stone Plant (BSP I) in South Dakota. The proposed BSP II will provide additional generating capacity and baseload energy for the benefit of the Applicants' customers. An application for an Energy Facility Siting Permit was submitted to the South Dakota Public Utilities Commission (SD PUC) in July 2005 for authorization to construct BSP II. That application is available online at:

http://www.state.sd.us/puc/commission/dockets/electric/2005/EL05-022/application.pdf

On October 3, 2005, the Applicants submitted an application to the PUC for a CON for the two new transmission lines. The CON Application is available online at:

http://www.otpco.com/NewsInformation/BigStoneTransRegulatoryFilings.asp

On November 10, 2005, upon the representation by the Applicants that the Route Permit Application would be submitted within a few weeks, the PUC determined that it would combine the CON proceeding with the Route Permit proceeding. The PUC issued its Order to that effect on November 29, 2005 (Appendix A).

This document is the Route Permit Application for authorization to construct two new transmission lines in Minnesota. It is anticipated that a separate application for a Transmission Facility Siting Permit will be submitted to the SDPUC in the near future for authorization to construct the portion of the routes in the State of South Dakota.

The possible routes for the transmission lines are described more specifically as follows:

1.1 THE MORRIS 230 KV TRANSMISSION LINE ROUTE

The preferred route for the Morris 230 kV transmission line is along the route of an existing 115 kV transmission line. The utilities intend to rebuild the existing 115 kV transmission line to 230 kV standards. The alternative route is west of the preferred route to Malta Township, where it shifts to the east of the preferred route into the Johnson Junction Substation. The alternative is then north of the preferred route to the Morris Substation. The alternate route is along new transmission right-of-way (ROW) for 9.6 percent of the route. A map showing the preferred route and the alternative route is available at Appendix B.

1.2 THE WILLMAR TRANSMISSION LINE ROUTE

Two possible route options between the Big Stone Plant and the Willmar area have been identified and are examined in this Application. Both routes would require new transmission ROW.

1.3 THE GRANITE FALLS 345 KV TRANSMISSION LINE ROUTE

The Granite Falls 345 kV transmission line route preferred by the Applicants travels the first 36 miles in South Dakota and crosses the border just east and north of the Gary, South Dakota, where it continues essentially east for approximately 14 miles to the Canby Substation. From the Minnesota/South Dakota border to the Canby substation the transmission line will follow new ROW to the Canby Substation as a 345 kV transmission line, initially operated at 230 kV. From the Canby Substation to the Granite Falls Substation, the existing 115 kV transmission line will be rebuilt to the eastern edge of Hazel Run Township. It will also be designed as a 345 kV transmission line, but will initially be operated at 230kV. From the eastern edge of Hazel Run Township to the Granite Falls Substation (a distance of approximately 9.4 miles), the transmission line will be constructed to 230 kV standards. The preferred route is shown on the map in Appendix B.1. An alternative route between Canby, Minnesota and Granite Falls, paralleling the preferred route, is also examined in this document.

An alternative to the preferred route that was considered between Canby and the Big Stone Plant would place the transmission line on the Minnesota side of the border rather than on the South Dakota side. Two possible routes on the Minnesota side are examined in this document. These route options are shown in the map in Appendix B.2.

1.4 TRANSMISSION LINE STRUCTURES

The Applicants have identified possible routes that are up to 2,000 feet in width. While the actual ROW will be 125 feet for the Morris 230 kV transmission line and 150 feet for the Granite Falls 345 kV transmission line upon completion of construction, this wider route width is being proposed to allow for flexibility in determining the actual ROW at the time of construction so the Applicants can work with landowners on actual structure placement. The actual structure type will determined once final engineering analysis is complete. At this time, H-frame structures of wood or steel, are preferred by the Applicants. The structures on the Morris 230 kV transmission line will be 70 to 100 feet in height with average spans of 700 feet. The Granite Falls 345 kV transmission line will have, on average, 800 feet between spans and will be 80 to 120 feet high.

1.5 ASSOCIATED FACILITIES

1.5.1 SUBSTATION MODIFICATIONS

Regardless of which transmission lines and which routes are ultimately approved by the PUC, several substations will have to be upgraded. With the Morris 230 kV transmission line, the Johnson Junction Switch Station and the Morris Substation will both require additional equipment. The Johnson Junction Switch Station will become a substation as a transformer is added to the site and the station will be expanded by an area approximately 400 feet by 400 feet. No expansion is required at the Morris Substation.

With the Granite Falls 345 kV transmission line, the Canby Substation and the Granite Falls Substation will be upgraded with the addition of new equipment. The Canby Substation will need to be expanded to the south or east, on the order of 500 feet by 550 feet. The Granite Falls Substation has adequate space for the new equipment and will not have to be expanded in size.

If a transmission line to Willmar is ultimately selected by the PUC, the Willmar Substation will have to be upgraded and an area of approximately 1.5 acres will be required for the expansion. The Applicants propose to expand the substation to the north of the existing Willmar Substation.

1.5.2 TRANSMISSION LINE MODIFICATIONS

Additionally, transmission line modifications are needed for each of the System Alternatives. If System Alternative 1 is approved, a portion of the existing 115 kV transmission line into Ortonville Substation will be removed. However, if System Alternative 2 (a new transmission line to Willmar) is approved, this portion of transmission line will not be removed. Instead, the existing 115 kV transmission line system between the Big Stone 230 kV Substation, Ortonville and Morris will be rebuilt at 115 kV.

1.6 COSTS

The Morris 230 kV transmission line preferred route is estimated to cost $15.9 to $17 million. The Granite Falls 345 kV transmission line preferred route is estimated to cost $24.1 to $33.2 million. The Willmar transmission line preferred alternative is estimated to cost $24.1 to 29 million.

1.7 POTENTIAL ENVIRONMENTAL IMPACTS

The potential environmental impacts of the proposed transmission lines are addressed in detail in the Application. Some of the impacts, such as public health and safety and noise, are essentially the same regardless of which route is selected. A table comparing the potential impacts, such as number of houses within 300 feet of the transmission line and number of sensitive areas crossed along the various routes, is presented in the Application. For reasons discussed in the document, there are fewer impacts expected from the transmission lines along the routes preferred by the Applicants than along the alternative routes. One of the primary reasons for this is that the Applicants have selected routes that follow existing ROW as much as possible. The alternative routes require more new ROW.

The Applicants will implement Best Management Practices (BMPs) to minimize impacts from construction of the transmission lines. Agricultural land that is crossed will be restored after construction is complete, work in wetland areas will be conducted in the wintertime to the extent possible and runoff to surface waters will be controlled in accordance with State and Federal permits.

1.8 CONCLUSION

The data presented in this Application show that construction of the two new transmission lines along the routes preferred by the Applicants will comply with the applicable standards and criteria set out in the PUC Rule, part 4400.3050. The transmission lines are consistent with State goals to conserve resources, minimize environmental impacts, human settlement impacts and land use conflicts and ensure the State's electric energy security through efficient, cost-effective infrastructure.

The Applicants are requesting that the PUC issue a CON for the two new transmission lines, a 230 kV transmission line between the Big Stone 230 kV Substation and Morris Substation and a 345 kV transmission line, initially operated at 230 kV, between the Big Stone 230 kV Substation and the Granite Falls Substation, and that the PUC issue a Route Permit designating the routes preferred by the Applicants.

2.0 INTRODUCTION

This Section provides a brief overview of the regulatory processes that apply to the Project and identifies other required permits and approvals.

2.1 MINNESOTA ROUTE PERMIT

Minn. Stat. § 116C.57, subd. 2, provides that, "No person may construct a high voltage transmission line without a route permit from the [Public Utilities Commission]. A high voltage transmission line may be constructed only along a route approved by the [Public Utilities Commission]."

A "high voltage transmission line" is any a transmission line "designed for and capable of operation at a nominal voltage of 100 kilovolts or more." (Minn. Stat. § 116C.52, subd. 4). This same definition is incorporated into the PUC Rules (Minn. Rules parts 4400.0200, subp. 8). The Morris transmission line is designed for 230 kV; the Granite Falls transmission line is designed for 345 kV; therefore a Route Permit from the PUC is required.

Both of the transmission lines proposed here must cross the Minnesota/South Dakota border. Therefore, it will be necessary for Minnesota and South Dakota to establish the same crossing point. Minn. Stat. §116C.53, subd. 3, entitled "Interstate Routes", provides that "If a route is proposed in two or more states, the [PUC] shall attempt to reach agreement with affected states on the entry and exit points prior to designating a route." Only one crossing point has been identified for either the Morris 230 kV transmission line or the Willmar transmission line. However, two crossing points are possible with the Granite Falls 345 kV transmission line route, depending on whether the transmission line from Canby travels north on the Minnesota side of the border or on the South Dakota side.

2.2 CERTIFICATE OF NEED

A CON is also required from the PUC for the two proposed transmission lines (Minn. Stat. § 216B.243, subd. 2). The Applicants filed an application for a CON with the PUC on October 3, 2005. That application is available online at:

http://www.otpco.com/NewsInformation/BigStoneTransRegulatoryFilings.asp

In the past, a utility seeking a Route Permit from the Minnesota Environmental Quality Board (EQB) (the agency with the permitting authority prior to August 1, 2005, when the Legislature transferred the authority to the PUC, Minnesota Laws 2005, ch. 97, art. 3) normally already had a

CON from the PUC establishing the size and type of the transmission line and the endpoints. Even if the PUC had not made a final decision, the EQB was precluded by Minn. Stat. § 116C.53, subd. 3 ("When the Public Utilities Commission has determined the need for the project under section 216B.243, questions of need, including size, type and timing; alternative system configurations; and voltage are not within the board's siting and routing authority and must not be included in the scope of environmental review conducted under sections 116C.51 to 116C.69."), from considering such factors.

In this case, however, both issues relating to the CON and issues relating to permitting are still before the PUC. Because the CON matters have not yet been determined, selection of the endpoints for the transmission lines is still being considered. The PUC must decide, as part of the CON proceeding, whether to authorize a transmission line to Morris or a transmission line to Willmar. For reasons explained in the CON application, the Applicants believe that the transmission line to Morris is preferable, but because that decision has not been made, the Applicants have investigated possible transmission lines between the Big Stone substations and Willmar Substation. Also, because Minn. Stat. § 116C.57, subd. 2a, requires an applicant for a Route Permit for a transmission line in excess of 200 kV to propose at least two routes for any such transmission line, this Application is complicated by the fact that the Applicants not only have proposed two possible routes for the Morris 230 kV transmission line, they have proposed two possible routes for a Willmar transmission line. The Granite Falls 345 kV transmission line is also part of the Project, and two border crossings are being considered. The resulting four possible routes for the Granite Falls 345 kV transmission line are discussed in this Application.

Ultimately, the PUC is being asked to issue one Route Permit, establishing a route for the Granite Falls 345 kV transmission line and a route for the Morris 230 kV transmission line, as well as approving the associated facilities.

2.3 THE MPUC REGULATORY PROCESS

The rules that are applicable to the processing of this Application are found in Minn. Rules ch. 4400. These rules were originally promulgated by the EQB, but now apply to the PUC with the transfer of permitting authority from the EQB to the PUC, effective August 1, 2005 (Minnesota Laws 2005, ch. 97, art. 3, sec. 17). In addition, the Minnesota Department of Commerce (DOC) has been assigned the responsibility to conduct an environmental review of proposed transmission lines.

When the Applicants filed their CON application in early October, the Applicants suggested to the PUC that the process for the CON be combined with the process for the Route Permit. On

November 10, 2005, the PUC considered the question of whether to combine the processes and determined that it was appropriate to do so. The PUC issued its Order to that effect on November 29, 2005. A copy of that Order is included at Appendix A.

Once the Application is submitted, the PUC has 10 days to determine whether the Application is complete (Minn. Stat. § 116C.57, subd. 2a). The statute provides that an application is not incomplete if any missing information can be provided during the first phase of the process and the information is not essential for notice and initial public meetings.

The notice and initial public meetings relate to the development of the scope of environmental review that will be conducted. The DOC has the obligation to conduct the environmental review. The DOC will arrange for a scoping meeting in the area of the Project to solicit public input into the scope of the Environmental Impact Statement (EIS). The EIS will consider issues relating to both the need for the Project, such as size, type, timing, voltage and system configurations, and also issues relating to routing, such as construction impacts, environmental features, use of existing ROWs and impacts on homeowners.

As part of its November 29, 2005 Order, the PUC recognized that this whole matter will be referred to the Office of Administrative Hearings for assignment of an Administrative Law Judge (ALJ) to preside over the case. The PUC Order stated that the public hearings for the CON and route permitting processes be combined. This will allow the public the opportunity to comment on any aspect of the Project, whether relating to the need for the transmission lines or the routes to be approved. The Order also state that the question of how to conduct the evidentiary portion of the hearing would be deferred to a prehearing conference stage.

Once the hearing is concluded, the ALJ will make a recommendation to the PUC on both the need for the Project and the appropriate routes to approve. The ALJ's recommendation is not binding on the PUC. The PUC has, by statute, one year from the time the Route Permit Application is found complete to make a final decision (Minnesota Statutes § 116C.57, subd. 7).

2.4 SOUTH DAKOTA PROCEEDINGS

Both an Energy Conversion Facility Permit, for the proposed BSP II facility, and a Route Permit, for the South Dakota portion of the proposed transmission lines, will be required from the SD PUC. An application for the Energy Conversion Facility Permit for the BSP II facility was filed with South Dakota officials in July 2005. That application is available on the Internet at:

www.state.sd.us/puc/commission/dockets/electric/2005/EL05-022/application.pdf

The Applicants anticipate submitting an application for a Route Permit to the SD PUC before the end of the year.

2.5 FEDERAL ENVIRONMENTAL IMPACT STATEMENT

Because the Granite Falls 230 kV Substation and the Morris 230 kV Substation are owned by the Western Area Power Administration (Western) and the Applicants have requested interconnection at those facilities, a Federal EIS is required. The Federal EIS is being prepared by Western and will evaluate the corridors in which the routes are being considered. Western has identified corridors between the endpoints that it is examining as part of the Federal EIS process. These corridors are shown in Appendix B.3.

3.0 PROJECT INFORMATION

3.1 STATEMENT OF OWNERSHIP OF THE PROPOSAL

The proposed transmission lines will be paid for and co-owned by the Applicants identified in Section 3.2. The Applicants will also pay for and own the substation facilities, with the exception of the Granite Falls and Morris substations, which will be owned and operated by Western. Ownership of existing substations that require upgrades will remain with the current owner. The Applicants' financial and ownership interest in the transmission line and substation facilities is shown in Table 2. Otter Tail has been designated as the Project Lead to facilitate the construction of these facilities.

TABLE 2
APPLICANTS' FINANCIAL AND OWNERSHIP INTEREST IN THE PROPOSED TRANSMISSION FACILITIES

Utility	Percentage
Western Minnesota Municipal Power Agency	25.00
Great River Energy	19.33
Montana-Dakota Utilities Co.	19.33
Otter Tail Corporation dba Otter Tail Power Company	19.33
Southern Minnesota Municipal Power Agency	7.80
Central Minnesota Municipal Power Agency	5.00
Heartland Consumer Power District	4.20

There are route segments under consideration that involve underbuilding distribution lines owned by utilities that are not Applicants. The Applicants will work with these companies to establish ownership and operation standards for the segments affected.

Western owns, operates and maintains the Morris and Granite Falls substations, which have been proposed as points for interconnection for the Project. The extent of additions and modifications needed at the Morris and Granite Falls substations will not be identified until Western completes facility-related studies for the Project. However, since Western will design, own and operate any additions and modifications at these substations, any conditions resulting from the Minnesota CON and Route Permit affecting Western-owned facilities should not be the same as those typically required for facilities owned by a private developer.

Western's role as a power marketing administration within the United States Department of Energy (DOE) is to market and transmit electricity through HVTLs in accordance with Federal reclamation law. Western has special expertise and experience with industry standards and regulations. Western's role as a transmission provider will require the Applicants to comply with Western's open-access tariff, which reflects appropriate industry standards and regulations in order to interconnect to Western's transmission system.

Western is working with the DOC in developing the Federal EIS for the Project. Western will continue to coordinate with the DOC staff on the Federal EIS, future transmission system studies and required additions and modifications. However, by voluntarily agreeing to coordinate with the DOC staff, Western is not ceding any jurisdictional authority over Federal facilities to the State of Minnesota.

3.2 PERMITTEE/PROJECT LEAD

The Applicants for the Project are listed below. The contacts for each of the Applicants are also listed below; however, it is preferred that the Project Contact be contacted for information requests.

Project Lead:	Otter Tail Corporation dba Otter Tail Power Company 215 South Cascade Street Fergus Falls, Minnesota 56538
Contact:	Dean Pawlowski
Phone:	(218) 739-8947
Fax:	(218) 739-8442
Email:	dpawlowski@otpco.com

Project Contact:	Beverly Rund Otter Tail Power Company 215 South Cascade Street Fergus Falls, Minnesota 56538
Phone:	(218) 739-8249
Fax:	(218) 739-8629
Email:	brund@otpco.com

Permittee:	Central Minnesota Municipal Power Agency 459 South Grove Street Blue Earth, Minnesota 56013
Contact:	Donald Kom
Permittee:	Great River Energy 17845 East Highway 10 P.O. Box 800 Elk River, Minnesota 55330
Contact:	Gordon Pietsch
Permittee:	Heartland Consumers Power District P.O. Box 248 Madison, South Dakota 57042-0248
Contact:	John Knofczynski
Permittee:	Western Minnesota Municipal Power Agency, as represented by: Missouri River Energy Services 3724 West Avera Drive Sioux Falls, South Dakota 57109-8920
Contact:	Brian Zavesky
Permittee:	Montana-Dakota Utilities Co. 400 North 4th Street Bismarck, North Dakota 58501
Contact:	Lynn Paulsen
Permittee:	Southern Minnesota Municipal Power Agency 500 First Avenue SW Rochester, Minnesota 55902-3303
Contact:	Richard Hetwer

The individual Applicants and their respective general service areas are described below.

Otter Tail Corporation dba Otter Tail Power Company (Otter Tail) is an investor-owned diversified corporation, organized under the laws of the State of Minnesota. Otter Tail Power Company is the utility business segment of Otter Tail Corporation. Otter Tail is headquartered in Fergus Falls, Minnesota. It provides electricity to approximately 127,000 residential, commercial and industrial customers throughout Minnesota, South Dakota and North Dakota. Otter Tail was originally incorporated in 1907 and first delivered electricity in 1909 from the Dayton Hollow Dam on the Otter Tail River.

Central Minnesota Municipal Power Agency (CMMPA) is a not-for-profit municipal corporation and political subdivision of the State of Minnesota, headquartered in Blue Earth, Minnesota. CMMPA was formed in 1987 and has 15 members. CMMPA is responsible for supplying wholesale power to its members, who in turn provide low cost, reliable electric energy and related services directly to customers across south and central Minnesota.

Great River Energy (GRE) is a generation and transmission electric cooperative headquartered in Elk River, Minnesota, which provides electrical and related services to 28 member distribution cooperatives in Minnesota and Wisconsin. These member cooperatives distribute electricity to more than 600,000 homes, businesses and farms. The service territories of GRE's 28 members stretch from the southwest corner of Minnesota, with one member serving a small part of northwestern Wisconsin.

Heartland Consumers Power District (Heartland) is a not-for-profit public corporation and political subdivision of the State of South Dakota, headquartered in Madison, South Dakota. Created in 1969, Heartland supplies wholesale electric power and energy from a diverse mix of resources to 18 municipalities across southwestern Minnesota, northwestern Iowa and eastern South Dakota, as well as several State institutions and one electric power cooperative.

Missouri River Energy Services (MRES) is comprised of 59 municipally-owned electric utilities in the states of Minnesota, Iowa, North Dakota and South Dakota, of which 57 are MRES S-1 Power Supply Agreement customers. MRES has no retail loads, and all of its firm sales are made to municipal or wholesale utilities. MRES acts as an agent for the Western Minnesota Municipal Power Agency (WMMPA), which itself was incorporated as a municipal corporation and political subdivision of the State of Minnesota. WMMPA consists of 24 municipalities.

Montana-Dakota Utilities Co. (Montana-Dakota) is an investor-owned public utility that operates an integrated electric system in parts of Montana, North Dakota, South Dakota, and a separate electric system in Wyoming. Montana-Dakota is a division of MDU Resources Group, Inc., a diverse energy company located in Bismarck, North Dakota, which includes natural gas and oil production, construction materials and mining, domestic and international independent power production, electric and natural gas utilities, natural gas pipelines and energy services and utility services. Montana-Dakota provides electric and natural gas services to approximately 250 communities in the above states.

Southern Minnesota Municipal Power Agency (SMMPA) is a not-for-profit municipal corporation and political subdivision of the State of Minnesota, headquartered in Rochester, Minnesota. SMMPA was created in 1977 and has 18 municipally-owned utilities as members, located predominantly in south-central and southeastern Minnesota.

3.3 SYSTEM ALTERNATIVES

The PUC ruling on the CON will determine which of the following system alternatives will be selected.

System Alternative 1 was identified as the preferred alternative in the CON and includes the following:

1. A new 230 kV transmission line between the Big Stone 230 kV Substation in South Dakota and the Morris Substation, located west of Morris, within the Morris Corridor.
2. A new Granite Falls 345 kV transmission line (initially operated at 230 kV) between the Big Stone 230 kV Substation and the Granite Falls Substation. This transmission line would be constructed at 345 kV capacity to the eastern edge of of Hazel Run Township, where the transmission line turns north to Granite Falls. The Hazel Run Township to Granite Falls Substation segment would be constructed at 230 kV capacity.
3. Substation upgrades at the Canby, Granite Falls, Johnson Junction and Morris substations.
4. Removal of approximately 1.2 miles (6,270 feet) of 115 kV transmission line into the Ortonville Substation.

System Alternative 2 involves the following:

1. A new 230 kV transmission line between the Big Stone 230 kV Substation in South Dakota and the Willmar Substation, located south of Willmar, Minnesota, within the Willmar Corridor.
2. The 115 kV transmission line between Ortonville, Minnesota and Morris would be reconductored within the Morris Corridor.
3. A new Granite Falls 345 kV transmission line (initially operated at 230 kV) between the Big Stone 230 kV Substation and the Granite Falls Substation. This transmission line would be constructed at 345 kV capacity to the eastern edge of Hazel Run Township, where the transmission line turns north to Granite Falls. The Hazel Run Township to Granite Falls Substation segment would be constructed at 230 kV capacity.
4. Substation upgrades at the Canby, Granite Falls and Willmar substations.

Also as a part of this Project, Western is preparing a Federal EIS to analyze transmission corridor alternatives. The route application to the PUC considers routes within these corridors (Section 5.1). The route application identifies route alternatives for both the Morris 230 kV and Granite Falls 345 kV transmission lines proposed within the corridor alternatives identified in both the CON process and the Federal EIS alternative screening (Appendix B.3). Additionally, the route application addresses associated facilities, such as substation and transmission line modifications.

3.4 PROPOSED ROUTES

Minn. Stat. 116C.52, subd. 8 authorizes the PUC to grant a permit for a route width of up to 1.25 miles within which a ROW for HVTLs can be located. The Applicants request that the PUC approve a narrower corridor, 2,000 feet wide for the proposed route alignment. The Applicants believe this width will enable them to minimize impacts during design and construction and to address any routing issues that may occur along the proposed route alignment.

Appendix C.1 identifies the township, range and section that the rotue alignments cross. Appendix B.1 identifies the Project proposal. Appendix B.2 is the Project Overview Map and is an overview of the routes in relation to the corridors discussed in Section 5.1. A preferred route was chosen between each of the Project endpoints. Appendix B.4 identifies the preferred routes between the Project endpoints for both System Alternatives.

3.4.1 MORRIS TRANSMISSION LINE

3.4.1.1 Morris Route 1 Description (Preferred Route)

Morris Route 1 is identified on the overview map and detailed route maps in Appendix F. The Applicants request that the PUC consider Morris Route 1 as described below and shown on the route maps for the route permit. Since the Project is undergoing Federal and State review, there are several approvals that the Project must obtain for the Project to proceed. Additionally, these approvals constrain the ability of the Applicants to propose some routes, and due to the Federal EIS review occurring for this Project, the Applicants only considered route segments within the boundaries of the corridors being considered in the Federal EIS process.

The Applicants request that a 2,000-foot wide route be approved for Morris Route 1. This will give the Applicants reasonable flexibility in locating the transmission line. For the purposes of the request, the 2,000-foot wide route requested is indicated on the attached route maps in Appendix F.

The route intends to utilize H-frame structures and would begin at the Minnesota/South Dakota border south of Ortonville. Approximately 4 miles of the route would be in South Dakota for this route.

The route has been broken up into segments in order to describe the route. Segments included in the Morris Route 1 are: M1, M2, M3, M5, M7, M9, M10 and M17. Below is a description of the route, by segment, starting on the western end.

M1 begins at the Minnesota/South Dakota border and follows an existing 115 kV transmission line ROW, which crosses the Minnesota River. The route alignment then crosses MN Highway 7 and the segment ends at the top of the hill.

M2 begins on the east side MN Highway 7 and continues east for 1.5 miles where it turns north, crosses U.S. Highway 12 and continues to follow Township Road 135 until County State Aid Highway (CSAH) 12. At this point the segment turns northeast following CSAH 12 for approximately 0.6 miles.

M3 follows CSAH 12 through the Prairie WMA. The route continues northeast for approximately 2.4 miles to Township Road 104, where it crosses to the east side of CSAH 12. Once on the east side of CSAH 12 the transmission line will turn north-northeast again, then crosses back to the west side of the road and continuing northeast for approximately 0.85 miles to CSAH 10. At CSAH 10 the route alignment will turn east along the north side of the road, 0.4 miles.

M5 begins at the intersection of CSAH 10 and Township Road 128. The route alignment follows the north side of CSAH until it turns north along the west side of CSAH 21. The segment continues north for four miles and ends at County Road 71.

M7 continues north from County Road 71 along CSAH 21 for 9.5 miles where it will interconnect at the new Johnson Junction Substation.

M9 and M10 are approximately three miles long. The route alignment heads east from the new Johnson Junction Substation and will follow the half section along the existing 115 kV transmission line ROW to the Big Stone/Stevens County Line.

M17 continues east from Big Stone/Stevens County Line for 12.5 miles along the existing 115 kV transmission line, terminating at the Morris Substation.

3.4.1.2 Morris Route 2 Description

M1 begins at the Minnesota/South Dakota border and follows an existing 115 kV transmission line ROW, which crosses the Minnesota River. The route alignment then crosses MN Highway 7 and the segment ends at the top of the hill.

M2 begins on the east side MN Highway 7 and continues east for 1.5 miles where it turns north, crosses U.S. Highway 12 and Township Road 135 until County State Aid Highway (CSAH) 12. At this point the segment turns northeast following CSAH 12 for approximately 0.6 miles.

M4 continues northwest along the western edge of a WPA for one mile until County Road 65. At this point the segment follows County Road 65 for 1.1 miles, then turns east at the half section line of Section 24 for one mile until Township Road 130. The segment then follows Township Road 130 north for 0.5 miles then turns east along CSAH 10 for 1.25 miles until CSAH 12.

M6 continues north following Township Road 128 on the east side for 3.75 miles until Co. Rd. 71. It follows Co. Rd. 71 east then north the east again for 1.25 miles until CSAH 21.

M8 begins at CSAH 21 and follows Co. Rd. 71 for one mile east. At this point, the segment turns north along Township Road 84 for 9.5 miles. The segment runs adjacent to a WPA for one mile and the Freed WMA for 1,900 feet. The segment ends at the existing 115 kV transmission line to Morris.

M11 begins at the existing 115 kV transmission line and follows Township Road 84 north for 0.5 miles until MN Highway 28 and continues north cross-country for 0.5 miles along the east edge of Johnson, Minnesota. The segment ends at an abandoned railroad ROW.

M13 continues north cross-country for 0.75 to the Big Stone/Traverse County Line.

M14 follows the south side of the Big Stone/Traverse County Line east for one mile.

M18 follows the south side of the Big Stone/Traverse County Line east for 11 miles to the Morris Substation.

3.4.2 WILLMAR TRANSMISSION LINE

3.4.2.1 Willmar Route 1 Description

G-W begins at the Minnesota/South Dakota border and follows an existing 115 kV transmission line ROW, which crosses the Minnesota River and ends at MN Highway 7/U.S. Highway 75.

W2 follows MN Highway 7/U.S. Highway 75 SE the east for 6.5 miles.

W3 continues along CSAH 14 for 3.2 miles. The segment then turns north at the half-section for one mile cross-country, then turns east and follows 30th St SW (Swift County) for 9.9 miles until U.S. Highway 12. This section is adjacent to one WPA for 0.5 miles in Section 13 in Big Stone County. W3 continues east following U.S. Highway 12 on the south side for 6.6 miles until U.S. Highway 59.

W5A continues east along U.S. Highway 12 for three miles until CSAH 38.

W5B continues east following U.S. Highway 12 for three miles until turning south at CSAH 13 for one mile.

W6 continues east following CSAH 14 for 4.8 miles. The segment ends at the intersection with an existing 115 kV transmission line and is adjacent to the Clair Rollings WMA.

W7 begins at the existing 115 kV transmission line and continues east along CSAH 14 for 3.1 miles

W9 continues east along CSAH 14 for six miles, then turns south cross-country for one mile at the Torning/Kildare Township Line. At CSAH 10, the segment turns east for 2.2 miles until U.S. Highway 12. At this point the segment follows U.S. Highway 12 SE for 1.9 miles, turning east for 2.6 miles along the Kildare/Dublin Twp Line. The segment then turns south for 1.5 miles, east cross-country for 1.5 miles, then south for 0.5 miles, then east for 2.5 miles until Co. Rd. 89.

W12A continues east for 0.5 miles along 80th St NW, then turns south cross-country for one mile, then along 165th Ave for 1.5 miles until U.S. Highway 12. The segment then turns east along U.S. Highway 12 for 0.5 miles, then south along 170th Ave for 1.25 miles. The segment then crosses into Chippewa County and continues south for 4.5 miles.

W12B turns east cross-country for one mile.

W15 continues east cross-country for 0.5 miles

W16 continues east cross-country for almost two miles, and then follows the south side of MN Highway 23 for 2.5 miles until turning south for 0.5 miles and into the Willmar Substation.

3.4.2.2 Willmar Route 2 Description

G-W begins at the Minnesota/South Dakota border and follows an existing 115 kV transmission line ROW, which crosses the Minnesota River and ends at MN Highway 7/U.S. Highway 75.

W1A follows the existing Ortonville-Morris 115 kV transmission line east for 1.5 miles. The segment continues east cross-country for 1.5 miles, then south for 0.5 miles along County Road 67. The segment then turns east for two miles running adjacent to a WPA. The segment then turns south along CSAH 21 for 0.5 miles, then east cross-country for two miles running south of a WPA. At Township Road 122 the segment turns north for one mile, then east cross-country along the half-section for six miles until CSAH 25. At CSAH 25, the segment turns north for 0.5 miles to U.S. Highway 12 and continues on the south side of U.S. Highway 12 into Swift County for 4.5 miles. As U.S. Highway 12 veers southeast, the segment continues east along 40th St SW for 6.5 miles. The segment then turns south for 0.5 miles then east cross-country for three miles, then south for 0.5 miles along 140th Ave SW ending at U.S. Highway 12.

W19B continues south along the west side of 140th Ave SW for one mile, then east along 20th St SW for one mile until CSAH 38/130th Ave SW.

W20 continues south along CSAH 38, crossing the BNSF railroad tracks in Section 19. The segment continues south along Co. Rd. 61 for 2.9 miles.

W21 continues south along Co. Rd. 61 for 1.5 miles until CSAH 6. At CSAH 6 the segment turns east for 13 miles.

W22 continues east along CSAH 6 for four miles then turns south at Co. Rd. 83 for two miles, then turns east for one mile along 110th St SW and three miles east cross-country ending at 90th Ave.

W23 continues east cross-country for one mile then follows 110th St SW for one mile, then east cross-country for 2.5 miles, then south cross-country for three miles on the half section.

W24 continues south cross-country on the half section line for 2.5 miles until is intersects with an existing 69 kV transmission line.

W29 continues east along the existing 69 kV transmission line for 3.5 miles. The Sena WMA is adjacent to this segment for 0.5 miles in Section 26.

W12B continues east cross-country for one mile to the Chippewa/Kandiyohi County Line.

W14 follows the Chippewa/Kandiyohi County Line south for 0.5 miles then turns east at 45th Ave SW for one mile. The segment then turns south along 135th St SW for one mile, then east along 60th Ave SW for four miles until MN Highway 23.

W17 follows 60th Ave SW east for 4.25 miles until it intersects with the Granite Falls to Willmar 230 kV transmission line.

W18 follows the existing 230 kV transmission line northeast and north for 1.25 miles into the Willmar Substation.

3.4.3 GRANITE FALLS TRANSMISSION LINE

3.4.3.1 Granite Falls Routes 1 and 3 Descriptions (Preferred Route)

Routes 1 and 3 differ in the location where the routes cross the Minnesota/South Dakota border. The two routes are common beginning in Section 1 of Florida Township. The environmental analysis includes a discussion of each route separately until the routes join in Florida Township. The remainder of each route is discussed in the Environmental Analysis as "Routes 1 and 3" for the analysis since the routes are the same to the Granite Falls Substation.

Route 1 (Preferred Route)

G14 continues south in Minnesota along the Minnesota/South Dakota Border for 1.2 miles ending just before the residence on the east side of the road.

G15A angles SE across a farm field to the Las qui Parle/Yellow Medicine County Line. The segment then turns east along the county line for 4.3 miles ending at CSAH 9.

Route 3

G59 follows the Minnesota/South Dakota border south for 1.6 miles on the Minnesota side, then turns east 1,320 feet from the section line and goes east for 1.8 miles, then turns south along CSAH 7 for 1.8 miles.

G61 continues south along CSAH 7 1.5 miles to CSAH 30, then turns east along CSAH 30 for 0.5 miles until the half section line.

G63 follows the half section line south cross-country for nine miles ending at MN Highway 40.

G65 continues south along the half section line cross-country for one mile, along 141st Ave for one mile and cross-country again for one mile ending at 210th St.

G67 continues south along the half section line cross-country for two miles ending at U.S. Highway 212.

G69 continues south along the half section line cross-country for three miles ending at CSAH 12.

G70 jogs west along CSAH 12 for 1,320, turns south along the half section line for two miles until 140th St. At this point, the segment turns east for one mile, south cross-country for two miles. The segment turns east along Co. Rd. 50 for two miles then south along CSAH 9 for one mile.

Routes 1 and 3 (Preferred Route)

G15B follows CSAH 14 south for 0.5 miles.

G17 continues south for 0.5 miles along CSAH 14.

G21 continues south for 2.5 miles along CSAH 14, turns east along the half section line for 0.5 miles until it interescts and existing 115 kV transmission line.

G30 continues east cross-country along the half section line for 2.25 miles.

G31 continues east along the existing 115 kV transmission line for 3.6 miles.

G32 continues south along the existing 115 kV transmission line for one mile and into the Canby Substation.

G39 continues east along the existing 115 kV transmission line for 8.7 miles ending at the intersection with an existing 69 kV transmission line.

G45 continues east along the existing 115 kV transmission line for 16 miles. The segment passes adjacent to the Omro WMA for 2,000 feet and passes through the Lanners WMA for 1,600 feet.

G49 continues east along the existing 115 kV transmission line for four miles to 500th Street.

G50 continues east along the existing transmission line for one mile. At this point the proposed transmission line will change to 230 kV and continue north along the existing transmission line for 3.5 miles until County Road 67. The segment then follows the existing transmission line and County Road 67 for 0.5 miles, and then follows the existing transmission line east for 0.5 miles, north for 2.1 miles, and east across the Minnesota River for 0.75 miles into the Granite Falls Substation.

3.4.3.2 Granite Falls Routes 2 and 4 Descriptions

Routes 2 and 4 differ in the location where the routes cross the Minnesota/South Dakota border. The two routes are common beginning in Section 7 of Florida Township. The environmental analysis includes a discussion of each route separately until the routes join in Florida Township. The remainder of each route is discussed in the Environmental Analysis as "Routes 2 and 4" for the analysis since the routes are the same to the Granite Falls Substation.

Route 2

G14 continues south in Minnesota along the Minnesota/South Dakota Border for 1.2 miles ending just before the residence on the east side of the road.

G16 continues south along the Minnesota/South Dakota border for 0.75 miles to the half section line of Section 4. At this point, the segment turns east for 0.5 miles, south along 111th Ave for 0.5 miles and east along CSAH 14 for four miles.

G20 continues east along CSAH 4 for one mile.

G23 continues east along CSAH 4 for 1.5 miles

Route 4

G54 begins at the Minnesota/South Dakota border and goes east along 380th Street for one mile, south for 0.5 miles along 111th Ave, east cross-country at the half section line for three miles until Co. Rd. 51. At this point the segment turns south along Co. Rd. 51 for three miles.

G55 continues south along CSAH 3 for 6.5 miles. The segment continues south along an existing 69 kV transmission line, then follows 141st Ave for three miles.

G56 continues south along the 69 kV transmission line for three miles.

G57 follows the existing 69 kV transmission line south for two miles.

G58 follows the existing 69 kV transmission line south for two miles, east for two miles, then south for one mile. At this point the segment continues south cross-country on the half section line for five miles. At CSAH 4, the segment turns east for 0.5 miles then south along 167th Ave for one mile and into Yellow Medicine County along Co. Rd E2 for one mile.

Routes 2 and 4

G24 follows Co. Rd. E2 south for 0.5 miles, then east cross-country for one mile at the half section line.

G26 continues east cross-country along the half section line for one mile until CSAH 13.

G27 follows CSAH 13 south for 0.5 miles then east along 260th Ave for one mile to 200th St.

G29 continues along 260th Ave for 1.5 miles then turns south cross-country for 1.5 miles ending at an existing 115 kV transmission line.

G32 continues south along the existing 115 kV transmission line for one mile and into the Canby Substation.

G34 follows the existing 115 kV transmission line NE out of the Canby Substation for 0.75 miles.

G38 continues east for two miles along 240th Ave.

G42 continues east for six miles along 240th Ave ending at an existing 69 kV transmission line.

G44 follows Co. Rd. 11 and the existing 69 kV transmission line south for 0.5 miles.

G46 continues along Co. Rd. 11 and the 69 kV transmission line for 0.5 miles and follows the 69 kV transmission line east for one mile then south for one mile. The segment then turns east along CSAH 3 and continues for 15 miles ending at an existing 115 kV transmission line.

G47 follows the existing 115 kV transmission line north for one mile.

G48 follows the 230th Ave east for four miles, then turns north for 0.5 miles. At this point, the proposed transmission line will change to 230 kV.

G51 follows 500th St north for 3.5 miles until County Road 67. The segment continues north cross-country for one mil then turns east along 280th Ave for one mile, then north along 510th St for 0.5 miles.

G52 follows the existing 115 kV transmission line east for one mile, northeast for 1.8 miles and east for 0.5 miles.

G53 follows the existing 115 kV transmission line across the Minnesota River and into the Granite Falls Substation (0.75 miles).

3.4.4 ENGINEERING SUMMARY

The Applicants prefer H-frame structures for the Project; however, detailed engineering analysis still needs to be conducted. The Morris 230 kV transmission line span averages 700 feet between each structure and will be approximately 70 and 100 feet in height. The Granite Falls 345 kV transmission line span averages 800 feet between each structure and will be approximately 80 and 120 feet in height. The conductor will be 1272 Aluminum Conductor Steel Reinforced (ACSR) or 954 Aluminum Conductor Steel Supported (ACSS) for the Morris 230 kV transmission line and bundled 1272 ACSR or bundled 954 ACSS for the Granite Falls 345 kV transmission line. The final selection of conductor will be determined through additional engineering studies. The ROW proposed for the Morris 230 kV transmission line is 125 feet, whereas the Granite Falls 345 kV transmission line will be 150 feet.

3.5 ASSOCIATED FACILITIES

The description of Associated Facilities below includes the modifications to the system based on the studies that have been conducted for the Project. These modifications were determined by coordinating with regional load serving needs. Additional studies are being completed in the Willmar area to identify potential additional facility upgrades. If a transmission line is constructed to the Willmar Substation, it will be coordinated with the other regional load serving projects in the area.

MISO studies currently underway for the Project are being performed with the assumption that both lines associated with each transmission alternative are operated at 230 kV. Subsequent studies will be performed with the Big Stone 345 kV Substation to Granite Falls Substation operated at 345 kV. Through this subsequent analysis, there is a possibility that additional system upgrades will be identified due to this "southern" line being operated at 345 kV. These system upgrades are not known at this time and therefore specific improvements to the system are not yet known. Any and all system upgrades triggered by this subsequent analysis will be coordinated with neighboring transmission owners and through the appropriate regulatory processes.

Based on the study work that has been completed to date, it is believed that the basic interconnection facilities required for the Project are reasonably defined considering the fact that one of the two interconnections alternatives will be implemented. However, there could be other system improvements ("delivery related improvements") that may be required, as identified by the system impact study currently underway by MISO. It would be expected that the "delivery related improvements" would likely involve the following types of improvements to existing facilities:

- Replacement of existing transformers or circuit breakers at existing substation sites due to contingency overloads.
- Reconductor and insulator replacement of existing transmission lines due to contingency overloads.
- Improvements in existing substations to alleviate beaker overloads and to accommodate other improvements.

Environmental impacts for these "delivery related improvements" are not known at this time since the specific improvements are not known. It is anticipated that environmental impacts will be limited to construction impacts at existing substation sites and existing transmission line ROWs.

3.5.1 SUBSTATIONS

3.5.1.1 Johnson Junction Switch Station Modifications

The existing Johnson Junction Switch Station is located 25 miles north of Ortonville in the east half of Section 9, Township 124N, Range 45W of Big Stone County, Minnesota. The switch station is owned by GRE. A new substation to accommodate the Morris 230 kV transmission line from the Big Stone 230 kV Substation will be constructed adjacent to the switch station. The new Johnson Junction Substation will require the following equipment:

- 3-breaker ring-bus
- 3-phase 230/115 kV transformer
- 115 kV breaker
- control house for relaying
- fencing to enclose the substation yard

To allow for construction of the substation while the existing switching station remains energized, location of the additional equipment is planned directly south of the existing fenced area. To accommodate the new equipment, an area approximately 400 feet by 400 feet (3.67 acres) will be graded, and concrete footings for the electrical equipment and a gravel pad will be constructed. The Applicants propose purchasing approximately five acres of land south of the existing property. Appendix E.1 identifies the existing Johnson Junction Switch Station layout and the proposed expansion area.

3.5.1.2 Morris Substation Modifications

The existing Morris 230 kV Substation is located west of Morris in the SE ¼ of the SW ¼ of Section 36, Township 124, Range 43W in Stevens County, Minnesota. The substation has one 3-phase 230/115 kV transformer and one 3-phase 115/41.6 kV transformer. The Morris 230 kV Substation is owned and operated by Western, and any modifications to this station are within their jurisdiction. Planned modifications include a new 230 kV transmission line-termination, a breaker with associated switches and transmission line relaying equipment. Additionally, the current 230/115 kV transformer will likely be replaced with a larger unit. The existing substation has adequate space for these additions and no expansion is anticipated.

3.5.1.3 Willmar Substation Modifications

The existing Willmar 230 kV Substation is located in Willmar in the SE ¼ of the SW ¼ of Section 27, Township 119, Range 35, in Kandiyohi County. The City of Willmar and GRE currently share ownership of this facility. The existing facility has one 3-phase 230/69 kV transformer and one 3-phase 115/69 kV transformer. Modifications to this facility to accommodate the proposed new 230 kV transmission line are as follows:

- Install a parallel 230/69 kV transformer by replacing the existing 115/69 kV transformer with a new 230/69 kV transformer
- Construct a breaker and a half scheme to accommodate the new transformer and associated equipment

These modifications will require that the site be expanded to the northwest of the facility. The expansion is estimated at approximately 250 feet by 250 feet (1.5 acres) and will require grading and installation of concrete footings and a gravel pad. Approximately three acres of land will be purchased for the proposed expansion. Appendix E.2 identifies the existing Willmar Substation layout and the proposed expansion area.

3.5.1.4 Canby Substation Modifications

The existing Canby 115/41.6 kV Substation is located north of Canby in the SW ¼ and NW ¼ of Section 25, Township 115, Range 45, in Yellow Medicine County. The Canby 115/41.6 kV Substation is owned and operated by Otter Tail. The facility has one 3-phase 115/41.6 kV transformer. Modifications to the substation will include the following:

- Installation of a new 230 kV 3 position ring-bus with transmission line terminations for the Big Stone and Granite Falls lines,
- Installation of a new 3-phase 230/115kv transformer.
- Expansion of the existing control house or construction of a new control house to accommodate the necessary control and relaying equipment for the new transmission line.

As much of the 230 kV 3-position ring-bus will be constructed with 345 kV-rated equipment as practicable to accommodate the future 345/115 kV transformer that will replace the 230/115 kV transformer when the Granite Falls 345 kV transmission line is energized at 345 kV.

These modifications will require that the site be expanded to the south or east of the existing facility. The expansion is estimated at approximately 500 feet by 550 feet (6.3 acres) and will require grading and installation of concrete footings and a gravel pad. The Applicants proposed to purchase approximately eight acres of land to accommodate this expansion. Appendix E.3 identifies the existing Canby Substation layout and the proposed expansion area.

3.5.1.5 Granite Falls Substation Modifications

The existing Granite Falls 230 kV Substation is located north of Granite Falls in the SW ¼ of the NE ¼ of Section 28, Township 116N, Range 39W. The Granite Falls 230 kV Substation is owned and operated by Western. The substation includes one 3-phase 230/69 kV transformer and one 3-phase 115/69 kV transformer. Modifications to this substation include a new 230 kV transmission line termination, a breaker with associated switches and transmission line relaying equipment. The substation has adequate space to accommodate the modification associated with the Project. It is anticipated that Western will design and construct these modifications within the existing footprint of the substation.

3.5.2 TRANSMISSION LINE MODIFICATIONS

3.5.2.1 Ortonvile Substation 115 kV Transmission Line Removal

3.5.2.2 Morris 115 kV Transmission Line Rebuild

The existing 115 kV transmission line from Big Stone 230 kV Substation to Morris Substation will require a rebuild if the Willmar alternative is selected. It is anticipated that the rebuild will follow the existing transmission line ROW from the Minnesota/South Dakota border, in and out of the Ortonville Substation to the Morris Substation and will be a structure for structure replacement of the existing transmission line, to the extent practicable. If this associated facility is built, the 1.2-mile section into the Ortonville Substation that is planned for removal under the Morris alternative will remain as part of the 115 kV transmission line rebuild (Appendix B.1 and Appendix F.2). There are currently three parallel 115 kV transmission lines into the Ortonville Substation, two of which will be rebuilt as part of the 115 kV transmission line upgrade to the Morris Substation.

3.6 ESTIMATED COSTS

The project costs for the preferred routes are estimated at $41.4 to $50.2 million. Appendix D provides a breakdown of the estimated transmission line construction costs and substation modification costs. A more specific breakdown of project cost for each alternative segment considered is included in Appendix D.

Costs for the proposed transmission line construction and upgrades were calculated using a per-mile estimate for the different transmission line structure types, and the estimate includes material, engineering and survey costs. ROW costs, in addition to salvage costs (structure removal), were also considered in determining the approximate cost for the transmission line construction. Substation costs also include materials, engineering and survey costs, but do not include ROW site acquisition costs.

Annual operation and maintenance costs are estimated at approximately $30,000 and are dependent on setting, amount of vegetation management necessary, storm damage occurrences, structure types, age of the line, etc. The annual substation operation and maintenance costs are approximately $10,000-$15,000 per substation. It is anticipated that very little maintenance will be required for the first several years since the transmission line will be new.

Transmission Line Construction Costs

Corridor Options	Route Alternatives	Transmission Line Costs ($ Million) (H-frame) (low)	Transmission Line Costs ($ Million) (H-frame) (high)	Transmission Line Costs ($ Million) (Single Structure) (low)	ROW Costs ($ Million) (low)	ROW Costs ($ Million) (high)	Structure Removal Costs ($ Million)	Total Cost ($ Million) (Range)
Morris	Morris Route 1	$11.1	$12.2	$12.5	$1.2	$2.4	$3.5	$15.8-$18.4
	Morris Route 2	$11.6	$12.8	$13.1	$1.7	$2.5	$1.1	$14.4-$16.7
Willmar	Willmar Route 1	$21.6	$23.7	$24.3	$3.0	$4.7	-	$24.7-$29
	Willmar Route 2	$24.2	$26.6	$27.3	$3.5	$5.3	-	$27.7-$32.6
Granite Falls	Granite Falls Route 1	$22.6	$28.8	$19.1	$2.2	$3.4	$3.5	$24.8-$35.7[1]
	Granite Falls Route 2	$22.9	$30.6	$20.6	$2.4	$3.6	$1.7	$28.7-$34.9[1]
	Granite Falls Route 3	$32.0	$42.8	$31.5	$3.3	$5.0	$3.5	$38.3-$51.3[1]
	Granite Falls Route 4	$33.2	$44.4	$33.0	$3.5	$5.2	$0.7	$37.2-$50.3[1]

[1]*Includes $4-$6 million in 230 kV transmission line costs for the Hazel to the Granite Falls portion of the route.*

Substation Modifications

Location	Costs
Johnson Junction Substation Construction	$4,000,000
Morris Substation Modifications	$3,500,000[1]
Willmar Substation Modifications	$3,500,000
Canby Substation Modifications	$5,000,000
Granite Falls Substation Modifications	$750,000[1]

[1] *These costs are estimates based on typical costs from past projects. Improvements at these substations are subject to Western's jurisdiction.*

Overall Estimated Project Costs

System Alternative	Routes	Transmission Line Costs	Substation Costs	Total Costs
Alternative 1	Morris Route 1 + Granite Falls Route 1 (Preferred Routes)	$41-$54.1	$13.3	$54.3-$67.4
Alternative 1	Morris Route 1 + Granite Falls Route 2	$39.9-$53.3	$13.3	$53.2-$66.6

System Alternative	Routes	Transmission Line Costs	Substation Costs	Total Costs
Alternative 1	Morris Route 1 + Granite Falls Route 3	$54.5-$69.7	$13.3	$67.8-$83
Alternative 1	Morris Route 1 + Granite Falls Route 4	$53.4-$68.7	$13.3	$66.7-$82
Alternative 1	Morris Route 2 + Granite Falls Route 1	$40-$52.4	$13.3	$53.3-$65.7
Alternative 1	Morris Route 2 + Granite Falls Route 2	$43.9-$51.6	$13.3	$57.2-$64.9
Alternative 1	Morris Route 2 + Granite Falls Route 3	$53.5-$68	$13.3	$66.8-$81.3
Alternative 1	Morris Route 2 + Granite Falls Route 4	$52.4-$67	$13.3	$65.7-$80.3
Alternative 2	Willmar Route 1 + Granite Falls Route 1	$49.5-$64.7	$9.3	$58.8-$74
Alternative 2	Willmar Route 1 + Granite Falls Route 2	$53.4-$63.9	$9.3	$62.7-$73.2
Alternative 2	Willmar Route 1 + Granite Falls Route 3	$63-$80.3	$9.3	$72.3-$89.6
Alternative 2	Willmar Route 1 + Granite Falls Route 4	$61.9-$79.3	$9.3	$71.2-$88.6
Alternative 2	Willmar Route 2 + Granite Falls Route 1	$52.5-$68.3	$9.3	$61.8-$77.6
Alternative 2	Willmar Route 2 + Granite Falls Route 2	$56.4-$67.5	$9.3	$65.7-$76.8
Alternative 2	Willmar Route 2 + Granite Falls Route 3	$66-$83.9	$9.3	$75.3-$93.2
Alternative 2	Willmar Route 2 + Granite Falls Route 4	$64.9-$82.9	$9.3	$74.2-$92.2

3.7 PROJECT SCHEDULE

The Applicants require an in service date of March 2009 for the Granite Falls 345 kV transmission line and June 2010 for the Morris 230 kV transmission line to meet the commercial operation date of the generation facility (Spring 2011). The Applicants expect the PUC will issue a route permit in the Fall of 2006. Project construction is slated to commence in March 2007 and would begin with the Granite Falls 345 kV transmission line. The Record of Decision (ROD) for the Federal EIS is expected in November 2006.

4.0 ENGINEERING DESIGN, CONSTRUCTION AND RIGHT-OF-WAY ACQUISITION

4.1 TRANSMISSION LINE ENGINEERING AND OPERATIONAL DESIGN

4.1.1 TRANSMISSION STRUCTURE DESIGN AND RIGHT-OF-WAY

The Applicants' preference, at this point in time, is to construct the transmission line using H-frame 230 kV and 345 kV structures. These structures will be direct imbedded, which requires a hole to be dug to accommodate the structure, which is then backfilled with aggregate and soil. The hole for the structure will be approximately 3 to 4 feet in diameter and between 9 to 14 feet deep. The Morris 230 kV transmission line span averages 700 feet between each structure and will be between 70 and 100 feet in height. However, the final structure type and construction methodology will be based on the final design and economical analysis. The Granite Falls 345 kV transmission line span averages 800 feet between each structure and will be between 80 and 120 feet in height. The conductor proposed for each phase of the transmission line has not yet been decided. A detailed engineering study needs to be performed to determine the optimal size of conductors to use on the various transmission lines associated with the. At this point in time, it appears that 1272 ACSR or 954 ACSS may be desired on the Morris 230 kV transmission lines and either bundled 1272 ACSR or bundled 954 ACSS may be desired on the Granite Falls 345 kV transmission lines. Each separate portion of transmission line associated with the Project is identified below with the possible conductor size and type based on the information available to date. The selection of the optimal conductors on each transmission line will depend on a number of factors, such as losses, construction costs and aesthetics.

The conductors being considered for each route alternative are as follows:

Route	Conductor Types
Morris Routes 1 and 2	1272 ACSR or 954 ACSS
Willmar Routes 1 and 2	1272 ACSR or 954 ACSS
Granite Falls Routes 1-4	Bundled 1272 ACSR or bundled 954 ACSS for the 345 kV transmission line initially operated at 230 kV 1272 ACSR or 954 ACSS for 230 kV from Hazel Township to Granite Falls Substation

Appendix C.2 identifies the typical 230 kV H-frame structures that will be used for the Morris or Willmar transmission lines. The Granite Falls transmission line will utilize the typical 345 kV H-frame structures as depicted in Appendix C.3 and Appendix C.4. Preliminary engineering studies indicate that H-frame structures are the preferred structure type, at this time, for the Project. The Granite Falls 345 kV transmission line structures will be slightly taller than the 230 kV transmission line structures used for the Morris or Willmar transmission lines; the insulators will be longer than the 230 kV transmission line. A double circuit 230 kV/115 kV transmission line structure will be necessary in Ortonville, crossing the Minnesota River, and west of Willmar near the Pennock Substation. Appendix C.5 – Appendix C.7 identifies a typical 230 kV/115 kV transmission line structure. Single circuit structures were considered for the 230 kV and 345 kV transmission lines and are depicted in Appendix C.8 and Appendix C.9.

Corner structures will either be on concrete foundations or will be direct imbed with guy wires and will vary based on soil types and route angles. Special structures may also be utilized in areas where long spans or special circumstances, such as wetland or avian issues, arise.

The ROW required for 230 kV structures is 125 feet, whereas the 345 kV structures require 150 feet of ROW. Appendix C.10 and Appendix C.11 identify ROW requirements when a 230 kV transmission line is paralleling roads/existing ROW, and Appendix C.12 and Appendix C.13 represent a 345 kV transmission line when it is routed cross-country.

4.1.2 DESIGN OPTIONS TO ACCOMMODATE FUTURE EXPANSION

Due to the large number of regional planning studies occurring in the region, the Applicants have studied how the Project, in the context of regional planning efforts, will affect the transmission system. To the extent practicable, the Applicants have incorporated design options to accommodate the identified plans in these regional studies. These options include constructing the transmission line from the future Big Stone 345 kV Substation to the eastern edge of Hazel Run Township at 345 kV capability, incorporating generation capacity anticipated in the region into conductor design options and designing substations to accommodate future generation capacity in the region.

The decision to construct the Granite Falls transmission line at 345 kV and not 230 kV was in response to regional planning efforts. There are several regional planning studies, such as Capital Expenditures by the Year 2020 (CapX 2020), Northwest Exploratory Study, Buffalo Ridge Incremental Generation Outlet (BRIGO) and Southwest Minnesota → Twin Cities Electric High Voltage (SW MN → TC EHV) Study, being conducted by regional utilities and Midwest Independent System Operator (MISO). Given the results of these studies, the addition of a 345 kV transmission line between the Big Stone and Granite Falls substations helps meet the growing need for transmission capacity in the western and southwestern portion of Minnesota, as well as neighboring states. Additionally, it fits into the regional transmission plan for Minnesota and will help support future independent transmission projects in the State, in particular a 345 kV transmission line planned to connect the Buffalo Ridge area with the Twin Cities metro area (as identified in the SW MN → TC EHV Study).

The Applicants considered whether a 345 kV transmission line was warranted to either Willmar or Morris. Regional study efforts have not shown the need for a 345 kV transmission line to either Willmar or Morris, therefore, the Applicants feel that there is not sufficient evidence to warrant building a transmission line of that size to either location.

A MISO interconnection study was completed for the Project and was attached as Appendix B in the CON. The MISO interconnection study assumed that the new Morris 230 kV transmission lines associated with the Project were composed of 954 ACSR conductors. Through the study, it was determined that this conductor did not provide enough capacity for the Project. The size of the conductors used on the 230 kV transmission lines will need to be larger than 954 ACSR in order to reliably deliver the power from BSP II to the HVTL system. A detailed engineering study needs to be performed to determine the optimal size of conductors to use on the various transmission lines associated with the Project. Preliminary results of conductor size are discussed in Section 4.1.1. Regardless of the conductor size selected for each portion of the Project, it is anticipated that the selected conductors will have enough capacity to accommodate the life of BSP II. This capacity will be sufficient when BSP II initially goes on-line, as well as if additional capacity is needed in the future due to turbine upgrades at the plant or other generation-related upgrades to allow for more output from BSP II.

However, when the models of the MISO interconnection study were prepared, they included potential generation projects ahead of BSP II. The amount of generation from the Buffalo Ridge area built into the model was approximately 1,700 (MW), but regulatory approval for transmission system expansion has only been granted to accommodate up to 825 MW of generation to date. As a result, the assumptions in the study overestimated the amount of capacity needed for BSP II to be in service. Some of the projects incorporated in the model have dropped out of the queue. Therefore, it is anticipated that the once the Project is constructed there will be extra transmission capacity in the system for additional generation projects in the region.

Also, the coordination of the Project with the SW MN → TC EHV study has provided valuable information about the amount of capacity necessary on the proposed transmission line from Canby to Hazel Run and from Hazel Run to Granite Falls to avoid future transmission constraints with the addition of new generation in the Buffalo Ridge area. As a result, the Applicants feel they have adequately considered the regional plans into the Project and will be sizing the proposed additions to the transmission system to accommodate future expansion.

Based on regional planning efforts, such as the SW MN → TC EHV study and BRIGO, it is apparent that the Project has the ability to facilitate generation plans in the Buffalo Ridge area. Therefore, it is necessary to account for future independent projects that may affect the transmission system. Based on the assumptions used during these two aforementioned studies, the Applicants have decided to size the transformer at the Canby Substation large enough to handle the increased generation levels anticipated from the Buffalo Ridge area.

4.2 IDENTIFICATION OF EXISTING UTILITY AND PUBLIC RIGHTS-OF-WAY

As discussed in Section 5.3, the use of existing utility and public ROWs was considered in selection of the routes for the Project. By utilizing existing ROWs, the Applicants are able to decrease the impacts of the new transmission line by either sharing ROW with existing facilities, or utilizing a portion of what is existing in the built environment. Table 3 provides a summary of the corridor sharing along the route alignments.

TABLE 3
SUMMARY OF CORRIDOR SHARING ALONG ROUTE ALIGNMENTS

System Alternative	Routes	Route Length	Transmission Line Corridor Sharing (miles)	Road and Railroad Corridor Sharing (miles)	Total Corridor Length Shared (miles)[1]	No Corridor Sharing (miles)	Percentage of Total Route Length Shared
Alternative 1	Morris Route 1	40.2	40.1	29.8	40.1	0.2	99.7
	Morris Route 2	42.2	12.3	33.5	38.2	41.	90.5
Alternative 2	Willmar Route 1	78.5	15.5	61.0	67.7	10.7	86.3
	Willmar Route 2	88.0	7.6	57.1	64.7	23.2	73.5
Alternatives 1 and 2	Granite Falls Route 1	56.0	46.9	10.7	53.4	2.6	95.3
	Granite Falls Route 2	59.4	9.8	49.3	54.4	5.0	91.5
	Granite Falls Route 3	83.0	46.9	13.2	55.9	27.2	67.3
	Granite Falls Route 4	86.1	25.4	68.4	76.4	9.7	88.6

[1]The sum of the corridors shared with transmission line, road and railroad ROWs does not eaqual the total corridor length shared, since the routes often share more than one corridor.

The preferred routes will require approximately 660 acres of ROW for the Project. Approximately 97.2 percent of the preferred routes share ROW with existing corridors.

4.3 RIGHT-OF-WAY ACQUISITION, CONSTRUCTION, RESTORATION AND MAINTENANCE PROCEDURES

4.3.1 RIGHT-OF-WAY ACQUISITION

4.3.1.1 Transmission Line Property Acquisition Procedures

Following issuance of a Route Permit, the Applicants will begin the process of acquiring easements for the location and construction of the new transmission line. The ROW representative will complete a search of the public records of all lands involved in the Project. A title report will be developed to determine the legal description of the property, the owner(s) of record of the property and information regarding easements, liens, restrictions, encumbrances and other conditions of record. The Applicants anticipate that a majority of the landowners have been notified of the Project due to the numerous public meetings held for the proposed facilities for Federal review and the State permitting processes. Additionally, these landowners will be provided information as the Project proceeds through the review and approval process with the State.

Once the individuals along the proposed facility have been identified, a ROW representative will contact each property owner or their representative to inform them of the Project. The ROW representative will describe the need for the transmission line and how it may affect their property. Once permission is granted, the Applicants' survey crews would then enter the property to complete the preliminary survey work and possibly soil investigations. As the design of the transmission line nears completion, the survey crews will stake the structure or structure location. The ROW representative will show the landowner where the structure is located on their property and will discuss any location concerns.

During the acquisition process, the property on which the easement rights are to be acquired will be evaluated by the ROW agent to determine the amount of just compensation for the rights to be obtained. In the event that a complicated appraisal problem exists, or if a statutory requirement in the local jurisdiction dictates, an appraisal will be completed by the Applicants' representative to determine the value of the rights being acquired. The Applicants will make an offer to the owner to obtain the property rights.

A ROW representative will begin the negotiating process by presenting the required legal documents to the property owner. They will also provide maps of the transmission line route or site, maps showing the landowner's parcel and an offer of compensation of the easement or purchase. The landowner will be allowed a reasonable amount of time in which to consider the offer and to present material to the Applicants that the owner believes is relevant to determining the value of the property.

The representative will work closely with the landowner to try to arrive at a negotiated settlement that is fair and acceptable to all parties. In nearly all cases, the representatives are able to work with the landowners to address their concerns; however, in some cases a negotiated settlement is not possible and the landowner may choose to have an independent third party determine the value for the rights taken. This is accomplished through the exercise of the Right of Eminent Domain (condemnation) by the Applicants.

In any project that requires easements for transmission line construction, the goal is to offer fair and equitable compensation to landowners. Condemnation proceedings will only be initiated by the Applicants when reasonable efforts to negotiate an agreement at what is believed to be just compensation have failed.

Also, for the 345 kV transmission line portion of the Project, there may be instances where property is purchased by the Applicants per Minn. Stat. 116C.63, subd.4 (sometimes referred to as "Buy the Farm"). This allows the property owner the option of having the Applicants purchase the property that the transmission line crosses for the fair market value of the land. This option is the landowner's choice.

4.3.1.2 Substation Property Acquisition Procedures

The Applicants have not entered into negotiations on any parcels for substation expansion or construction. Once the necessary permits are issued, the Applicants will make contact with the appropriate landowners of the sites to discuss the Project in detail. The Applicants 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 Applicants will obtain land rights for the facilities and will seek to obtain the property through voluntary purchases.

As stated previously, no expansion of Western facilities is anticipated. Any expansion necessary would be under the jurisdictional authority of Western.

During the substation construction phase, any affected property owners will be advised of construction schedules or 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.

4.3.2 CONSTRUCTION PROCEDURES

4.3.2.1 Transmission Line Construction Procedures

Once access to the land is granted, site preparation begins in coordination with landowners. This includes clearing the ROW of vegetation that would interfere with the safe operation of the transmission line. Any vegetation that would prevent 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 Applicants 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 might be performed.

The Applicants have standard construction and mitigation practices that were developed from experience with past practices as well as industry-specific BMPs. These 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. Contractors are advised of these BMP requirements during the bid process. For facilities that will have the structures directly embedded in the ground, the structures will be erected by auguring or excavating a hole typically 10 to 15 feet deep and 3 to 4 feet in diameter for each structure. Any excess soil from the excavation will be offered to the landowner or removed from the site.

The steel or wood 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. Other facilities may require the use of concrete foundations. 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 12 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.

Steel structures are delivered to staging areas, located approximately every 25 miles along the route, which occupy approximately one acre of land. At each staging area, steel structure sections are connected, the arms are attached, and the structure is then loaded onto a structure trailer. The structure is delivered to the staked location and placed within the ROW until the structure is set. Insulators and other hardware are attached while the steel structure is on the ground. The structure is then lifted and placed in the ground for direct buried structures. Structures that cannot be direct buried are secured on the foundation by crane. In some cases temporary lay down areas may be required. These areas will be selected for their location, access, security and ability to efficiently and safely warehouse supplies. The areas are chosen so minimal excavation and grading is needed. The temporary lay down areas outside of the transmission line ROW will be obtained from affected landowners through rental agreements.

Wood structures are also delivered to staging areas. When the transmission line runs parallel with a roadway, wood structures may be placed at the staked location. This occurs when there is room to leave the structure and adequate access to drop off the structure until it is installed. When wood structures are located away from roadways, they are sorted at the staging area and loaded onto structure trailers for delivery to the staked location. Because the wood structures weigh less, several wood structures can be placed on the trailer for each delivery. Insulators and other hardware are attached to the structure while it is on the ground, then a line truck lifts and places it.

After structures have been erected, conductors are installed 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, the most effective means to minimize impacts to water areas will be to span all streams and rivers with structures. In addition, the Applicants 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.

4.3.2.2 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 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 then placed throughout the substation pad to support the substation equipment. A control house is constructed to house the 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 Applicants will provide erosion control methods to be implemented to minimize runoff during substation construction and since the projects will likely impact more than one acre, a National Pollutant Discharge Elimination System (NPDES) permit will be acquired, as necessary. Additionally, 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.

Contractors will be committed to safe working practices, maintaining property and equipment in safe working condition and requiring compliance with all applicable safety rules, practices and procedures. Substations will be designed in compliance with the applicable requirements of Rural Utilities Service (RUS), National Electrical Safety Code (NESC), Occupational Safety and Health (OSH) Act (29 CFR 1910) and local regulations. 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.

4.3.3 RESTORATION PROCEDURES

4.3.3.1 Transmission Line Restoration Procedures

During construction, limited ground disturbance at the structure sites may occur. The construction contractor establishes a main staging area for temporary storage of materials and equipment. 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.

Unless otherwise agreed upon by the landowner, all storage and construction buildings, including concrete footings and slabs and all construction materials and debris, will be removed from the site once construction is complete. Post-construction reclamation activities also 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.

Once construction is completed, landowners are contacted by the ROW agent 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 Applicants 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.

4.3.3.2 Substation Restoration Procedures

Upon completion of construction activities, the Applicants 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.

4.3.4 MAINTENANCE PROCEDURES

4.3.4.1 Transmission Line Maintenance Procedures

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 Applicants will inspect the transmission lines at least once each 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 Applicants' practice provides for the inspection of major transmission lines (230 kV and above) every year to determine if clearing is required. Other transmission lines are typically reviewed on a two-year cycle. 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 $30,000. 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 through tilled agricultural land with relatively little tree maintenance required. Structures will be new, so very little maintenance will be required for several years.

4.3.4.2 Substation Maintenance Procedures

Over the life of the substation, each substation owner or its designated representative will perform annual inspections for safety and will do quarterly inspections to maintain equipment and make necessary repairs. The appropriate party will also conduct routine maintenance, as required, to remove undesired vegetation that may interfere with the safe and reliable operation of the substation.

4.4 ELECTRIC AND MAGNETIC FIELDS

The EQB has addressed the matter of EMF with respect to new transmission lines in a number of separate dockets over the past few years. See 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 (EAs) 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.

Most recently, in June 2005, in Docket No. 03-73-TR-Xcel for the Buffalo Ridge 345 kV transmission line, the EQB made the following findings with regard to EMF:

> 118. No significant impacts on human health and safety are anticipated from the project. There is at present insufficient evidence to demonstrate a cause and effect relationship between EMF exposure and any adverse health effects. The EQB has not established limits on magnetic field exposure and there are no Federal or Minnesota health-based exposure standards for magnetic fields. There is uncertainty, however, concerning long-term health impacts, and the Minnesota Department of Health, the EQB and Xcel all recommend a "prudent avoidance" policy in which exposure is minimized.
>
> 119. In previous routing proceedings, the EQB has imposed a permit condition on HVTL permits limiting electric field exposure to 8 kV/m at one meter above ground. This permit condition was designed to prevent serious hazard from shocks when touching large objects, such as semi trailers or large farm equipment under extra high voltage transmission lines of 500 kV or greater. Predicted electric field densities are less than half of the 8 kV/m permit condition for both the 345 kV transmission line and the 115 kV transmission line.

> Other than the "prudent avoidance" standard widely accepted in Minnesota, there is no standard for magnetic field data as set forth in the Draft EIS (DEIS). In general, the data show that the strength of the magnetic field decreases rapidly as one moves away from the center line, and reaches approximate background levels about 300 feet or less from the transmission lines. According to Xcel Energy, the maximum calculated ground level magnetic field directly below the transmission line expected for the 345 kV transmission line when it is conducting electricity under average operating conditions is approximately 68 milligauss, and 113 milligauss at peak operating conditions. The maximum calculated ground level magnetic field expected for the 115 kV transmission line when it is conducting electricity under average operating conditions is approximately 87 milligauss directly below the line, and 146 milligauss at peak operating conditions. The only two states that have established standards are Florida (a 150 milligauss limit) and New York (a 200 milligauss limit). The maximum magnetic field expected from the two new lines is within those limits.
>
> *(Findings 118 and 119, Findings of Fact, Conclusions, and Order Issuing Route Permit for Construction of Two High Voltage Transmission Lines, One Substation, and Related Facilities, dated June 16, 2005, at 31, footnotes omitted.)*

While the general consensus is that electric fields pose no risk to humans, the question of whether exposure to magnetic fields potentially can cause biological responses or even health effects continues to be the subject of research and debate. In addressing this issue, the Applicants provide information on EMF to the public, interested customers and employees to assist them in making an informed decision about EMF. The Applicants will provide measurements for landowners, customers and employees who request them. In addition, The Applicants have followed the "prudent avoidance" guidance suggested by most public agencies. This includes using structure designs that minimize magnetic field levels and attempting to site facilities in locations with lower residential densities.

Below is a discussion of the predicted electric and magnetic fields for the Project. The closest residences to the rotues are summarized below in Table 4.

TABLE 4
NEAREST RESIDENCES TO ROUTE

Route	Distance (feet)
Morris Route 1	172.0
Morris Route 2	59.1
Willmar Route 1	82.0
Willmar Route 2	88.6
Granite Falls Route 1	328.1
Granite Falls Route 2	82.0
Granite Falls Route 3	114.8
Granite Falls Route 4	124.7

4.4.1 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 one meter).

The Granite Falls 345 kV transmission line will have a peak magnitude of electric field density of approximately 2.2 kV/m underneath the conductors, one meter above ground level. The peak electric field density for the Morris 230 kV transmission line will be approximately 1.5 kV/m (Table 5). 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 each type of conductor and associated transmission line voltage when operated at maximum capacity levels are shown in Table 5.

TABLE 5
PREDICTED ELECTRIC FIELDS FROM PROPOSED TRANSMISSION LINES 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
H-Frame, 230 kV transmission line with 954 ACSS	0.02	0.05	0.30	1.1	1.4	0.5	1.4	1.1	0.3	0.05	0.02
Single Pole Davit Arm, 230 kV transmission line with 954 ACSS	0.02	0.06	0.2	0.7	1.0	0.6	0.7	0.7	0.3	0.07	0.03
H-Frame, 230 kV transmission line with 1272 ACSR	0.02	0.05	0.3	1.1	1.5	0.5	1.5	1.1	0.3	0.05	0.02
Single Pole Davit Arm, 230 kV transmission line with 1272 ACSR	0.02	0.06	0.2	0.8	1.0	0.6	0.8	0.7	0.3	0.07	0.03
H-Frame, 345 kV transmission line with bundled 954 ACSS	0.04	0.1	0.7	1.5	1.5	0.3	1.5	1.5	0.7	0.1	0.04
Single Pole Davit Arm, 345 kV transmission line with bundled 954 ACSS	0.06	0.1	0.6	1.8	2.2	1.2	1.6	1.5	0.7	0.2	0.07
H-Frame, 345 kV transmission line with bundled 1272 ACSR	0.04	0.1	0.7	1.6	1.5	0.3	1.5	1.6	0.7	0.1	0.04
Single Pole Davit Arm, 345 kV transmission line with bundled 1272 ACSR	0.06	0.1	0.6	1.8	2.2	1.2	1.6	1.6	0.7	0.2	0.07
H-Frame, 345 kV transmission line operated at 230 kV with bundled 954 ACSS	0.03	0.09	0.4	1.0	1.0	0.2	1.0	1.0	0.4	0.09	0.03
Single Pole Davit Arm, 345 kV transmission line operated at 230 kV with bundled 954 ACSS	0.04	0.1	0.4	1.2	1.5	0.8	1.1	1.0	0.5	0.1	0.04
H-Frame, 345 kV transmission line operated at 230 kV with bundled 1272 ACSR	0.03	0.09	0.5	1.0	1.0	0.2	1.0	1.0	0.5	0.07	0.02
Single Pole Davit Arm, 345 kV transmission line operated at 230 kV with bundled 1272 ACSR	0.04	0.09	0.4	1.2	1.5	0.8	1.1	1.0	0.5	0.1	0.05

4.4.2 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).

The question of whether exposure to power-frequency [60 Hertz (Hz)] magnetic fields can cause biological responses or even health effects has been the subject of considerable research for the past three decades. The most recent and exhaustive reviews of the health effects from power-frequency fields conclude that the evidence of health risk is weak. The National Institute of Environmental Health Sciences (NIEHS) issued its final report, *NIEHS Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields,* on June 15, 1999, following six years of intensive research. NIEHS concluded that there is little scientific evidence correlating extra low frequency electromagnetic field (EMF) exposures with health risk.

The predicted magnetic fields for each conductor type and associated voltage are shown in Table 6. The predictions were calculated using the transmission line amperage maximum capacities. This conservatively over-predicts the magnetic fields that will be generated under normal operation. When the Granite Falls transmission line is energized from 230 kV to 345 kV a decrease in magnetic field generation is predicted, due to a decrease in the amperage carried by the conductor at the higher voltage level. The Granite Falls 345 kV transmission line will have peak magnetic field of approximately 250 milligauss. The peak magnetic field measurement for the Morris 230 kV transmission line will be approximately 212 milligauss.

TABLE 6
PREDICTED MAGNETIC FIELD FROM PROPOSED TRANSMISSION LINES OPERATED AT MAXIMUM CAPACITY (MILLIGAUSS)

Conductor Size	Distance from center of transmission line corridor (feet)								
	-300	-200	-100	-50	0	50	100	200	300
H-Frame, 230 kV transmission line with 954 ACSS	4.5	10	37	105	212	105	37	10	4.5
Single Pole, 230 kV transmission line with 954 ACSS	4.0	8.7	29	71	113	63	28	8.5	4.0
H-Frame, 230 kV transmission line with 1272 ACSR	3.3	7.2	26	75	152	75	26	7.2	3.3
Single Pole, 230 kV transmission line with 1272 ACSR	2.9	6.2	21	51	81	45	20	6.1	2.8
H-Frame, 345 kV transmission line with bundled 954 ACSS	9.8	21	71	160	250	160	71	21	9.8
Single Pole, 345 kV transmission line with bundled 954 ACSS	10	22	72	154	214	137	68	22	10
H-Frame, 345 kV transmission line with bundled 1272 ACSR	7.0	15	51	114	179	114	51	15	7.0
Single Pole, 345 kV transmission line with bundled 1272 ACSR	7.4	16	51	110	153	98	48	16	7.4

4.4.3 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, EMFs or earth currents. It only affects farm animals that are confined in areas of electrical use. It does not affect humans.

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.

4.5 TRANSMISSION LINE RELIABILITY

The PUC is currently evaluating which system alternative is the most reasonable and prudent configuration that would most reliably serve the purpose and need of the Project. The selection of the system alternative will dictate which of the proposed routes will be selected. The Applicants are presenting route options within each of the proposed corridors as mandated by the CON process and through the Federal EIS process in which transmission system improvements are designed to support electrical system reliability.

The Big Stone Plant currently has several existing transmission lines that exit the Big Stone 230 kV Substation and it appears that there would be an opportunity to double circuit some of the existing transmission lines with the proposed transmission lines from the Project. The North American Electric Reliability Council (NERC) defines minimum system performance requirements that must be met for different system conditions. They define different types of system events (or situations in which a transmission system facility is inadvertently taken out of service) into four different categories:

- Category A – All Facilities in Service (No Contingencies)
- Category B – Event resulting in loss of a single element
- Category C – Event(s) resulting in the loss of two or more (multiple) elements.
- Category D – Extreme event resulting in two or more (multiple) elements removed or Cascading out of service

For each of the different categories of contingencies, each reliability region is allowed to expand on the NERC requirements to make them more stringent. Minnesota and South Dakota are in the

Midwest Reliability Organization (MRO) reliability region, which is a new reliability region under development between the Mid-Continent Area Power Pool (MAPP), the Mid-America Interconnected Network (MAIN) and SaskPower. NERC Category C (contingency C5) includes the loss of "any two circuits of a multiple circuit towerline" with an exclusion for multiple circuit towers used over short distances in accordance with regional exemption criteria. Through the transition of MAPP into the MRO, the current MRO regional exemption is defined in the MAPP Reliability Handbook. In this region, if the transmission line is operated at a voltage of 100 kV or higher and the overall distance that the transmission line is double circuited is greater than one mile, then it meets the NERC Category C contingency definition.

NERC reliability standards require utilities to plan and be able to survive all Category C contingencies without system performance violations. In the case of generation outlet facilities near the Big Stone Plant, loss of a structure with two of the generation outlet transmission lines would require reduced generation levels from BSP II in order to avoid system performance violations.

Therefore, separate transmission circuits are needed in order to get the maximum amount of generation out of BSP II in the event that an adjacent transmission circuit is out of service. To achieve the most benefit of adding new transmission circuits out of the Big Stone Plant for BSP II, new transmission circuits cannot be constructed as double circuit lines. Without the generation available from BSP II, the Applicants might be forced to rely on higher cost generation resources.

Double circuit construction has been found acceptable if the power system can reliably withstand simultaneous failure of both circuits on a common structure. Double circuit construction could be appropriate in situations where the two circuits serve different functions, connect different substations, split away and proceed in different directions, or where high capacity (but not redundancy) is required. Since the transmission circuits leaving the Big Stone Plant are for generation outlet and being constructed to have high capacity with redundancy, it is not feasible to construct any of the new transmission circuits on common structures with any of the existing transmission circuits. This is based on analysis of single contingencies involving the loss of one transmission line and two transmission lines that may share common structures out of the Big Stone Plant. This analysis indicates that much higher generation levels at BSP II can be maintained if the transmission circuits leaving the Big Stone Plant use separate structures.

Building the new transmission circuits on separate structures is vital for providing back-up (redundant) transmission for outage of adjacent outlet circuits. Therefore, new transmission circuits out of the Big Stone Plant must be constructed so there is minimal chance for "common-mode" failures which would simultaneously take two circuits out of service.

Common tower outages for double circuit lines could be caused by:

- electrical failure of transmission line insulation due to lightning strike
- mechanical failure of one or more structures
- broken shield wire falling into power conductors
- wind-blown debris causing conductor-conductor short circuits
- insulator contamination due to road salt, soot or agricultural chemicals
- wind, sleet and ice conditions
- contact with aircraft or construction equipment (crane, dump truck)
- protective relaying malfunction ("sympathetic tripping" due to fault on adjacent circuit)

These common tower failure mechanisms have all been experienced on the transmission system within the northern MRO transmission system on double circuit lines.

NERC requirements for category D contingencies are a bit more relaxed than category C contingencies. Where category C contingencies require no system performance violations, category D contingencies are classified as "extreme" events that must be evaluated for risks and consequences. However, NERC allows detrimental system performance following category D contingencies in order to keep the transmission system from a complete failure (or "blackout"). The system response to category D contingencies could include losing a substantial amount of customer load and generation in a widespread area.

Category D contingency D7 refers to the loss of "all transmission lines on a common ROW". Since weather related incidents (i.e. tornadoes, ice storms, etc…) have the possibility of toppling transmission structures, physical separation of transmission circuits is important. Therefore, NERC classifies all circuits within a common ROW as a credible contingency. One structure could fall into another transmission circuit therefore taking both transmission circuits out of service. It is sometimes apparent that having two or more transmission circuits in the same right of way is unavoidable (i.e. highly populated areas, river crossings, etc…), but whenever possible, it is prudent to avoid creating situations that result in Category D events for transmission system additions.

Locating the new transmission lines proposed with the BSP II project within the same right of way as an existing transmission line is not desired in order to avoid the chance of a weather-related incident to cause both circuits in a common ROW to be out-of-service. Having two circuits out-of-service simultaneously will result in reduced generation levels from BSP II in order to avoid overloading adjacent outlet lines from the plant that remain in-service. In order to maximize the output from BSP II at all times, it is vital that new transmission circuits leaving the Big Stone site use separate right of ways.

The new Big Stone to Canby transmission line being constructed at 345 kV, but initially operated at 230 kV appears to be a candidate for double circuiting with the existing Big Stone to Marietta 115 kV transmission line. Analysis has been completed to identify the impact of double-circuiting the proposed Big Stone to Canby line with the existing Big Stone to Marietta 115 kV transmission line. By doubling-circuiting these lines, NERC considers loss of both circuits as a single contingency since a single structure failure would cause both circuits to be de-energized. By taking both of these circuits out-of-service simultaneously, it has been shown that there would not be a generator reduction required for BSP II. However, having the proposed Big Stone to Canby transmission line doubled-circuited with the existing Big Stone to Marietta 115 kV transmission line will result in lower voltages on the 115 kV transmission line system between Big Stone and Canby if both circuits are out of service simultaneously as compared to having each transmission line out separately. There is an advantage to transmission system voltages if the proposed Big Stone to Canby transmission line is separated from the existing Big Stone to Marietta 115 kV transmission line.

Analysis has been completed to identify the impact of double-circuiting the proposed Big Stone to Canby transmission line with the existing Big Stone to Blair 230 kV transmission line. By double-circuiting these lines, NERC considers loss of both circuits a single contingency since a single structure failure would cause both circuits to be de-energized. If both of these lines are out-of-service, the BSP II generation level would need to be reduced from 600 MWs to 420 MWs in order to avoid overloads on other adjacent transmission lines out of the Big Stone substation. If these two transmission circuits were separated and independently considered single contingencies there would not be a generator reduction required for BSP II. Keeping the new Big Stone to Canby transmission line separate from the existing Big Stone to Blair 230 kV transmission line allows for higher generation outlet levels from BSP II in the event of having only one of these circuits out of service versus both at the same time.

Likewise, analysis has been completed to determine if there is any impact on the BSP II generation level with the proposed Big Stone to Canby transmission line double-circuited with the existing Big Stone to Marietta 115 kV transmission line. By taking both of these circuits out-of-service simultaneously, it has been shown that there would not be a generator reduction required for BSP II. However, having the proposed Big Stone to Canby transmission line double-circuited with the existing Big Stone to Marietta 115 kV transmission line will result in lower voltages on the 115 kV system between Big Stone and Canby if both circuits are out of service simultaneously. Compared to having each transmission line out separately, losing both circuits at the same time will result in lower voltages on the transmission system. There is an advantage to transmission system voltages if the proposed Big Stone to Canby 230 kV transmission line is separated from the existing Big Stone to Marietta 115 kV transmission line.

The proposed Big Stone to Johnson 230 kV transmission line associated with transmission alternative 1 also appears to have a common "west – east" corridor with the existing 115 kV transmission line from Big Stone to the U.S. Highway 12 substation. According to single contingency analysis performed as part of the BSP II project, there does not appear to be an impact on BSP II generation if the proposed Big Stone to Johnson 230 kV transmission line is on double-circuit structures with the existing Big Stone to U.S. Highway 12 115 kV transmission line. Through this analysis however, it has been determined that there is the possibility for voltage concerns on the 115 kV system from the U.S. Highway 12 Substation to Appleton if the Big Stone to Johnson 230 kV transmission line is out of service at the same time that the Big Stone to U.S. Highway 12 115 kV transmission line is out of service. Having the Big Stone to Johnson 230 kV transmission line out of service independent from the Big Stone to U.S. Highway 12 115 kV transmission line allows for adequate 115 kV voltages from the U.S. Highway 12 Substation to Appleton in contrast to both circuits being out-of-service simultaneously. Based on the results of this analysis, it is apparent that separating the Big Stone to Johnson 230 kV transmission line from the existing Big Stone to U.S. Highway 12 115 kV transmission line is crucial for maintaining acceptable voltage levels on the 115 kV transmission system between the U.S. Highway 12 Substation and Appleton.

The Minnesota River is just west of the town of Ortonville. There is an existing 115 kV transmission line connecting the Big Stone 230 kV Substation and the U.S. Highway 12 Substation. From the U.S. Highway 12 substation, this 115 kV transmission line continues across the river to the Ortonville substation. The proposed Big Stone to Johnson 230 kV transmission line will need to cross this river in order to get to the final termination at Morris. In order to minimize environmental impacts, analysis has been completed to determine if there would be any impacts to BSP II if a portion of the Big Stone to Johnson 230 kV transmission line (approximately 2.2 miles) would double-circuit this existing 115 kV transmission line from U.S. Highway 12 to Ortonville. Through the analysis that was completed, it was shown that there is not a negative impact to the generation level of BSP II if the U.S. Highway 12 to Ortonville 115 kV transmission line is double-circuited with the proposed Big Stone to Johnson 230 kV transmission line. Having both the Big Stone to Johnson 230 kV transmission line and the U.S. Highway 12 to Ortonville 115 kV transmission line out-of-service at the same time will not cause any overloads on the adjacent transmission lines out of the Big Stone substation and therefore will not require BSP II to reduce its power output. Therefore, a portion of the Big Stone to Johnson 230 kV transmission line will be double-circuited with the U.S. Highway 12 to Ortonville 115 kV transmission line in order to minimize environmental impacts without negatively impacting BSP II generation.

5.0 CORRIDOR AND ROUTE SELECTION RATIONALE

5.1 CORRIDOR SELECTION PROCESS

The sections below describe the Applicants' and Western's corridor selection process.

5.1.1 UTILITY CORRIDORS

The Applicants evaluated several transmission system alternatives before deciding on the preferred Morris and Granite Falls corridors (Appendix B.3). The preferred corridors were selected for the Project based on the following screening criteria:

1. Establish endpoints based on MISO interconnection studies and load growth

   The Applicants considered a number of alternatives to provide an outlet for the power from BSP II and to increase the capacity and to improve reliability throughout the region. In early 2004, the Applicants completed an initial screening study in which they considered 11 different transmission alternatives. The alternatives were narrowed down to two broad system alternatives as discussed in Section 3.3. MISO's Interconnection Study analyzed these two alternatives in detail to determine how each one impacted the existing transmission system with the addition of BSP II.

   MISO completed the draft Interconnection Study in November 2004, concluding that "either alternative used to connect this generator to the system will work from steady state contingency analysis standpoint given that the proper system enhancements are made within the direct area of interconnection." (MISO Interconnection Study, November 2004, p. 75).

2. Accommodate regional planning

   The State of Minnesota has instituted long-range studies to increase transmission capacity and improve reliability of the electric transmission system in western/southwestern Minnesota and to transport generation resources from the Buffalo Ridge area in southwestern Minnesota and South Dakota to the Twin Cities and other markets when such power becomes available. In support of the regional planning studies, the Granite Falls transmission line is proposed to be constructed at 345 kV, to provide this additional transmission capacity, but this transmission line will be operated at 230 kV service until additional projects are developed in support of regional plans.

3. Improve rather than hinder system reliability

   Section 4.5 discusses system reliability in more detail related to the route selection.

4. Corridors will have more than one viable route

   Transmission system alternatives identified and examined in the CON application include the Morris Corridor, the Willmar Corridor and the Granite Falls Corridor. These corridors are approximately three miles wide, providing opportunities for more than one viable route (Minn. Stat. 116C.57). A route cannot be wider than one mile-and-a-quarter, according to Minn. Stat. 116C.52 subd. 8. The Applicants are proposing a route typically 2,000 feet wide.

5. Minimize length

   The length of the corridors was minimized, typically due to greater environmental impacts and costs.

6. Avoid populated areas, public infrastructure and large agricultural facilities, when feasible

   Heavily populated areas are scattered throughout the corridors with concentrations along the major highways (75, 12, 23, and 212), railroad alignments and along the Minnesota River. Comments received at the pre-application public meetings held in August 2005, indicated that the Project should avoid populated areas as much as possible.

   Public infrastructure and areas of concentrated irrigation were also avoided when feasible. Airport approach restrictions were considered while laying out the corridors.

7. Avoid major environmental (natural and socioeconomic) features, where feasible

   Environmentally sensitive areas include known concentrations of Federal and State-listed threatened and endangered species, areas of historical importance and visually-sensitive areas. Areas considered to be environmentally sensitive were identified from a number of data sources provided by the U.S. Fish and Wildlife Service (FWS), Minnesota Department of Natural Resources (DNR), Minnesota Department of Transportation (Mn/DOT), and Minnesota State Historic Preservation Office (SHPO). These areas were mapped using Geographic Information Systems (GIS).

8. Preferred corridors will follow existing ROW, when feasible

   During the initial corridor development process, identifying existing transmission lines that could be rebuilt, or paralleling linear features, such as roads, highways, section lines, transmission lines, railroads and pipelines, was considered. GIS mapping was used to identify the linear features discussed above.

5.1.2 WESTERN CORRIDORS

Alternative corridors were developed by Western as part of the Federal EIS alternatives development process. Western used two layers of screening to identify potential corridors. The first screening identified the physical constraints within the Project area, then used siting opportunities to identify potential corridors. The final screening criteria centered on identifying corridors that would maximize the opportunity to route transmission lines within each corridor. The scoping process took into account comments received during the Federal EIS scoping process. Scoping comments expressed concern about environmentally-sensitive resources along the Morris Corridor north of Ortonville and about routing transmission lines along U.S. Highway 12 in the Willmar Corridor in the vicinity of Danvers. With the range of comments received, and screening criteria, Western identified additional corridors suitable for transmission line routing along the Willmar and Granite Falls corridors. Appendix B.3 depicts the Applicants' corridors and the additional Western corridors.

Corridor constraints: Initial corridor screening criteria were developed to evaluate constraints within the project area that encompasses the Big Stone substation to the three interconnection locations. Constraints criteria included the presence of:

- Population centers: schools, daycare centers, hospitals
- Incompatible land uses: airspace, irrigation, wooded areas
- Environmentally-sensitive areas: wetlands, waterbodies, game production areas, waterfowl production areas (WPAs), wildlife management areas (WMAs), wildlife refuges, threatened and endangered species, visual (scenic byway), historical
- Electrical endpoints

Corridor siting opportunities: Corridor siting opportunities were used to identify the location of potential corridors. Opportunities include paralleling linear features, such as roads, highways, section lines, half-section lines, transmission lines, railroads and pipelines. The objective of defining usable three-mile-wide transmission line corridors is to consider the availability of transmission line routing opportunities using existing ROWs within each corridor

Inclusion of existing transmission lines within identified corridors also provides opportunities for transmission line rebuilding, double-circuiting and parallel ROWs unless those opportunities are restricted by system reliability or engineering criteria. Therefore, routing opportunities included consideration of existing transmission lines as part of corridor routing criteria.

Final Screening of Alternatives: Western developed final screening criteria to evaluate alternatives that would be carried forward for further consideration. All alternatives that were carried forward in the analysis were considered to meet the Project purpose and need, avoid irrigated croplands and other incompatible land uses. Final criteria used in the analysis were:

- Avoidance of areas of environmental sensitivity
- Avoidance of population centers
- Consideration of regional transmission planning objectives
- Maximizing routing opportunities
- Maximizing opportunities to upgrade existing transmission lines
- Ensuring reliability – corridor width, opportunity for transmission line separation

5.2 DISCUSSION OF CORRIDORS REJECTED

Several other corridors were considered by the Applicants in preparation of the CON. Through Western's screening process, other possible corridors were developed as part of the Federal EIS. However, the other corridors considered by the Applicants were found to be less satisfactory than the preferred corridors due to the selection process. Western, as part of their project alternatives screening process (outlined in Section 5.1.2), also considered but eliminated additional corridors (Appendix B.3). With these factors in mind, the Applicants considered, but rejected from further consideration, the following corridors during the CON development.

Big Stone to Canby – Minnesota Corridor

One corridor the Applicants considered was a corridor on the Minnesota side of the border from the Big Stone Plant to Canby. There is already a 115 kV transmission line within this corridor so the potential for utilizing an existing ROW exists. However, initial evaluation indicates that the 115 kV transmission system between Big Stone and Canby would be subjected to lower voltages if the proposed transmission line to Canby is double-circuited with the existing 115 kV transmission line. Furthermore, converting the existing 115 kV transmission line to 230 kV will essentially replace an outlet transmission line instead of introduce a new outlet transmission line for BSP II and therefore would subject the BSP II generator to possible operating restrictions in order to maintain acceptable system performance once the proposed unit is on-line. The existing Big Stone – Canby 115 kV transmission line will remain. Also, there are three substations along the Minnesota side that would have to be accommodated, whereas the South Dakota side has only one. Importantly, the Minnesota side presents a number of issues that are avoided by constructing the transmission line on the South Dakota side. A major concern is the Big Stone National Wildlife Refuge, which would have to be crossed by the transmission line. The transmission line would also cross the Minnesota River. The South Dakota transmission line avoids these natural features. The Applicants believe there is no advantage, environmental or economic, to consider the Minnesota corridor for this portion of the transmission line; the Applicants dropped this corridor from further review. Through their screening process described in Section 5.1.2, Western added a corridor centered on the Big Stone to Canby 115 kV transmission line for consideration in the Federal EIS process.

Big Stone to Granite Falls – Minnesota River Corridor

The shortest distance between two points is a straight line; unfortunately, however, the Minnesota River runs essentially along the transmission line between the Big Stone Plant and Granite Falls. There is no existing ROW of any kind along this corridor to suggest a possible route for a 345 kV transmission line. In addition to the environmental concerns that such a corridor raises, there are many cities and homes along the river that would have to be taken into account. Any cost savings anticipated from the shorter distance would likely be eroded by the additional geographic and hydrologic features present. Electrically, there appears to be no advantage to building the transmission line directly between Big Stone and Granite Falls, as opposed to running the transmission line to Canby and then to Granite Falls. A transmission line along the river does not strengthen the system, provides no ready taps for additional lines and has not been considered in any of the regional transmission planning studies. For all these reasons, the Applicants determined that it was not productive to evaluate a potential route along the Minnesota River.

U.S. Highway 75 Corridor to Canby

A route following U.S. Highway 75 would be similar to the other corridors between Big Stone and Canby, about six or seven miles to the east. U.S. Highway 75 is an existing ROW, so that would be a positive feature, although additional ROW would be required for the transmission line. However, U.S. Highway 75 runs through Bellingham, Minnesota and Madison, Minnesota and the transmission line would have to be routed through the cities. The other transmission line would be slightly longer along the highway than directly south from the Big Stone Plant because the highway connects the cities. Such a corridor has not been considered in other regional planning studies, nor would it offer any electrical or environmental advantages over the other corridors.

Big Stone to Morris – Direct Transmission Line Corridor

Certainly other corridors between the Big Stone Plant and Morris could be identified, including a diagonal from one point to the other. Such a corridor would entail entirely new ROW, in contravention of the State's non-proliferation policy. A 230 kV transmission line along this corridor also means that additional planning studies would be required to determine how the new transmission line would affect the existing 115 kV transmission line and the system. As with other rejected corridors, there seems to be no good reason to think that this corridor has any benefits over the preferred corridor. Additionally, the Applicants are constrained by Big Stone Lake to the west and several small lakes, wetlands and natural resources to the east of the existing 115 kV transmission line.

Spicer Corridor

The Spicer Corridor was discussed in the CON; however, after further environmental analysis and pre-route application public meetings, this corridor option was discarded by both the Applicants and Western.

5.3 ROUTE SELECTION PROCESS

Planning environmental, engineering and design utility entities determined the criteria used to route the transmission lines. They considered State requirements as well as input received at pre-filing meetings. Additionally, since there is a Federal EIS required for this Project, the comments received during the Federal EIS scoping meetings were also considered in routing the transmission line. Since there are several permitting constraints (State and Federal) associated with this Project, it was necessary to consider routes only within the corridors proposed in the CON and Federal EIS processes for the purposes of this Application. These corridors are identified in Appendix B.3. Preliminary routes within the corridors as defined in Section 5.3 were developed by considering the following:

1. <u>Minimize impacts to reliability, develop redundancy</u>
   Routing transmission lines in close proximity to existing lines or double circuiting was considered. However, in some cases, reliability and safety concerns were raised and separation of lines and circuits were preferred. Routing options were excluded from further consideration if taking the transmission line out of service during construction, double circuiting or running parallel to the existing transmission line would hinder system reliability or violate NERC regulations. Also see Section 5.1.1 (3) for reliability discussion.
2. <u>Follow existing ROWs, survey lines, natural division lines and agricultural field boundaries, when feasible</u>
   The Applicants used GIS mapping and then field verified existing ROWs, roads, railroads, transmission lines, and field lines. A primary factor considered in identifying routes is a policy in the State of Minnesota to avoid creating new ROWs if existing ROW can be used. This is called the nonproliferation policy, adopted by the Minnesota Supreme Court in the case *People for Environmental Enlightenment and Responsibility, Inc. (PEER) v. Minnesota Environmental Quality Council,* 266 N.W.2d 858, 868 (Minn.1978). In that case, the Supreme Court held that "as a matter of law, choose a pre-existing route unless there are extremely strong reasons not to do so."

The Commission's rules also recognize that nonproliferation is an important consideration in selecting final routes for new transmission. Minnesota Rules part 4400.3150, items H and J. The Applicants recognized that selecting a route that would result in completely new ROWs would run counter to the nonproliferation policy and be discouraged.

3. Minimize length
   In most cases, minimizing length of the route decreases impacts. However, in some situations, a longer route is chosen to avoid impacts to homes and natural resources. Also refer to Section 5.1.1 (5).
4. Avoid populated areas, when feasible
   One of the most common comments received at the pre-application public meetings, was to avoid residences (Appendix O.1). Also refer to Section 5.1.1 (6) for additional discussion on populated areas.
5. Avoid large agricultural facilities
   Routing consideration was taken to avoid center pivots, dairy farms and poultry farms when feasible.
6. Avoid airports and other land use conflicts
   Airports were identified on aerial maps, U.S. Geological Survey (USGS) maps and verified during field work. The Applicants also received comments during public meetings regarding planned airport or air strip expansions.

   The Applicants worked with local governments obtaining zoning and land use maps to avoid conflicts. WMA's, WPA's and National Wildlife Refuges were identified and mapped. These land uses were avoided whenever possible. See Section 5.1.1 (6) for additional discussion on land use criteria.
7. Avoid major environmental features where feasible
   Major environmental features such as prairie and rock outcroppings, threatened and endangered species, water and wetlands, biodiversity areas identified by the MCBS, WMA's, WPA's, SNA's, and National Wildlife Refuges were identified, mapped and avoided whenever possible. See Section 5.1.1 (7).

The routes were refined to avoid more specific items identified by the public at the pre-filing public meetings. See Appendix P.1 for a summary of public comments. These items include:

- Utilize existing ROW where feasible.
- Avoid and minimize impacts to individual landowners and population concentrations.
- Avoid and minimize impacts to water resources and wildlife.
- Avoid and minimize conflicts with adjacent land uses such as agriculture and recreational areas.
- Avoid and minimize impacts to cultural resources.
- Avoid and minimize impacts to businesses.

The routes are then submitted to regulatory agencies for comment on the preliminary route options. The routes are reevaluated to consider the information gained from agencies and utilities. The Applicants followed up on major concerns that arose and reviewed the impacts associated with the routes and compared costs. The proposed and preferred routes for each of the corridors presented in the application are based on the best combination of the following, considering input gained on the route options:

- Minimizing environmental impacts to agriculture, residents and natural resources
- Minimizing costs
- Minimizing impacts to reliability

Appendix D is a summary of the impacts evaluated above for each route under consideration. The segments considered during the route selection process and the applicable environmental information are included in Appendix D.

6.0 MORRIS CORRIDOR: ENVIRONMENTAL INFORMATION

6.1 MORRIS ROUTE 1

6.1.1 DESCRIPTION OF ENVIRONMENTAL SETTING

Morris Route 1 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 (ECS). 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 Morris Route 1 range from approximately 950 to 1,200 feet above mean sea level (amsl).

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 most of the smaller watercourses have been channelized to increase the acreage of land available for agricultural production.

The majority of Morris Route 1 crosses cropland used to grow corn and soybeans. Communities near the route are primarily small farm-based towns. The exception to this is Morris, a level 4 regional trade center at the northeastern end of the route. A level 4 regional trade center is a partial shopping center, according to the 1999 Regional Trade Center of the Upper Midwest. A few WMAs are present near the route, along with several wetlands. Relatively few forested areas are present; most wooded areas are adjacent to farmsteads.

6.1.2 HUMAN SETTLEMENT

6.1.2.1 Public Health and Safety

Proper safeguards will be implemented for construction and operation of the facility. The Project will be designed with local, State, RUS and NESC standards regarding clearance to ground, clearance to crossing utilities, clearance to buildings, strength of materials and ROW widths. Construction crews and/or contract crews will comply with local, State, RUS and NESC standards regarding installation of facilities and standard construction practices. Established Applicants' and industry safety procedures will be followed during and after installation of the transmission line. This will include clear signage during all construction activities.

The proposed transmission line will be equipped with protective devices to safeguard the public if an accident occurs and a structure or conductor falls to the ground. The protective devices are breakers and relays located where the transmission line connects to the substation. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation facilities will be fenced and access limited to authorized personnel.

For a discussion of potential airport conflicts see Section 6.1.2.2.

6.1.2.2 Commercial, Industrial and Residential Land Use

Zoning information was obtained for the counties and cities along Morris Route 1 which includes Stevens and Big Stone counties. There are four communities within one mile of Morris Route 1: Alberta, Chokio, Johnson and Ortonville. Morris is greater than three miles from the eastern end of Morris Route 1.

As Table 7 shows, nearly 95 percent of the land in Morris Route 1 is agricultural. Segments M-7 and M-17 encompass the largest portion of agricultural land due to their location and length. Segments M-2, M-3, and M-5 cover the majority of the wetland/riparian/open water areas along the route. Appendix I.1 defines the land use types identified in Table 7. Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 7
GAP LAND USE DATA FOR MORRIS ROUTE 1

Land Use Type	TOTAL	
	Area (acres)	Percent of Route
Agriculture	8339.32	94.81
Wetland/Riparian/Open Water	392.85	4.47
Forest	48.20	0.55
Shrubland	0.09	<0.01
Prairie	15.12	0.17
Developed	0.08	<0.01
Total	8795.66	100

Stevens County

The majority of the land crossed by the Morris Route 1 alignment is zoned agricultural (A-1). Public utilities are a conditional use in this zoning district (Appendix I.2)

The Chokio-Alberta Elementary School is located on 311 First Street in Chokio, and is several hundred feet from the route alignment. The Chokio-Alberta Secondary School is located on Main Street in Alberta, and is also several hundred feet from the route alignment. No registered child care providers were identified within the route alignment. There is one church and two cemeteries in Chokio; none of these are located along the alignment.

The Morris Municipal Airport is located approximately 1.5 miles east of the eastern terminus of Morris Route 1. No impacts are anticipated, since the route is outside the airports' safety zones.

Big Stone

The majority of land crossed by the route alignment in Big Stone County is zoned agricultural (A-1 and A-2). Transmission lines are a permitted use within existing ROWs and are a conditional use outside of ROWs (Appendix I.3)

There are no public schools within the alignment, though Knoll Elementary and Ortonville Secondary are located within Ortonville. No registered child care providers were identified within the route, though one exists at the Knoll Elementary School. There are no churches or cemeteries along the alignment; several churches are within Ortonville.

The route alignment crosses two runway approach areas of the Ortonville Airport. At present, Ortonville Airport has one paved runway (16-34) and one grass runway (4-22). Both have a 20:1 approach slope. Segment M-1 runs east-west along the south side of the airport; Segment M-2 runs north-south along the east side of the airport. Segment M-1 passes within the horizontal zone on the south side. The horizontal zone limits the height of structures to 1,252 feel MSL, approximately 150 feet above the ground surface. Segment M-1 also passes through the south approach zone of the 16-34 runway. At the point that is crosses, structures are limited to approximately 1,270 feet MSL, which is approximately 170 feet above the ground surface.

The Ortonville Airport has plans to extend the 16-34 runway to the north by 583 feet. The south end will not change. The approach slope will change from 20:1 to 40:1. Under this airport improvement scenario, Segment M-1 would cross the south approach zone of 16-34 at a point where structures are limited to approximately 1,180 feet (80 feet above ground surface). The north approach zone would limit the height of some structures along U.S. Highway 75 to approximately 1,170 (70 feet above ground surface).

6.1.2.3 Displacement

There is one home in Morris Route 1 that is located within 100 feet of the route alignment. There are eight homes that are within 300 feet, but greater than 100 feet, from the route alignment. See Appendix O for a breakdown of the number of homes along the route alignment.

6.1.2.4 Noise

Noise is defined as unwanted sound. It may be comprised of a variety of sounds of different intensities across the entire frequency spectrum.

Noise is measured in units of decibels (dB) on a logarithmic scale. Because human hearing is not equally sensitive to all frequencies of sound, certain frequencies are given more "weight." The A-weighted decibel (dBA) scale corresponds to the sensitivity range for human hearing. Noise levels capable of being heard by humans are measured in dBA. A noise level change of 3 dBA is barely perceptible to average human hearing. A 5 dBA change in noise level, however, is clearly noticeable. A 10 dBA change in noise levels is perceived as a doubling or halving of noise loudness, while a 20 dBA change is considered a dramatic change in loudness. Table 8 shows noise levels associated with common, everyday sources and places the magnitude of noise levels discussed here in context.

TABLE 8
COMMON NOISE SOURCES AND LEVELS

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

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

The Minnesota Pollution Control Agency (MPCA) has established standards for the regulation of noise levels. The land use activities associated with residential, commercial and industrial land have been grouped together into Noise Area Classifications (NAC)(Minn. Rules 7030.0050). Each NAC is then 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 7030.0040). Table 9 shows the MPCA daytime and nighttime limits in dBA for each NAC. The limits are expressed as a range of permissible dBA within a one hour period; L_{50} is the dBA that may be exceeded 50 percent of the time within an hour, while L_{10} is the dBA that may be exceeded 10 percent of the time within an hour. Residences, which are typically considered sensitive to noise, are classified as NAC 1.

TABLE 9
MPCA NOISE LIMITS BY NOISE AREA CLASSIFICATION (DBA)

Noise Area Classification	Daytime		Nighttime	
	L_{50}	L_{10}	L_{50}	L_{10}
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Noise concerns for this Project may be associated with both the construction and operation of the energy transmission system. Transmission conductors and transformers at substations produce audible noise under certain conditions. The level of noise, or its loudness, 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. In addition, very few people are out near the transmission line during rainstorms. For these reasons, audible noise is not noticeable during heavy rain. During light rain, dense fog, snow and other times when there is moisture in the air, the proposed transmission lines will produce audible noise higher than rural background levels but similar to household background levels. During dry weather, audible noise from transmission lines is an imperceptible, sporadic crackling sound.

The primary land use along Morris Route 1 is rural agricultural land. Typical noise sensitive receptors along the route will include residences, churches, schools and parks where either sleep or outdoor activities occur. 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.

6.1.2.5 Aesthetics

In general, aesthetic impacts are dependent on the response of the viewer. Viewer response is based on the sensitivity and exposure of the viewer to a particular viewshed. Sensitivity relates to the magnitude of the viewer's concern for the viewshed, while exposure is a function of the type, distance, perspective and duration of the view. Sensitivity can be described in terms of "levels of sensitivity." Three levels of sensitivity can be used to identify potential impact areas:

- Low Visual Sensitivity – motorists viewing transmission lines from the perspective of the roads they traverse
- Moderate Visual Sensitivity – recreationalists, such as bird watchers, hikers, hunters and other individuals whose activity is specific to and who are sensitive to a finite geographic location, and who are sensitive to man-made structures and their impact on the natural environment
- High Visual Sensitivit – residential viewers who own property within 500 feet of the proposed route alignments and are concerned about the structures and how they impact the view of the natural environment

The preferred structures for the transmission line will be wood H-frames, which are shorter than single circuit, steel pole structures, but are wider and utilize two poles. The H-fram structures are between 70 and 100 feet in height and have a permanent impact of 1,000 square feet. The single pole structures are between 80 and 120 feet in height. The structures for the existing 115 kV transmission line are wood H-frames that vary between 50 and 80 feet high depending on the terrain and land elevation. Typically, these structures are 60 to 65 feet high. **Error! Reference source not found.** in Appendix J shows the configuration of a typical wood H-frame structure.

Morris Route 1 follows existing highways, county/township roads and transmission line corridors. The majority of the surrounding land use is agricultural. **Error! Reference source not found.** in Appendix J also shows how a typical road ROW transmission line installation would appear. Morris Route 1 will have limited impact on the aesthetics in the corridor because the existing transmission line is being upgraded without the addition of a new transmission line to the viewshed. There are four communities within one mile of the route: Alberta, Chokio, Johnson and Ortonville. Morris is more than three miles from the eastern end of Morris Route 1; therefore it will be difficult to view the transmission line from Morris. The degree to which the structures are visible from Alberta, Chokio and Johnson will vary depending on the proximity of the transmission line to each town, as well as elevation. The proposed transmission line, much like the existing transmission line, will not be visible from downtown Ortonville. However, residents on the southern and eastern outskirts of Ortonville will likely be able to see the transmission line.

A part of the route parallels Trunk Highway 7 and crosses U.S. Highway 75. The Big Stone National Wildlife Refuge is within one mile of Morris Route 1 and two WMAs (Otrey and Prairie) are located within 1,000 feet of the proposed route alignment. These areas would be considered moderate to high visual sensitivity resources. **Error! Reference source not found.** in Appendix J shows Morris Routes 1 and 2 adjacent to the Big Stone National Wildlife Refuge (routes 1 and 2 follow a common alignment near the wildlife refuge).

Homes within 500 feet of the route alignment would be the most likely to have their viewshed affected by the construction of a transmission line, and are therefore considered potentially high visual sensitivity resources. Review of field data and aerial photography indicates that 16 homes are located within 500 feet of the Morris Route 1 alignment.

6.1.2.6 Socioeconomic

Morris Route 1 is located in Stevens and Big Stone counties. Table 10 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Population and economic data is analyzed at the block group level, the most detailed level for which economic data is available. Due to the rural nature along the route, the block groups are larger than the actual area encompassed by Morris Route 1. As can be seen in Table 10, Morris Route 1 does not contain populations of disproportionately high minority populations or low-income populations.

TABLE 10
MORRIS ROUTE 1 POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Total Minority Population	Minority Population Percentage	Per Capita Income	Percent of Population Below Poverty Level
Minnesota	4,919,749	521,494	10.6	$23,198	7.9
Stevens County	3,767	426	11.3	$17,569	15.4
Block Group 3, Census Tract 9801	639	22	3.4	$18,097	9.3
Block Group 4, Census Tract 9801	761	3	0.4	$16,545	11.0
Big Stone County	2,407	101	4.2	$15,708	10.7
Block Group 1, Census Tract 9501	515	11	2.1	$13,186	8.6
Block Group 3, Census Tract 9501	546	3	0.5	$15,399	11.4

Table 11 identifies the top three leading industries in each county along Morris Route 1 (MNPRO 2005).

TABLE 11
LEADING COUNTY INDUSTRIES

Geographic Area	Industry	Percent of Workforce
Stevens County	Educational, health and social services	32.9
	Agriculture, forestry, fishing and hunting and mining	11.0
	Retail trade	10.6
Big Stone County	Educational, health and social services	27.1
	Agriculture, forestry, fishing and hunting and mining	13.4
	Retail trade	9.6

6.1.2.7 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 Morris Route 1 (Ortonville, Johnson, Chokio and Alberta) appear to have cultural values steeped in rural agriculture and light industry. Ortonville has been a regional commercial and light industrial hub since the 1880s, and all of the communities noted above have been agricultural and transportation centers since the later half of the 19th century. Railroads traverse the area east to west and whistle stops, such as Johnson and Chokio, were important places to gather agricultural goods and transport them to markets. Important crops along the route include wheat, corn, soybeans and alfalfa, while hogs and dairy and beef cattle have a notable presence as well. The residents along Morris Routes 1 and 2 likely value the rural economy and the opportunity it brings to the region.

Public lands along Morris Route 1 offer residents and visitors opportunities for recreational activities that include hunting, fishing, boating, and snowmobiling. Resorts, parks and campgrounds on area lakes, in particular Big Stone Lake, encourage a growing tourism industry that focuses on the experience of the natural environment. Other opportunities are offered by the headwaters of the Minnesota River (the southern outlet of Big Stone Lake) the Big Stone National Wildlife Refuge.

The communities along Morris Route 1 also value their heritage and pioneer roots as settlers of the rivers, lakes and prairies of the vicinity. It appears that community and county historical societies have recently embraced heritage tourism as an industry. Historic railroad corridors, highways such as the King of Trails (U.S. Highway. 75), and NRHP-recognized structures, districts, and museums provide excellent opportunities for recreation related to interests in heritage.

6.1.2.8 Recreation

There are a variety of outdoor recreational opportunities along Morris Route 1, including snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting and nature observation. Appendix K.3 shows the locations of WMAs within the vicinity of the routes. The detailed route maps in Appendix F identify the WMAs in more detail. The Big Stone National Wildlife Refuge is within one mile of Morris Route 1. There are two WMAs (Otrey and Prairie) located along the route. Within one mile of the route alignment, there are five additional WMAs, including Reisdorph, Victory, Thomson, Malta and Brouillet. There are also four FWS WPAs (Prairie, Redhead Marsh, Schultz and Twin Lakes), located along the route. Within one mile of the route alignment, there are six additional WPAs, including Tangen, Jorgenson, Larson Slough, Thomson, Dismal Swamp and Jacobson. The proposed route alignment crosses one snowmobile trail in Segment M-1 east of Ortonville. The Minnesota River Valley Birding Trail crosses through Morris Route 1 on U.S. Highway 10 (Segment M-5 alignment). The trail is a project of Audubon, Minnesota and connects the best birding sites within the Minnesota River Valley, providing opportunities for birdwatching and enjoying wildlife (Audubon Minnesota 2005). Morris Route 1 also crosses U.S. Highway 75.

6.1.2.9 Public Services

Morris Route 1 includes Stevens and Big Stone counties and four communities within one mile of the proposed route alignment: Alberta, Chokio, Johnson and Ortonville. This is a rural area, and Ortonville is the primary community 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. For a discussion of potential airport conflicts see Section 6.1.2.2.

6.1.2.10 Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during the construction and operation of the facility. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the pole locations), impacts will be minimal and no mitigation is anticipated.

Coordination with local government representatives would likely be necessary to address any conflicts between the route and the proposed new runway approach safety zones for the Ortonville airport.

Displacement

The Applicants will work with landowners to make route alignment adjustments to avoid displacement. No displacement is anticipated.

Noise

The proposed transmission line was modeled using the Bonneville Power Administration CFI8X model to evaluate audible noise from HVTLs. Where possible, the model was executed as a worst-case scenario benchmark to ensure that noise was not under-predicted. This involved adjusting the orientation of phase angles. The single circuit Morris 230 kV transmission line was modeled on both H-frame tangent and davit arm tangent structures. The analysis relied on the assumptions presented in Table 12.

TABLE 12
ASSUMED PARAMETERS FOR 230 KV SINGLE CIRCUIT STRUCTURES

Parameter	230 kV H-Frame	230 kV Davit Arm
Conductor Diameter (inches)	1.345	1.345
Phase Angle Orientation (degrees)	240, 120, 0	240, 120, 0
Line Current (A)	1,300	1,300
Line to Neutral Voltage (kV)	132.79	132.79
Conductor Horizontal Locations (feet, relative to center)	-20, 0, 20	-19, 14, -14
Conductor Vertical Locations (feet, relative to ground)	42	52, 62, 72

The predicted audible noise from the transmission lines is presented in Table 13. No exceedences of the MPCA daytime and nighttime limits are predicted at the nearest sensitive receptors for the Morris 230 kV transmission line.

TABLE 13
PREDICTED AUDIBLE NOISE FROM MORRIS 230 KV TRANSMISSION LINES (DBA)

Conductor Size	Distance from center of transmission line corridor (feet)								
	-300	-200	-100	-50	0	50	100	200	300
H-Frame, 230 kV transmission line with 954 ACSS	34	36	39	43	44	43	39	36	34
Single Pole Davit Arm, 230 kV transmission line with 954 ACSS	33	35	38	41	41	40	37	35	33
H-Frame, 230 kV transmission line with 1272 ACSR	32	34	37	40	42	40	37	34	32
Single Pole Davit Arm, 230 kV transmission line with 1272 ACSR	31	33	36	38	39	38	35	32	30

To avoid minimize construction noise, the Applicants will fit internal combustion engines associated with construction activities with approved mufflers and spark arresters.

Aesthetics

Although the transmission line will be a contrast to surrounding land uses, the Applicants will work with landowners to identify concerns related to the transmission line 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.
- To the extent practicable, existing transmission lines will be reconductored and/or double-circuited.to the extent that such actions do not violate sound engineering principles or system reliability criteria.
- To the extent practicable, new transmission lines will parallel existing transmission lines and other ROWs to the extent that such actions do not violate sound engineering principles or system reliability criteria.
- Structures will be placed at the maximum feasible distance from highway and trail crossings within limits of structure design.

Socioeconomic

Short-term impacts to socioeconomic resources will be relatively minor. The construction, operation and maintenance of the transmission line will not affect socioeconomic resources along the route.

The relatively short-term nature of the Project construction and the relatively small number of workers who will be provided from outside of the Project area should result in short-term positive economic impacts in the form of increased spending on lodging, meals and other consumer goods and services. It is not anticipated that the Project will create new permanent jobs, but it will create temporary construction jobs that will provide a one-time influx of income to the area.

Construction activity would require approximately 40 full-time personnel. Of the 40 personnel, approximately 25 employees will be needed during transmission line construction and additional workers will be required for substation construction. Additionally, part-time personnel may also be needed during the construction of this Project.

It is anticipated that the majority of workers needed for this Project, other than earth movers, will be supplied from the Applicants' construction workforce for the Johnson Junction Substation. It is anticipated that Western will bid out the work for the Morris Substation. Lineman positions that cannot be filled by the Applicants will be contracted out. No permanent net change in workforce is projected.

If local contractors are used for portions of the construction, total wages and salaries paid to contractors and workers in surrounding counties will contribute to the total personal income of the region. Additional personal income will be generated for residents in the region and the State by circulation and recirculation of dollars paid out by the Applicants as business expenditures and State and local taxes.

Expenditures made for equipment, energy, fuel, operating supplies and other products and services benefit businesses in the counties where the Project is located. Indirect impacts may occur through the increased capability of the electric system to supply energy to commercial and industrial users, which will contribute to the economic growth of the region.

Agricultural land will be temporarily removed from production during transmission line construction. Permanent agricultural land conversion is associated with the transmission line structures and is estimated at approximately 7.0 acres for Morris Route 1. Landowner compensation will be established by individual easements. In general, agricultural areas surrounding transmission line structures will still be accessible to farming. Project construction will not cause additional impacts to leading industries within the area. Mitigation measures will include:

- The movement of crews and equipment will be limited to the ROW to the greatest extent possible, including access to routes. The contractor will limit movement on the ROW so as to minimize damage to grazing land, crops or property and will avoid marring the land. If, during construction, movement outside of the ROW is necessary, permission will be obtained and any crop damage will be paid to the landowner.
- When weather and ground conditions permit, all deep ruts that are hazardous to farming operations and to movement of equipment will be obliterated or compensation will be provided as an alternative if the landowner desires. Such ruts will be leveled, filled and graded or otherwise eliminated in an approved manner. In hay meadows, alfalfa fields, pastures and cultivated productive lands, ruts, scars and compacted soils will have the soil loosened and leveled by scarifying, harrowing, discing or other approved methods. Damage to ditches, tile drains, terraces, roads and other features of the land will be corrected. The

land and facilities will be restored as nearly as practicable to their original conditions.

- ROW easements will be purchased through negotiations with each landowner affected by the Project and payment will be made of full value for crop damages or other property damage during construction or maintenance as negotiated.
- Construction will be scheduled during periods when agricultural activities would be minimally affected or the landowner will be compensated accordingly.
- Fences, gates and similar improvements that are removed or damaged will be promptly repaired or replaced.

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

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

Cultural Values

The construction of the proposed transmission facilities will serve the region with a stable power supply for years to come. As the Western Minnesota region continues to grow and the diverse economic base continues to expand, the available power supplied by upgraded and additional facilities will probably 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.

Recreation

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants intend to and will work diligently to avoid any direct impacts to WMAs within the route. The Applicants will likewise attempt to avoid placing structures in Prairie, Schultz and Redhead Marsh WPAs; however, because the transmission line crosses through Twin Lakes WPA for a distance greater than 1,000 feet, it is likely that six structures will be placed within that resource. An easement will be required and the Applicants will work with the FWS on minimizing impacts in this area. The easement will be approximately 17.6 acres. Due to the proximity of the route to Schultz WPA, it is estimated that an easement of approximately 4.3 acres will be required. Because Morris Route 1 is a rebuild of an existing transmission line, the structures likely will be placed in an existing transmission corridor and structure for structure replacement will occur in sensitive areas where feasible. This approach will minimize impacts to previously-undisturbed habitat. However, since the transmission line will be taller, wider spans are possible and the number of structures along the route or in sensitive areas may be decreased overall. The Applicants will work with the FWS on minimizing impacts in this area.

The transmission line will likely be visible from the northern edge of the Big Stone National Wildlife Refuge, the WMAs and WPAs within one mile, the Minnesota River Valley Birding Trail and U.S. Highway 75, but will not be a new visual feature since Morris Route 1 is a rebuild of an existing line. The route will not interfere with the use of those recreational resources.

Public Services

No impact is expected to public services along Morris Route 1.

6.1.3 LAND-BASED ECONOMICS

6.1.3.1 Agriculture

Along Morris Route 1, approximately 95 percent of the land is used for agriculture (U.S. Geological Survey (USGS) 2004), and approximately 96 percent of the soils are listed by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) as prime farmland, prime when drained or farmland of statewide importance (NRCS 2005).

According to the 2002 Census of Agriculture, Big Stone County has had the average farm size increase 1 percent between 1997 and 2002. The number of full-time farms has decreased by two farms during that time period. Crop sales in 2002 for Big Stone County were $44,923,000 (78 percent of agricultural products sold) and livestock sales were $12,747,000 (22 percent). Crops in Big Stone County are primarily corn and soybeans (USDA 2002).

Stevens County has had the number of farms increase by 6 percent and the average farm size decrease by 6 percent between 1997 and 2002. The total land in farms in the county has decreased by approximately 1 percent. Crop sales in 2002 for Stevens County were $65,116,000 (54 percent of agricultural products sold) and livestock sales were $55,093,000 (46 percent). Crops in Stevens County are primarily corn and soybeans. Livestock is primarily hogs, cattle and poultry (USDA 2002).

There are no central-pivot irrigation systems in use along Morris Route 1.

6.1.3.2 Forestry

Morris Route 1 occurs in what was historically the Prairie Grassland region of Minnesota. The primary tree cover in the Project area is associated with waterways and homesteads. No economically important forest resources are within the Project area. Appendix I.1 lists specific categories for each general land cover type.

6.1.3.3 Tourism

Big Stone Lake offers fishing and other water-related outdoor activities. Big Stone National Wildlife Refuge includes opportunities for tourist activities, such as hiking trails, an auto tour route, snowshoeing, cross-country skiing, hunting, fishing, wildlife observation and educational opportunities (FWS 2004). Additionally, there are several large lakes in Big Stone County within one mile of Morris Route 1 that are used for fishing and recreational boating, where it would be possible for recreationalists to view the transmission line structures.

The Big Stone County Historical Museum in Ortonville displays local geology, archaeology and wildlife taxidermy. Paul Bunyan's 110-ton anchor, two log cabins and a historic Muskegon boat are on the grounds for viewing (Explore Minnesota 2004). The museum is not along the route alignment, although it is possible that the transmission line would be visible from the grounds.

The Minnesota River Valley Birding Trail crosses through Morris Route 1 on U.S. Highway 10. U.S. Highway 75 runs through Ortonville and crosses Morris Route 1. These resources are discussed in more detail in Section 6.1.2.8.

6.1.3.4 Mining

Morris Route 1 lies in glacial moraine deposits consisting primarily of clayey, silty and sandy till with some gravel. Some glacial outwash (sand and gravel) deposits are interspersed within the till formations. The area topography is typical of a glacial moraine, exhibiting many small hills and depressions. The glacial deposits are fairly thick, ranging from 320 to 340 feet.

The bedrock geology consists of a thin covering of Cretaceous sediments overlying the Precambrian crystalline rock. A Precambrian bedrock high is present north of the route alignment in Stevens County and slopes steeply to the west in the vicinity of Johnson and Graceville, Minnesota.

Notable mining resources in the area include the quaternary sands and gravels present in glacial outwash deposits. An inactive gravel pit is located west of Morris Route 1 in Big Stone County (NE ¼ of Section 18 in Malta Township). The potential exists for developable Precambrian bedrock resources, such as quarry grade metamorphic stone, at the southern/western terminus of the route alignment where the Minnesota River has eroded into the overlying deposits.

6.1.3.5 Impacts and Mitigation: Land-Based Economies

Agriculture

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the route of the transmission line (Appendix L.2). The Applicants estimate permanent impacts to agricultural lands at approximately 7.0 acres for Morris Route 1. Approximately 96 percent of the permanent impacts to agricultural lands will occur on prime farmland soils or soils of statewide importance. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur.

The Applicants estimate that approximately 237 acres of agricultural land will be impacted temporarily by Morris Route 1 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 9.0 acres. Section 6.1.2 describes the land use impacts for the route in more detail.

No impacts to central pivot irrigation are expected along Morris Route 1. The Applicants will work with landowners to minimize impacts to farming operations along the route. By aligning the transmission line along section and field lines, impacts can be minimized. Landowners commented at the public meetings that they would prefer structures as close to the field lines and roadways as possible. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Forestry

No economically important forestry resources are located along the proposed route alignment. Construction staging areas will be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. Unless otherwise agreed upon by the landowner, all storage and construction buildings, including concrete footings and slabs, and all construction materials and debris will be removed from the site once construction is complete. The area will be regraded as required so that all surfaces drain naturally, blend with the natural terrain and are left in a condition that will facilitate natural revegetation, provide for proper drainage and prevent erosion.

Impacts along the route to shelterbelts are estimated at 6.9 acres. Clearing of the ROW in these areas will be limited to the amount necessary to permit the safe and reliable operation of the transmission line.

Clearing for access roads will be limited to only those trees necessary to permit the passage of equipment. Temporary access roads 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.

Tourism

No impacts to area tourism are anticipated from the presence of the transmission line and no mitigation is necessary.

Mining

Based on a review of existing information, Morris Route 1 would not impact active mining or quarrying operations. No mitigation is necessary.

6.1.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

6.1.4.1 Methodology

The following presents the results of archival review of previously-recorded archaeological and historic resources within Morris Route 1. General information on the research methodology applied to the archival review is briefly presented; this methodology also applies to discussions of other routes in the Application. The results include counts of known archaeological and historic resources and provide general information on those features identified during a Public Land Survey (PLS) map review. Detailed descriptions of these resources can be found in archaeological and historic resource overviews prepared by Palmer et al. (2005a, 2005b, 2005c).

The Applicants sponsored overviews of known archaeological and historic resources within the corridors (Palmer et al. 2005a, 2005b, 2005c). For this overview, information on known archaeological and historic resources in the corridors was gathered from the SHPO in St. Paul, Minnesota. PLS maps, showing natural, archaeological and historic conditions during the latter half of the 19th century, were reviewed as a world wide web-based resource from the Minnesota Land Management Information Center. Other archival and environmental resources were available at repositories in Minneapolis, Minnesota and on the world wide web.

The Applicants also sponsored a windshield survey of selected portions of the routes. During the survey, all townships were visited and selected buildings within the routes were photographed. Visited towns and cities in Minnesota included Alberta, Chokio, Danvers, DeGraff, Granite Falls, Hazel Run, Johnson, Murdock, Odessa, Ortonville, Saint Leo and Willmar.

The previously-identified archaeological and historic resources on file at the SHPO were digitized into a GIS. The resources were then projected to show spatial relationships between the archaeological and historic resources and the proposed routes. Two spatial parameters were used in this discussion: archaeological resources within 500 feet of the proposed routes and historic standing structures within one mile of the proposed routes.

6.1.4.2 Morris Route 1 Results

One previously-identified archaeological resource, an earthwork reported by Winchell (Site 21BS0008), is within 500 feet of Morris Route 1 and is listed in Appendix L.1.

In addition, 137 previously inventoried standing structures have been recorded within one mile of Morris Route 1 (Appendix L.2). Previously-identified standing structures include community and commercial buildings, residences, cabins, churches, farmsteads, bridges and a park. Construction dates of these inventoried structures generally range from the 1870s to the 1970s. Many of the structures are centered in cities or towns. Properties in Ortonville include the individually National Register of Historic Places (NRHP)-eligible Marsh County Bridge (BS-ORT-059) and the individually NRHP-listed Big Stone County Courthouse (BS-ORT-042), Columbian Hotel (BS-ORT-027) and Ortonville Free Library (BS-ORT-031). The 20 structures that comprise the NRHP-listed Ortonville Commercial Historic District are also within one mile of Morris Route 1. Other properties include three structures in Johnson, 13 in Chokio and 11 in Alberta. The Alberta Teachers House (SE ALC 007) was listed on the NRHP in 1983. In addition the U.S. Highway 12 State Line Marker (BS-OTN-005) is eligible for listing on the NRHP.

The 1850s to 1870s PLS maps show many archaeological and historic features, identified during the late 19th-century government survey, in Otrey and Moonshine townships in Big Stone County, and archaeological and historic features in Baker, Scott and Darnen townships in Stevens County. Archaeological and historic features in the vicinity of the route include one railroad (the St. Paul and Pacific Railroad), multiple unnamed trails/roads and farmsteads.

6.1.4.3 Impacts and Mitigation: Archaeological and Historic Resources

Construction of new transmission line facilities in along Morris Route 1 could impact previously-identified and currently unknown archaeological and historic resources. 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. The realized potential impacts will be determined once routes are selected.

The Project requires the preparation of an EIS directed by Western. In addition, Western will also function as the lead Federal agency for compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. Western is currently preparing a Programmatic Agreement (PA) to guide the Section 106 compliance process throughout the Project, particularly with regard to a definition of Area of Potential Effects (APE), once the routes for the transmission lines are determined. While the EIS will compare the corridors, the consulting parties to the PA understand that the selection of actual transmission line routes will be a function of the PUC. The APE, to be agreed upon in the PA, will be applied to these routes; the APE will be subject to a Phase I cultural resources inventory, including field investigation and additional archival review.

The Applicants' archaeologists will design a survey methodology to document the existing conditions within the APE, identify existing archaeological resources within that area, provide recommendations for NRHP eligibility of archaeological and historic resources within the APE and offer recommendations for archaeological site avoidance, impact minimization or mitigation if necessary.

The Applicants will make every effort to avoid impacts to identified archaeological and historic resources. In the event that an impact would occur, Western would determine the nature of the impact in consultation with the 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 was 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.

Western will integrate into the PA a discovery plan to be in place should previously unknown archaeological resources or human remains be inadvertently encountered during construction along the route. The plan will outline the framework for handling such discoveries in an efficient and legally compliant manner. The discovery plan may include the following topics: construction contractor training, identification of resources in the field, contact information for Otter Tail-designated professionals to address a discovery, procedures for avoidance and associated tasks in the event of work stoppage in a construction area. With regard to a discovery of human remains, procedures would be followed to ensure that the appropriate authorities would become involved quickly and in accordance with local and State guidelines (Minn. Stat. 307).

6.1.5 NATURAL ENVIRONMENT

6.1.5.1 Air Quality

Climate

Western Minnesota has a generally flat landscape consisting primarily of agricultural lands. Winds tend to blow stronger and more consistently in this region than they would in other parts of Minnesota. This leads to good dispersion conditions for pollutant emissions.

This particular area of the State can see notable temperature extremes throughout the year. Summer temperatures can routinely top 90 degrees Fahrenheit (°F), while winter temperatures can routinely drop below -20°F.

The same extremes can be seen for precipitation patterns. Typical summers provide abundant rainfall, while winters provide significant snowfall that result in high moisture content in the soil. However, stretches can occur where limited precipitation may fall and drought conditions can occur. Similarly, heavy precipitation events can result in lowland flooding and extreme blizzards.

The graphic in Appendix K.4 is a wind rose chart for the years 1995 to 2002 from the Watertown Municipal Airport in Watertown, South Dakota, which shows wind characteristics typical for the are around Morris Route 1.

Temperature inversions can occur any time of year due to nighttime radiational cooling or large-scale weather systems, causing cool air to get trapped near the ground. This can cause some discomfort among individuals who are sensitive to air pollutants as pollutants are not dispersed effectively during these conditions. However, temperature inversions are not a frequent and long-lived occurrence and typically do not last more than a day or two in this area. Given the low density of existing emissions sources in the region, pollutant levels during inversions do not typically approach levels of concern.

Air Quality Data

The entire area encompassing the route is currently in attainment with National and Minnesota Ambient Air Quality Standards for all criteria pollutants. In fact, the entire State of Minnesota is currently in attainment for all criteria pollutants.

No State or Federal ambient air quality monitoring sites exist within the counties along the route. The nearest monitoring site is in St. Cloud, Minnesota in Stearns County, which is downwind of Morris Route 1 to the east.

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

The Environmental Protection Agency (EPA) promulgated regulations on the permissible concentrations of ozone and oxides of nitrogen (62 Federal Register 38856). 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 7009.0080).

6.1.5.2 Water Quality

Morris Route 1 lies within the Mustinka River Watershed of the Red River of the North Basin and the Pomme de Terre River Watershed of the Minnesota River Basin. Surface water flows generally north within the Mustinka River Basin (northern Big Stone County and far western Stevens County) (MPCA 2005). Along the rest of the route, water flows south and west toward the Minnesota River. Surface water resources include the Minnesota River and tributaries to the Mustinka and Pomme de Terre rivers (many of which have been ditched), county ditches and scattered lakes. There is a large complex of lakes within the west half of Otrey Township in Big Stone County.

Individual Public Water Inventory (PWI) stream and ditch crossings are listed in Table 14. Public waters are defined in Section 13.0.

TABLE 14
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
M-3	Stony Run
	Unnamed Tributary to Otrey Lake
M-17	Unnamed stream
	County Ditch Number 3
	Tributary to County Ditch Number 2

Source: DNR 2004 Public Waters Inventory Maps

Along the proposed route alignment the transmission line will cross 53 wetlands identified by the National Wetlands Inventory (NWI); 42 of which are palustrine emergent type (FWS 2005, NWI) and eight of the wetlands are listed as Public Waters. Many of these wetlands are hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act (WCA). The number and type of NWI wetlands crossed by the proposed route alignment are shown in Table 15. Both the PWI and NWI information related to Morris Route 1 is identified on the maps in Appendix F.

TABLE 15
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland	Number of Public Water Crossings
M-1	1 palustrine emergent, 3 palustrine forested	0 crossings
M-2	5 palustrine emergent, 1 palustrine scrub/shrub, 1 palustrine unconsolidated bottom	0 crossings
M-3	1 lacustrine, 5 palustrine emergent	3 crossings (3 PWIs)
M-5	7 palustrine emergent, 3 palustrine forested, 2 palustrine unconsolidated bottom	4 crossings (3 PWIs)
M-7	5 palustrine emergent	1 crossing (1 PWI)
M-9	4 palustrine emergent	0 crossings
M-10	No wetlands	0 crossings
M-17	15 palustrine emergent	2 crossings (1 PWI)

The Clean Water Act requires states to publish, every two years, a list of streams and lakes that are not meeting their designated uses because of excess pollutants (impaired waters). The list, known as the 303(d) list, is based on violations of water quality standards. The MPCA lists the Minnesota

River on its impaired waters list for mercury and fecal coliform and Stony Run is impaired for biota (MPCA 2004).

The Minnesota River is listed as a National Park Service (NPS) Nationwide River Inventory River (NRI). The NRI lists over 3,400 river segments that the NPS has determined have "outstandingly remarkable" natural or cultural resources. Categories used to determine eligible river segments include: scenery, recreation, geology, fish, wildlife, prehistory, history, cultural values and others. Under a 1979 Presidential Directive, Federal agencies need to seek to avoid and mitigate impacts to NRI riverways. The Minnesota River is listed for its scenic, recreational, wildlife and historic values (NPS 2005).

6.1.5.3 Flora

Morris Route 1 is located within the Northern Glaciated Plains Ecoregion. The native vegetation in this ecoregion is transitional between tall and shortgrass prairie. Potential natural vegetation in prairie remnants includes western wheatgrass *(Pascopyrum smithii)*, green needlegrass *(Stipa viridula)*, big and little bluestem *(Andropogon gerandii* and *Andropogon scopdrius)*, blue grama grass *(Bouteloua gracilis)* and forbs, such as purple coneflower *(Echinacea purpurea)*, lead plant *(Amorpha canescens)* and pasque flower *(Anemone pulsatilla)* (Aaseng et al, 1993).

As a result of settlement and farming in the 1800s, much of the route vicinity has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays)*, soybeans (*Glycine max)* and wheat (*Triticum aesitivum)*; in the grazed areas, dominant vegetation includes grasses, such as smooth brome (*Bromus inermis)* and sorghum (*Sorghum vulgare)*.

The USGS Gap Analysis Program (GAP) land cover types along Morris Route 1 are shown in Table 16. The GAP land cover data shows that approximately 95 percent of the land along the proposed route alignment is in agricultural uses. Land cover types are defined in Appendix I.1.

TABLE 16
GAP LAND COVER – PROPOSED ROUTE

Cover Type	Area (acres)	Percent of Route
Agriculture	8,339	94.8
Wetland/Riparian/Open Water	393	4.5
Forest	48	0.5
Shrubland	0.10	0.0
Prairie	15	0.2
Developed	0.10	0.0

Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data

Along the route, there are several areas where natural vegetation is being managed. Managed areas such as WMAs and WPAs were analyzed within one mile of the route alignment. These resources provide potential habitat for native vegetation, wildlife and rare and unique resources. A distance of one mile was used because studies have shown that impacts to wildlife (particularly waterfowl) are negligible at distances greater than one mile from wildlife habitat (Avian Power Line Interaction Committee, 1994). Otrey WMA contains marsh vegetation, such as sedges and cattails, with areas of open water interspersed. Prairie WMA is predominantly grassland with an open water lake. The grassland vegetation is likely made up of species found in idle pastureland and grassland, such as smooth brome *(Bromus inermis),* but could include remnants of native prairie species (DNR 2005). There are four FWS WPAs (Prairie, Redhead Marsh, Schultz and Twin Lakes), located along the route, containing wetland and grassland vegetation. The route alignment crosses Twin Lake WPA. Within one mile of the route alignment, there are five additional WMAs, (Reisdorph, Victory, Thomson, Malta and Brouillet), and six additional WPAs, including Tangen, Jorgenson, Larson Slough, Thomson, Dismal Swamp and Jacobson.

Along the route alignment, there are approximately 93 acres of FWS easements. The FWS holds tillage, cropping and disturbance rights to the upland, and protects the wetlands on these lands, which are used for waterfowl production. The landowner retains rights to graze and hay land. There are approximately 653 acres of FWS wetland easements along the route. The FWS retains the rights to burn, level and fill all wetlands in these lands. The landowner retains all control over the uplands in these easements.

Within the route, there are 13 native plant communities listed by the DNR: 12 mesic prairie communities and one dry hill prairie community, all in Big Stone County. Within one mile of Morris

Route 1, there are 37 additional natural communities listed by the DNR (Minnesota Natural Heritage and Nongame Wildlife Program 2005). DNR data describing railroad prairies was also analyzed for the route. Results of the analysis are given in Section 6.1.6. Appendix M lists plant species found in these native plant communities. An initial survey was conducted in June 2005 to identify remnant prairies and potential threatened and endangered species habitat. The results of this survey are discussed in Section 6.1.6.

6.1.5.4 Fauna

Although 95 percent of the land adjacent to Morris Route 1 is cultivated, there are several WMAs and WPAs along the route that provide habitat for a variety of animal species. The WMAs 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 WMAs include songbirds, small game mammals, such as squirrels *(Sciuridae* family) and rabbits, and non-game animals, such as mice and voles (*Muridae* family). The populations of game species, such as white-tailed deer, pheasants and turkeys, have been increasing in the counties within the Project area (Schuna, 2005; Soehren, 2005; Bartling, 2005; Zajac, 2005). The WPAs 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. The Big Stone National Wildlife Refuge is located along the Minnesota River within one mile of the southern end of Morris Route 1. The 11,521-acre refuge consists of tallgrass prairie and wetland habitats and is managed to preserve fish, mammals, waterfowl, shorebirds and grassland birds. Wildlife found in this preserve includes bluebirds *(Sialia sialis)*, warblers *(Parulidae* family) and other songbirds, pheasants, ducks *(Anatidae* family) and other waterfowl, herons *(Ardeidae* family) and other colonial water birds, turkeys, prairie chickens *(Tympanuchus cupido)*, gray partridges *(Perdix perdix)*, white-tailed deer, rabbits, squirrels, muskrats *(Ondatra zibethica)*, beavers *(Castor canadensis)* and river otters *(Lutra canadensis)*. Reptiles and amphibians are common in the wetland portions of the refuge (FWS 2004).

Most of the route is adjacent to cultivated land, which provides some cover for the common fauna known to inhabit Minnesota. Wildlife in Morris Route 1 consists of birds, mammals, fish, reptiles, amphibians, mussels and insects, both resident and migratory, which use the area habitat for forage, shelter, breeding habitat and/or stopover during migration. Species include those found in agricultural landscapes, prairie remnants, pasture, grasslands, wetland and riverine habitats. Common mammals for these habitats include raccoon *(Procyon lotor)*, mink *(Mustela vison)*, skunk *(Mephitis spp.)*, weasel *(Mustela nivalis)*, white-tailed deer *(Odocorleus virginianus)*, coyote *(Canis latrans)*, red fox *(Vulpes vulpes)*, badger *(Mustilidae* family), porcupine *(Erethizon dorsatum)* and rabbit *(Syvilagus spp.)*. Common birds include songbirds, waterfowl and game birds, such as pheasant *(Phasianus* *colchinus)* and turkey *(Meleagus gallopavo)*. A list of mammals, birds, reptiles, amphibians and fish known to occur in habitats of this region of Minnesota is included as Appendix M.2.

The Minnesota River Valley is recognized as a major flyway for migrating birds and more than 320 species of birds have been recorded in the valley. The Migratory Bird Treaty Act (MBTA) of 1918 (16 USC 703-712) governs the taking, killing, possession, transportation and importation of migratory birds, their eggs, parts and nests. Such actions are prohibited unless authorized under a valid permit. This law applies to migratory birds native to the U.S. and its territories. It does not apply to non-native migratory birds or resident species that do not migrate on a seasonal basis. Additionally, the 1940 Bald and Golden Eagle Protection Act (16 USC 668-668C) specifically prohibits the taking or possession of and commerce in bald eagles (*Haliaeetus leucocephalus*) and golden eagles (*Aquila chrysaetos*), either alive or dead, or any part, nest or egg of these eagles. Special exceptions to this prohibition may be granted by a permit from the Secretary of the Interior for scientific or exhibition purposes, for religious purposes of Native American tribes or for the protection of wildlife or other interests. There have been several sightings of bald eagles within or in the vicinity of the route alignment; Section 6.1.6 discusses this species in more detail.

The DNR and FWS recently (June 2005) released the results of a joint assessment for the conservation of wetlands and grasslands in Minnesota, which identify grassland and wetland habitat priorities for wildlife conservation. The joint assessment identifies potential areas for conservation and is a measurement of the integrity of the landscape for a full array of wetland and grassland wildlife species. The model that was developed for this joint assessment identifies 40-acre parcels within the corridors that are high priority areas for the conservation of wetland and grassland wildlife species. The building wildlife species are "focal species," or species that use habitats similarly to a large group of species, but are believed to be more sensitive to a combination of site and landscape factors than other species. The high priority areas identified by the joint assessment could also be due to their importance to one or two species; however, they could also be high priority because of their moderate importance to many focal species. The high priority areas are identified in Appendix K.5 Segment M-1, M-2, M-3 and portions of M-5 alignments are within high priority areas for both grassland and wetland habitats (FWS and DNR 2005).

The FWS has also reintroduced several populations of prairie chickens (a State species of special concern) within one mile of Morris Route 1. Sections 25, 26 and 36 of Big Stone Township contain signed areas of prairie chicken habitat and specific lookouts. There is a FWS-documented booming ground, or lek, in Section 25, where adult prairie chickens congregate communally on breeding display grounds in the spring. In general, these sites correspond to areas that have been determined by the DNR to have outstanding biodiversity significance. The area of the route in Otrey and Malta townships is identified as a high priority area for conservation.

There are two colonial waterbird rookeries within one mile of Morris Route 1 in Big Stone County. One of the documented rookeries contains western grebe *(Aechmophorus occidentalis);* the other contains double-breasted cormorants *(Phalacrocorax auritus)* (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Because of the high density of birds in such rookeries, any disturbance to the site has the potential to impact the reproductive success of large portions of a species' population.

6.1.5.5 Impacts and Mitigation: Natural Environment

Air Quality

Studies designed to monitor the production of ozone under transmission lines have generally been unable to detect any increase in ozone levels (VDH, 2003; USDOE 1996). Given this, there will be no measurable impacts relating to ozone in the corridors. Temporary and localized impacts to air quality may occur during construction due to the disturbance of soil, which raises fugitive dust particles.

Temporary impacts from fugitive dust will be minimized or avoided by 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 are made.

Water Quality

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

Several streams and rivers will be crossed by the route. A Section 10 permit will be obtained from the U.S. Army Corps of Engineers (USACE) for the Minnesota River crossing. The Applicants will obtain utility crossing permits from the DNR for any PWI water crossed.

Temporary impacts to wetlands may occur if they need to be crossed during construction of the transmission line. No staging or stringing set up areas will be placed adjacent to water resources, as practical. The Applicants will attempt to span wetlands along the route. The maximum span of the proposed structures is approximately 1,000 feet. Permanent impacts to wetlands are possible along

Segments M-1, M-5 and M-17, where the proposed route alignment spans wetlands wider than 1,000 feet. It is anticipated that a maximum of one structure may be placed in each of these wetlands, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact in each wetland, or 3,000 square feet (0.069 acres) total. Approximately 20,000 square feet (0.46 acres) of temporary wetland impact would occur for each structure. The Applicants will obtain Section 404 permits from the USACE and will comply with the WCA, as applicable.

The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements. Practices may include:

- Containment of stockpiled material away from stream banks and lake shorelines.
- Stockpiling and respreading topsoil.
- Reseeding and revegetating disturbed areas as required by the NPDES permit.
- Implementing erosion and sediment controls as required by the NPDES permit.
- Structures and disturbed areas will be located 300 feet from rivers and lakes, where practical.
- Waste water from concrete batching or other construction operations will not enter streams or other surface waters without using turbidity control methods. Waste waters discharged will be free of settleable material.

The Applicants will avoid major disturbance of individual wetlands and drainage systems during construction. This will be done by spanning wetlands and drainage systems, where possible. When it is not possible to span the wetland, the Applicants will draw on several options during construction to minimize impacts:

- When possible, construction will be scheduled during frozen ground conditions.
- Crews will attempt to access the wetland with the least amount of physical impact to the wetland (i.e., shortest route).
- The structures will be assembled on upland areas before they are brought to the site for installation, when practical.
- When construction during winter is not possible, construction mats will be used where wetlands would be impacted. Additionally, the Applicants have access to an all-terrain construction vehicle that may be used, which is designed to minimize soil impact in damp areas. Wetlands impacted will be restored as required by the USACE and WCA.

Flora

Flora within habitats along most of the route is typical of what will be found in an agricultural setting. Since Morris Route 1 will occur along an existing transmission line adjacent to roads and agricultural lands that have been previously disturbed, impacts to native vegetation are anticipated to be minimal. The Applicants will span areas containing natural communities wherever possible. The Applicants intend to and will work diligently to avoid any direct impacts to WMAs within the route, as practical. The Applicants will likewise attempt to avoid placing structures in Prairie, Schultz and Redhead Marsh WPAs; however, because the transmission line crosses through Twin Lakes WPA for a distance greater than 1,000 feet, it is likely that structures will be placed within that resource. Using the maximum span of 1,000 feet, it is estimated that six structures will be placed within that resource. If impacts do occur to Twin Lakes WPA or any other WPA along the route, the Applicants will coordinate with the FWS in order to minimize disturbance to the habitat and will discuss appropriate mitigation. Impacts to WPAs and any Federally-funded WMAs require coordination with the FWS. A compatibility analysis will need to be performed to show that construction of the transmission line would not interfere with the purpose of the resources (in these cases, providing habitat for wildlife and waterfowl). The Applicants would coordinate with the DNR regarding any impacts or easements to State lands (MAs and SNAs). The Applicants would continue to work with the FWS and DNR in order to avoid impacts, and if impacts are unavoidable they will be minimized and mitigated.

The applicants estimate that easements will also be required within Schultz WPA (4.3 acres) and Twin Lakes WPA (17.6 acres). Approximately 7.3 acres of easements within FWS habitat easements will also likely be required. No easements within Federally-funded WMAs are anticipated.

Two of the DNR-listed natural communities will possibly be impacted by the proposed route alignment due to their width of greater than 1,000 feet: one mesic prairie community along the Segment M-2 alignment and one mesic prairie community along the Segment M-3 alignment.

The Applicants will continue to work with the DNR and FWS to minimize and avoid impacts to sensitive flora along the route alignment. The Applicants will survey the approved route for threatened and endangered species and will span any areas found to contain rare species. When native vegetation communities cannot feasibly be spanned, the Applicants will minimize the number of structures within these lands and will survey the approved route for threatened and endangered species within the ROW of the approved route. 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.

Fauna

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.

Throughout the routing process the Applicants met and corresponded with staff from the DNR and FWS to discuss the agencies' concerns.

Raptors, waterfowl and other bird species may also 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. Along Morris Route 1, Segments M-1, M-2, M-3 and the southern portion of M-5 pass 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 Applicants recognize that the FWS and DNR are concerned about this area and will continue to work with these agencies to address their concerns.

Additionally, electrocution of large birds, such as raptors, is a concern typically related to distribution lines. Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. The Applicants' transmission line design standards provide adequate spacing to eliminate the risk of raptor electrocution. As such, electrocution is not a concern related to the Project.

Although the proposed route will go relatively near prairie chicken nesting areas, it is a rebuild of an existing transmission line and therefore should not increase opportunities for predation over existing levels. In fact, with the proposed structures, longer spans are anticipated, decreasing the number of potential perching sites.

To mitigate possible impacts to wildlife within WMAs and WPAs, the Applicants will span these habitats wherever feasible. In areas where complete spanning is not possible, the Applicants 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 Applicants 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 and is free of noxious weeds.

The Applicants will also address avian issues for Morris Route 1 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.

6.1.6 RARE AND UNIQUE NATURAL RESOURCES

Table 17 lists the rare or unique resources identified within one mile of Morris Route 1. These resources were identified using the DNR Natural Heritage Database.

TABLE 17
RARE AND UNIQUE RESOURCES

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Red Tailed Prairie Leafhopper	1	*Aflexia rubranura*	Not Listed	SPC	S3	Dry to wet mesic prairie; host plant prairie dropseed
Carolina Foxtail	2	*Alopecurus carolinianus*	Not Listed	NON	NR	Wet meadows, wet prairies
Slender Milk-vetch	1	*Astragalus flexuosus*	Not Listed	SPC	S3	Mesic and dry mesic prarie
Arogos Skipper	1	*Atrytone arogos*	Not Listed	SPC	S3	Undisturbed grasslands, prairies, sand prairies; caterpillar host is big bluestem
Upland Sandpiper	3	*Bartramia longicauda*	Not Listed	NON	S4	Dry prairies
Larger Water-starwort	1	*Callitriche heterophylla*	Not Listed	SPC	S3	Shallow water or mud of springs and stream pools
Mouse-ear Chickweed	1	*Cerastium brachypodum*	Not Listed	NON	NR	Dry oak savannah
Colonial Waterbird Nesting Site	2	*Colonial Waterbird Nesting Area*	Not Listed	None	NR	
Prairie Mimosa	1	*Desmanthus illinoensis*	Not Listed	SPC	S3	Margins of shallow prairie lakes
Three Stamened Waterwort	2	*Elatine triandra*	Not Listed	NON	NR	Mud flats or floating in shallow waters of lakes & ponds
Ball Cactus	6	*Escobaria vivipara*	Not Listed	END	S1	Rock outcrops
Dakota Skipper	1	*Hesperia dacotae*	Candidate	THR	S2	Wet prairie and dry prairie dominated by bluestem grasses
Mudwort	2	*Limosella aquatica*	Not Listed	SPC	S3	Stream banks, shallow margins of prairie ponds and rock pools
Forget-me-not	3	*Myosotis verna*	Not Listed	NON	NR	Clearings in dry woods
Mousetail	2	*Myosurus minimus*	Not Listed	NON	S4	Shallow still or slowly flowing waters. Muddy or sandy shorelines and areas with fluctuating water levels
Powesheik Skipper	2	*Oarisma powesheik*	Not Listed	SPC	S3	Wet mesic prairie with native grasses, sedges and a significant number of plants in the sunflower family
Tumblegrass	1	*Schedonnardus paniculatus*	Not Listed	SPC	S3	Tallgrass prairies

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Regal Fritillary	1	*Speyeria idalia*	Not Listed	SPC	S3	Large grassland areas or lightly grazed pasture lands with prairie remnants. Larval plants are violets.
Dry Prairie (Southwest) Hill Subtype	7		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	36		Not Listed	None	S2	
Rock Outcrop (Southwest) Subtype	7		Not Listed	None	SNR	

** 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

Many of the rare and unique resources identified along Morris Route 1 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

Due to the size of the Project and not knowing what route would be chosen, a survey approach was developed and approved by the DNR to identify potential habitats containing threatened and endangered species (Section 10.1.2). The survey identified prairie and rock outcrop communities as the two habitats most likely contain threatened and endangered species near the Project. An initial survey, conducted in June 2005 and October 2005, identified prairies and rock outcrops along the proposed route. The survey identified five remnant prairie communities crossed by the Morris Route 1 alignment: one mesic prairie community and one dry prairie community along the Segment M-2 alignment, and three mesic prairie communities along the Segment M-3 alignment (GES 2005).

The DNR Minnesota County Biological Survey (MCBS) data was consulted to determine if there were areas with medium, high or outstanding biodiversity significance along the proposed route. Areas with medium biodiversity significance are those containing significant occurrences of rare species and/or moderately-disturbed native plant communities and landscape that have a strong potential for recovery. Areas with high biodiversity significance contain sites with very good quality occurrences of the rarest plant communities and/or important functional landscapes. Areas with outstanding biodiversity significance contain the best occurrence of the rarest species; the most outstanding example of the rarest native plant communities and/or the largest, most intact functional landscapes present in Minnesota. Within the route, there are 10 areas with moderate biodiversity significance, one area with high biodiversity significance and four areas with outstanding biodiversity significance. These areas are identified on the detailed route maps (Appendix F). There are no DNR-listed railroad prairies in the vicinity of Morris Route 1.

6.1.6.1 Impacts and Mitigation: Rare and Unique Natural Resources

A search of the DNR's Minnesota Natural Heritage Database identified one instance of a Federal candidate State threatened species [Dakota skipper (*Hesperia dacotae*)], six instances of a State endangered species [Ball cactus (*Escobaria vivipara*)] and 11 species of special concern within one mile of the proposed route alignment. Most of the instances identified by the Natural Heritage Database occur within the DNR's WMAs along the route alignment. Fifty DNR-listed natural communities are within one mile of the proposed route alignment.

There are two DNR-listed natural communities (mesic prairie subtypes) wider than 1,000 feet along the proposed route alignment: one along the Segment M-2 alignment and one along the Segment M-3 alignment. These sites correspond to areas listed as having moderate biodiversity significance. The number of structures placed in these areas will be minimized by maximizing the span length or replacing structure for structure. However, because the Dakota skipper is a prairie species, it is possible that habitat could be affected by placing structures in these mesic prairie communities. Many of the special concern species are also associated with prairies and could therefore be affected.

The Applicants will span any habitats where native prairie fragments or other unique plant communities have been recorded or could occur, as practical. A survey for special status species will be conducted once a route alignment is approved. Along Morris Route 1, the Applicants should be able to span all rock outcrops, thereby avoiding impacts to the ball cactus. If construction within outcrops cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to the ball cactus or any other listed species are avoided or minimized. Four of the surveyed remnant prairie communities (the two communities along the Segment M-2 alignment and two of the communities along the Segment M-3 alignment) will likely be impacted by the route because they are wider than 1,000 feet.

Several of the listed special concern species 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 Applicants will span streams and wetlands along the route, whenever feasible. Whenever it is not feasible to span, a survey will be conducted to determine the presence of special status species and coordination will occur with the appropriate agencies to avoid and minimize any impact. The Applicants 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.

6.2 MORRIS ROUTE 2

6.2.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The environmental setting for Morris Route 2 is essentially the same as that for Morris Route 1 (Section 6.1.1).

6.2.2 HUMAN SETTLEMENT

6.2.2.1 Public Health and Safety

In general, public health and safety for Morris Route 2 is essentially the same as that for Morris Route 1 (Section 6.1.2.1).

6.2.2.2 Commercial, Industrial and Residential Land Use

In general, land use along Morris Route 2 is similar to that along Morris Route 1 (Section 6.1.2.2). Notable differences in land use along Route 2 are documented below.

Table 18 shows that over 95 percent of the land in Morris Route 2 is used for agriculture. Segments M-4, and M-6, M-8, and M-18 encompass the majority of the agricultural land due to their location and length. Wetland/riparian/open water areas are found mostly along Segments M-2, M-4, and M-6. Appendix I.1 defines the land use types identified in Table 18. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 18
GAP LAND USE DATA FOR MORRIS ROUTE 2

Land Use Types	Total	
	Area (acres)	Percent of Route
Agriculture	96,16.10	95.49
Wetland/Riparian/Open Water	377.70	3.75
Forest	53.15	0.53
Shrubland	4.55	0.05
Prairie	19.15	0.19
Developed	0.08	<0.01
Total	10,070.73	100

Stevens County

General land use in Stevens County, including schools, churches, cemeteries and airports, is essentially the same along Morris Route 2 as along Morris Route 1.

Big Stone

General land use in Big Stone County, including schools, churches, cemeteries and airports, is essentially the same along Morris Route 2 as along Morris Route 1.

6.2.2.3 Displacement

There is one home on Morris Route 2 that is located within 100 feet of the route alignment of the proposed transmission line. There are 10 homes along Morris Route 2 that are within 300 feet but farther than 100 feet from the proposed transmission line.

6.2.2.4 Noise

In general, noise for Morris Route 2 is essentially the same as that for Morris Route 1 (Section 6.1.2.4).

6.2.2.5 Aesthetics

The potential aesthetic impacts from Morris Route 2 are essentially the same as for Morris Route 1, with the exception that 22 homes are located within 500 feet of the Morris Route 2 alignment.

6.2.2.6 Socioeconomic

The socioeconomic information for Morris Route 2 is essentially the same as Morris Route 1. See Section 6.1.2.6 for the socioeconomic information related to Morris Route 2.

6.2.2.7 Cultural Values

The methods used to identify cultural resources are discussed in Section 6.1.2.7. Cultural values listed for Morris Route 1 are applicable to Morris Route 2.

6.2.2.8 Recreation

As stated in Section 6.1.2.8, there are a variety of outdoor recreational opportunities along the route. Appendix K.3 shows the locations of WMAs within the vicinity of the routes. The detailed route maps in Appendix F identify the WMAs in more detail. The Big Stone National Wildlife Refuge is within one mile of the proposed route alignment. There are four WMAs within the route: Prairie, Reisdorph, Thomson and Freed. Within one mile of the route alignment, there is one additional WMA: Thielke Lake. There are four FWS WPAs (Prairie, Redhead Marsh, Dismal Swamp and Twin Lakes), located along the route. Within one mile of the route alignment, there are four additional WPAs, including Odden, Bentson Lake, Larson Slough and Tangen. The proposed route alignment crosses five snowmobile trails: one in the Segment M-1 alignment east of Ortonville, one in the Segment M-13 alignment, one in the Segment M-14 alignment and two in the Segment M-18 alignment. The Minnesota River Valley Birding Trail crosses through the proposed route on U.S. Highway 10 (on the Segment M-4 alignment). The proposed route alignment also crosses U.S. Highway 75.

6.2.2.9 Public Services

Morris Route 2 includes Stevens and Big Stone counties and four communities within one mile of the proposed route alignment: Alberta, Chokio, Johnson, and Ortonville. This is a rural area and Ortonville is the primary community 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. For a discussion of potential airport conflicts see Section 6.1.2.2.

6.2.2.10 Impacts and Mitigation: Human Settlement

Public Health and Safety

See Section 6.1.2.10 for potential impacts and mitigation measures related to public health and safety along Morris Route 2. The Applicants will ensure that safety requirements are met during the construction and operation of the facility. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the pole locations), impacts will be minimal and no mitigation is anticipated.

Coordination with local government representatives would likely be necessary to address any conflicts between the route and the proposed new runway approach safety zones for the Ortonville airport.

Displacement

The Applicants will work with landowners to make alignment adjustments to avoid any displacements. No displacement is anticipated.

Noise

See Section 6.1.2.10 for potential impacts and mitigation measures related to noise along Morris Route 2.

Aesthetics

See Section 6.1.2.10 for potential impacts and mitigation measures related to aesthetics along Morris Route 2.

Socioeconomic

See Section 6.1.2.10 for potential impacts and mitigation measures related to socioeconomic resources along Morris Route 2. Permanent impacts to agricultural lands is estimated at 7.3 acres for Morris Route 2.

Cultural Values

See Section 6.1.2.10 for potential impacts and mitigation measures related to cultural values along Morris Route 2.

Recreation

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants intend to and will work diligently to avoid any direct impacts to WMAs and WPAs within the route. However, an easement may still be required due to the proximity of the route alignment to the resources. The Applicants estimate that easements will be required within Twin Lakes WPA (approximately 0.17 acres) and Dismal Swamp WPA (approximately 1.2 acres). Easements in Reisdorph WMA (0.2 acres) and Thomson WMA (0.3 acres) will also likely be needed. The proposed transmission line will likely be visible from the northern edge of the Big Stone National Wildlife Refuge, the WMAs and WPAs within one mile, the Minnesota River Valley Birding Trail and U.S. Highway 75. The route will not interfere with the use of those recreational resources.

Public Services

No impact is expected to public services along Morris Route 2.

6.2.3 LAND-BASED ECONOMICS

6.2.3.1 Agriculture

Along Morris Route 2, approximately 95 percent of the land is used for agriculture (USGS 2004) and approximately 96 percent of the soils are listed by the NRCS as prime farmland, prime when drained or farmland of statewide importance (USDA NRCS 2005).

Section 6.1.6.1 describes the agricultural resources of Big Stone and Stevens counties.

There are no center-pivot irrigation systems along Morris Route 2.

6.2.3.2 Forestry

Morris Route 2 occurs in what was historically the Prairie Grassland region of Minnesota. The primary tree cover in the Project area is associated with waterways and homesteads. No economically important forestry resources are within the Project area.

6.2.3.3 Tourism

See Section 6.1.3.3 for a general discussion of tourism resources along Morris Route 2.

6.2.3.4 Mining

See Section 6.1.3.4 for a general discussion of mining resources along Morris Route 2.

6.2.3.5 Impacts and Mitigation: Land-Based Economies

Agriculture

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the route alignment (Appendix D). The Applicants estimate permanent impacts to agricultural lands at approximately 7.3 acres for the proposed route. Approximately 95 percent of the impacts to agricultural land would occur on prime farmland soils or soils of statewide importance. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur.

The Applicants estimate that approximately 237 acres of agricultural land will be impacted temporarily by Morris Route 2 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route; impacts are estimated at approximately 8.0 acres. Section 6.1.2 describes the land use impacts for the route in more detail.

No impacts to central pivot irrigation are expected along Morris Route 2. The Applicants will work with landowners to minimize impacts to farming operations along the route alignment, such as by aligning the transmission line along section and field lines. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Forestry

See Section 6.1.3.5 for potential impacts and mitigation measures related to forestry along Morris Route 2. Impacts along the route to shelterbelts are estimated at 9.2 acres.

Tourism

No impacts to area tourism are anticipated from the presence of the transmission line and no mitigation is necessary.

Mining

Based on a review of existing information, Morris Route 2 would not impact active mining or quarrying operations. No mitigation is necessary.

6.2.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

The methods used to identify archaeological and historic resources are discussed in Section 6.1.4. Additionally, based on these methods, the archaeological and historic resources along Morris Route 2 are the same as depicted in Section 6.1.4.

6.2.4.1 Impacts and Mitigation: Archaeological and Historic Resources

See Section 6.1.4.1 for potential impacts and mitigation measures related to archaeological and historic resources along Morris Route 2.

6.2.5 NATURAL ENVIRONMENT

6.2.5.1 Air Quality

See Section 6.1.5.1 for a general discussion of air quality along Morris Route 2.

6.2.5.2 Water Quality

See Section 6.1.5.2 for a general discussion of watershed and surface water resources along Morris Route 2.

The Minnesota River is listed as a NPS NRI river for its scenic, recreational, wildlife and historic values (NPS 2005).

Individual Public Waters (stream and ditch crossings) are listed in Table 19. Public waters are defined in Section 13.0.

TABLE 19
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
M-4	Unnamed Tributary to Stony Run Unnamed Tributary to Otrey Lake Stony Run
M-13	Unnamed stream West Fork of Twelve Mile Creek
M-18	Unnamed Tributary to Muddy Creek County Ditch Number 3 Tributary to County Ditch Number 2

Source: DNR 2004. Public Water Inventory Maps

Along the proposed route alignment the transmission line will cross 31 wetlands identified by the NWI, 24 of which are palustrine emergent type (FWS 2005, National Wetland Inventory). Two of the wetlands are listed as Public Waters. Many of these wetlands are hydrologically-connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the WCA. The number and type of NWI wetlands crossed by the proposed route alignment are shown in Table 20. Both the PWI and NWI information related to the proposed route alignment is identified on the maps in Appendix K.

TABLE 20
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland	Number of Public Water Crossings
M-1	1 palustrine emergent, 3 palustrine forested	0 crossings
M-2	5 palustrine emergent, 1 palustrine scrub/shrub, 1 palustrine unconsolidated bottom	0 crossings
M-4	2 palustrine emergent	1 crossing
M-6	1 palustrine emergent, 1 palustrine unconsolidated bottom	1 crossing
M-8	6 palustrine emergent	0 crossings
M-9	4 palustrine emergent	0 crossings
M-11	No wetland crossings	0 crossings
M-13	1 palustrine emergent	0 crossings
M-14	1 palustrine unconsolidated bottom	0 crossings
M-18	4 palustrine emergent	0 crossings

The MPCA lists the Minnesota River on its impaired waters list for mercury and fecal coliform (MPCA 2004).

6.2.5.3 Flora

Morris Route 2 is located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.4 describes the native vegetation that can be found in prairie remnants within this ecoregion, as well as the crops grown in agricultural areas.

The USGS GAP land cover types along the proposed route alignment are shown in Table 21. The GAP land cover data shows that approximately 95 percent of the land along the proposed route alignment is in agricultural uses. Appendix I.1 lists the specific GAP categories that make up the general cover types shown below.

TABLE 21
GAP LAND COVER – MORRIS ROUTE 2

Cover Type	Area (acres)	Percent of Route
Agriculture	9,364	95.4
Wetland/Riparian/Open Water	378	3.8
Forest	55	0.6
Shrubland	5	0.0
Prairie	19	0.2
Developed	0.08	0.0

Source: USGS 2004. Upper Midwest GAP Analysis Program Landcover Data

Along the route, there are several areas where natural vegetation is being managed. Otrey WMA contains marsh vegetation, such as sedges and cattails, with areas of open water interspersed. Freed contains grassland and wetland vegetation, Thomson contains marsh with open waters vegetation and Reisdorph contains grassland and wetland vegetation with several open water lakes (DNR 2005). There are four FWS WPAs (Prairie, Redhead Marsh, Dismal Swamp and Twin Lakes) located along the route, containing wetland and grassland vegetation. The route alignment does not cross the WMAs or WPAs. Within one mile of the route alignment, there is one additional WMA: (Thielke Lake) and four additional WPAs, including Odden, Bentson Lake, Larson Slough and Tangen.

Along the route, there are approximately 886 acres of FWS wetland easements.

Along the route, there are six native plant communities listed by the DNR: six mesic prairie communities along the Segment M-2 alignment and two mesic prairie communities along the Segment M-4 alignment. Within one mile of the proposed route alignment, there are 19 additional natural communities listed by the DNR (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Appendix M.1 describes the plant species found within these natural communities.

6.2.5.4 Fauna

Although 95 percent adjacent to the proposed route alignment is cultivated, there are several WMAs and WPAs along the route that provide habitat for a variety of animal species. The Big Stone National Wildlife Refuge is located along the Minnesota River within one mile of the southern end of the proposed route. Section 6.1.5.5 describes the wildlife species typically found in WMAs and WPAs and in the Big Stone National Wildlife Refuge.

Most of the route is adjacent to cultivated land, which provides some cover for the common fauna known to inhabit Minnesota. A discussion of common wildlife along the route can be found in Section 6.1.5.4, and a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

The high priority areas from the joint assessment are identified in Appendix K.5. See Section 6.1.5.4 for a discussion on the DNR and FWS joint assessment. Segment M-1, M-2, M-4, M-6 and a portion of M-8 alignments cross areas designated as high priority for both wetland and grassland habitat (FWS and DNR 2005).

The area of the route in Otrey and Malta townships is identified as a high priority area for conservation. Section 6.1.5.4 discusses the prairie chicken populations along the route.

There is one colonial waterbird rookery within one mile of the route alignment in Big Stone County. Western grebes inhabit this rookery (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Because of the high density of birds in such rookeries, any disturbance to the site has the potential to impact the reproductive success of large portions of a species' population.

6.2.5.5 Impacts and Mitigation: Natural Environment

Air Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to air quality along Morris Route 2.

Water Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to water quality along Morris Route 2. For Morris Route 2, permanent impacts to wetlands are possible along the Segment M-1 alignment, since the wetland it spans is wider than 1,000 feet. It is anticipated that a maximum of one structure may be placed in this wetland, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact. Approximately 20,000 feet (0.46 acres) of temporary wetland impact would occur with the placement of one structure.

Flora

As stated in Section 6.1.5.5, native vegetation is anticipated to be minimal and impacts to WPAs and Federally-funded WMAs may require a compatibility analysis.

The Applicants estimate that easements will be required within Twin Lakes WPA (approximately 0.17 acres) and Dismal Swamp WPA (approximately 1.2 acres). Easements will also likely be required in the following Federally-funded WMAs: Reisdorph (0.2 acres) and Thomson (0.3 acres). No easements within FWS wetland or habitat easements are anticipated.

Two of the DNR-listed natural communities will possibly be impacted by the route alignment due to their width of greater than 1,000 feet: one mesic prairie community along the Segment M-2 alignment and one mesic prairie community along the Segment M-4 alignment.

Fauna

As stated in Section 6.1.5.5, there is minimal potential for the displacement of wildlife and loss of habitat from construction of Morris Route 2.

Similar to Morris Route 1, avian collisions are a possibility after construction. Segment alignments M-1, M-2, M-4, M-6 and a portion of M-8 pass 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. As stated in Section 6.1.5.5, the Applicants recognize that the FWS and DNR are concerned about this area and will continue to work with these agencies to address their concerns.

See Section 6.1.5.5 for potential impacts mitigation measures related to fauna along Morris Route 2.

6.2.6 RARE AND UNIQUE NATURAL RESOURCES

Table 22 lists the rare or unique resources identified within one mile of Morris Route 2. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Morris Route 2 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 22
RARE AND UNIQUE RESOURCES

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Carolina Foxtail	2	*Alopecurus carolinianus*	Not Listed	NON	NR	Wet meadows, wet prairies
Upland Sandpiper	1	*Bartramia longicauda*	Not Listed	NON	S4	Dry prairies
Larger Water-starwort	2	*Callitriche heterophylla*	Not Listed	SPC	S3	Shallow water or mud of springs and stream pools
Mouse-ear Chickweed	1	*Cerastium brachypodum*	Not Listed	NON	NR	Dry oak savannah
Colonial Waterbird Nesting Site	1	*Colonial Waterbird Nesting Area*	Not Listed		NR	
Prairie Mimosa	1	*Desmanthus illinoensis*	Not Listed	SPC	S3	Margins of shallow prairielakes
Three Stamened Waterwort	2	*Elatine triandra*	Not Listed	NON	NR	Mud flats or floating in shallow waters of lakes and ponds
Ball Cactus	1	*Escobaria vivipara*	Not Listed	END	S1	Rock outcrops
Mudwort	2	*Limosella aquatica*	Not Listed	SPC	S3	Stream banks, shallow margins of prairie ponds and rock pools
Forget-me-not	3	*Myosotis verna*	Not Listed	NON	NR	Clearings in dry woods
Mousetail	2	*Myosurus minimus*	Not Listed	NON	S4	Shallow still or slowly flowing waters. Muddy or sandy shorelines and areas with fluctuating water levles
Tumblegrass	1	*Schedonnardus paniculatus*	Not Listed	SPC	S3	Tallgrass prairies
Dry Prairie (Southwest) Hill Subtype	1	Dry Prairie (Southwest) Hill Subtype	Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	25	Mesic Prairie (Southwest) Subtype	Not Listed	None	S2	
Rock Outcrop (Southwest) Subtype	7	Rock Outcrop (Southwest) Subtype	Not Listed	None	NR	

** 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

The DNR MCBS data was consulted to determine if there were areas with medium, high or outstanding biodiversity significance along the route. Within the route, there are seven areas with moderate biodiversity significance, one area with high biodiversity significance and one area with outstanding biodiversity significance. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Morris Route 2.

An initial survey conducted in June 2005 identified three remnant prairie communities: one mesic prairie community and one dry prairie community along the Segment M-2 alignment and one mesic prairie community along the Segment M-4 alignment (GES 2005).

6.2.6.1 Impacts and Mitigation: Rare and Unique Natural Resources

A search of the DNR's Minnesota Natural Heritage Database identified one instance of a State endangered species (ball cactus) and four species of special concern within one mile of the route alignment. Most of the instances identified by the Natural Heritage Database occur within the DNR's WMAs along the route alignment. Thirty-three DNR-listed natural communities are within one mile of the proposed route alignment.

The Applicants will attempt to span any habitats where native prairie fragments or other unique plant communities have been recorded or could occur. A survey for special status species will be conducted once a route alignment is approved.

The ball cactus, a State endangered species, occurs in rock outcrops. Along Morris Route 2, the Applicants should be able to span all rock outcrops. If construction within outcrops cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

There is one DNR-listed natural community (mesic prairie subtypes) wider than 1,000 feet along the Segment M-2 alignment. This site corresponds to an area listed as having moderate biodiversity significance. Another area mapped as having moderate biodiversity significance along the Segment M-4 alignment is wider than 1,000 feet; it is likely that structures will be placed in this area. The number of structures placed in these areas will be minimized by maximizing the span length or replacing structure for structure. However, several of the special concern species are prairie species; it is possible that habitat could be affected by placing structures in these mesic prairie communities.

Several of the listed special concern species 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 Applicants will attempt to span streams and wetlands along the route whenever feasible. Whenever it is not feasible to span, a survey will be conducted to determine the presence of special status species and coordination will occur with the appropriate agencies to avoid and minimize any impact. The Applicants 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.

6.3 PREFERRED ROUTE

The deciding factors in selectiong Morris Route 1 as the preferred route are as follows:

- Morris Route 1 is a rebuild of an existing transmission line for approximately 99.7 percent of its length. Although the Project proposes to permanently impact approximately 7 acres of land along the route, it is likely that fewer structures are required compared to existing conditions due to the span length proposed.
- Although the structures proposed for Morris Route 1 will be slightly taller than the existing structures, the route will not be a new visual feature. Though the route will potentially cause visual impacts to 16 homes along the route, the change in height will be minimally noticeable compared to the existing environment.
- In contrast, Morris Route 2 follows an existing transmission line corridor for only 29 percent of the route. Although an additional 62 percent of the route follows existing road corridors, a much larger percent of Morris Route 2 would present a new visual feature to area residents, compared to Morris Route 1. Visual impacts could be caused to 22 homes along the route.
- Morris Route 1 will have less agricultural impact. Route 1 will cause 7 acres in permanent impacts compared to Route 2's permanent impacts of 7.3 acres. Similarly, the Morris Route 1 will cause approximately 246 acres of temporary construction impacts compared to the Morris Route 2 temporary construction impacts of 257 acres. Since 99.7 percent of Morris Route 1 is along existing transmission corridors, compared to 29 percent of Morris Route 2, the impacts from Morris Route 1 are less likely to result in a change of land use and are consistent with the State's nonproliferation policy expressed by the Minnesota Supreme Court in [People for Environmental Enlightenment and Responsibility, Inc. (PEER) vs. Minnesota Environmental Quality Council, 266 N.W.2d 858, 868 (Minn. 1978) and confirmed in Minnesota Rules part 4400.3150, items H and J] of preferring existing ROWs to new ROW (See Section 5.3).

- The Applicants recognize that Morris Route 1 passes through environmentally sensitive areas, including WMAs, WPAs, and high priority areas for waterfowl habitat, that are areas of concern to the DNR and FWS. Although more easements in WPAs are required for Morris Route 1 compared to Morris Route 2, the fact that it is a rebuild of an existing transmission line for 99.7 percent of its length should limit the amount of impact to previously undisturbed habitat. The number of structures along the route will be less than existing conditions, due to increased span length, and the Applicants will replace the poles structure for structure, when feasible.
- In contrast, although Morris Route 2 would require less easements in state and federal lands, the transmission line would create a new impact, potentially creating conflicts with wildlife , native vegetation and agriculture.
- Although Morris Route 1 will cost slightly more than Morris Route 2 due to removal costs, the Applicants believe that the benefits of using existing transmission right of way outweigh the minimal additional costs of removing existing structures.
- The Applicants believe that Morris Route 1 also best addresses public concerns raised at public meetings, by utilizing existing right of way and minimizing impacts to landowners, businesses, population concentrations and agricultural resources.

TABLE 23
FACTORS CONSIDERED FOR THE MORRIS ROUTE

Factor	Morris Route 1	Morris Route 2	Lesser Impacts
Effects on human settlement and aesthetics			
Displacement	None	None	--
Noise	Noise levels will be within state standards and below background levels.	Same	--
Aesthetics	Structures and transmission lines will affect viewscape. However, 100 percent of the route follows existing transmission line corridors. Placement of the transmission line will potentially cause visual impacts to 16 homes along the route.	Structures and transmission line will affect viewscape. However, 91 percent of the route follows existing disturbed (transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 22 homes along the route.	Route 1
Cultural Values	None	None	--

Factor	Morris Route 1	Morris Route 2	Lesser Impacts
Recreation	There would be minimal visual impact to Big Stone NWR and the 7 WMAs and 10 WPAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	There would be minimal visual impact to Big Stone NWR and the 5 WMAs and 8 WPAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	--
Public Services	None	None	--
Socioeconomic	Minor positive short-term effects from construction activities to local economy expected.	Minor positive short-term effects from construction activities to local economy expected.	--
Effects on public health and safety	None	None	--
Effects on land-based economies	Pole placement will impact farmland throughout the corridor. Temporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 246 acres of agricultural land. Permanent impacts are estimated at 7.0 acres	Pole placement will impact farmland throughout the corridor. Temporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 257 acres of agricultural land. Permanent impacts are estimated at 7.3 acres	Route 1
Effects on archaeological and historic resources	Direct impacts to cultural resources will be avoided whenever possible. There is one archeaological site within 500' and 137 structures within 1 mile of alignment	Direct impacts to cultural resources will be avoided whenever possible. There is one archeaological site within 500' and 137 structures within 1 mile of alignment	--
Effects on the natural environment			
Air	There will be no measurable impacts relative to ozone. Temporary air quality impacts will be caused by construction-related emissions.	Same	--
Water	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands probable in Segments M-1, M-5 and M-17. One structure in each of three wetlands would cause 3,000 ft^2 of permanent impacts.	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands probable in Segment M-1. One structure in one wetland would cause 1,000 ft^2 of permanent impacts.	Route 2

Factor	Morris Route 1	Morris Route 2	Lesser Impacts
Flora/Fauna	Nominal impacts are expected to flora given that the entire route follows an existing transmission line route. Impacts to fauna are possible due to transmission line collision. The route passes through high priority areas identified by the FWS/DNR joint assessment. There will be structures placed in Twin Lakes WPA (along existing corridor). 17.6 ac of easements will be required in Twin Lakes WPA; 4.3 acres of easements required in Schulz WPA, and 7.3 acres of easements required in FWS habitat easements.	Nominal impacts are expected to flora given that the majority of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collision. The route passes through high priority areas identified by the FWS/DNR joint assessment. 0.2 ac of easements will be required in Twin Lakes WPA; 1.2 acres of easements required in Dismal Swamp WPA, 0.2 acres of easements in Reisdorph WMA, and 0.3 acres of easements required in Thomson WMA.	--
Effects on rare and unique natural resources	Two mesic prairie communities (identified by MCBS) may be directly impacted in Segments M-2 and M-3	Two mesic prairie communities (identified by MCBS) may be directly impacted in Segments M-2 and M-4	--
Application of design option that maximize energy efficiencies, mitigate adverse environmental effects and could accommodate expansion of transmission capacity	Applicants will work with the affected landowners to use a design that mitigates the impact on the affected landowners and the ROW. Expansion potential exists. However, there are no known or likely plans to add additional transmission capacity along the proposed route. Therefore, the design is appropriate to this Project and maximizes energy efficiency.	Same	--
Use or paralleling of existing ROWs, survey lines, natural division lines and agricultural field boundaries	Route follows existing transmission line corridor	Route designed to follow existing transmission line corridor for part of the route, and road rights of way and field boundaries for the majority of the route.	Route 1
Use of existing large electric power generating plant site	N/A	N/A	--
Use of existing transportation, pipeline and electrical transmission systems or ROWs	Route will follow existing transmission line right of way for entire length	Route will follow existing transmission line and/or roadway right of way for 91 percent of length	Route 1
Electrical system reliability	Line and route designed to provide reliable outlet capability	Same	--

Factor	Morris Route 1	Morris Route 2	Lesser Impacts
Costs of constructing, operating and maintaining the facility which are dependent on design and route	Construction costs estimated between $15,879,992 and $17,005,662 (cost is higher due to added removal costs)	Construction costs estimated between $14,049,659 and $15,231,304	Route 2
Adverse human and natural environmental effects which cannot be avoided	Unavoidable adverse impacts include the physical impacts to the land (primarily agricultural land) associated with the Project. The Applicants will implement measures as described in the environmental analysis and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects. These effects are similar for both routes proposed.		
Irreversible and irretrievable commitments of resources	Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but include those resources primarily related to construction. Construction resources that will be used include aggregate resources, concrete, steel and hydrocarbon fuel. These resources will be utilized to construct the Project. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels. These commitments of resources are similar for both routes proposed.		

7.0 WILLMAR CORRIDOR: ENVIRONMENTAL INFORMATION

7.1 ROUTE 1

7.1.1 DESCRIPTION OF ENVIRONMENTAL SETTING

Willmar Route 1 lies within the Prairie Grassland region of Minnesota. According to the DNR, Willmar Route 1 lies within the Minnesota River Prairie subsection of the Prairie Parkland Province under the ECS. The Minnesota River Prairie is a landscape dominated by large till plains on either side of the Minnesota River and is characterized by gently rolling terrain, except where split by the broad Minnesota River Valley. Elevations along Willmar Route 1 range from approximately 940 to 1,270 feet amsl.

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

The majority of Willmar Route 1 crosses cropland used to grow corn and soybeans. Communities near the route alignment are generally small farm-based towns. The primary exception is Willmar, a level 2 regional trade center located at the eastern end of the route alignment. A few WMAs are present near the route alignment, along with several wetlands. Relatively few forested areas are present, especially in the western and central sections of the route alignment. Most wooded areas are adjacent to farmsteads, or surround the lakes near Willmar.

7.1.2 HUMAN SETTLEMENT

7.1.2.1 Public Health and Safety

See Section 6.1.2.1 for a general discussion of public health and safety along Willmar Route 1.

One issue associated with HVTLs is the proximity of those transmission lines to airport facilities. Three airports are located within the vicinity of Willmar Route 1. The Willmar Municipal Airport is located near the Segment W-16 alignment of Willmar Route 1. The outer safety zone of this airport crosses into Section B4 of the corridor studied but does not cross the Segment W-16 alignment. The Appleton Airport is located south of the Segment W-3 alignment of Willmar Route 1; the route alignment is outside of the buffer zone and there are no ordinances applicable to the proposed transmission line.

7.1.2.2 Commercial, Industrial and Residential Land Use

Zoning information was obtained for the counties and cities along Willmar Route 1 (Appendix I) which includes Kandiyohi, Swift, Chippewa, and Big Stone counties. There are seven communities within one mile of the route alignment: Willmar, Kerkhoven, Murdock, DeGraff, Danvers, Odessa and Ortonville.

Table 24 shows that over 97 percent of the land in Willmar Route 1 is agricultural. Segments W-2, W-3, W-5, W-6, W-9, W-12, W-15, and W-16 encompass the majority of the agricultural land along Route 1 due to their location and length. Appendix I.1 defines the land use types identified in Table 24. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 24
GAP LAND USE DATA FOR WILLMAR ROUTE 1

Land Use Type	TOTAL	
	Area (acres)	Percent of Route
Agriculture	19542.94	97.27
Wetland/Riparian/Open Water	255.66	1.27
Forest	185.73	0.92
Shrubland	106.30	0.53
Prairie	0.0	0.00
Developed	0.60	<0.01
Total	20091.23	100

Big Stone County

The majority of land crossed by the route alignment in Big Stone County is zoned agricultural (A-1 and A-2). As noted in Section 6.1.2.2, transmission lines are permitted or conditional uses in these zoning districts in the county. There are a number of open space districts that are managed to protect unique ecological resources, fish and wildlife habitat, and recreational resources located to the south of the route alignment.

No schools, daycare facilities, churches, cemeteries, or airports were identified within the Big Stone portion of Willmar Route 1.

Kandiyohi County

The majority of the route alignment crosses districts zoned as Agricultural: Restricted Agriculture and General Agriculture (A-2). A portion of the route alignment also crosses an area zoned as Shoreline Management (R-1). According to the county zoning ordinance, transmission lines would be a conditional use in these zoning districts (Appendix I.4)

No schools, daycare facilities, churches or cemeteries were identified along the route alignment.. The Willmar Airport is located approximately three miles north of the route alignment, and would not be impacted.

Swift County

The majority of the route alignment crosses districts zoned as agriculture. There are some relatively short crossings of shoreland management zones associated with lakes and streams. The county ordinance does not state whether transmission lines would be a permitted or a conditional use (Appendix I.5)

No schools, daycare facilities, churches or cemeteries were identified along the route alignment; one cemetery was several hundred feet north of the route alignment near DeGraff (Saint Bridget Cemetery). The route alignment bypasses the Murdock Airport; no impacts are anticipated.

Chippewa County

A small portion of the route alignment crosses into agricultural land in Chippewa County. No schools, daycare facilities, churches or cemeteries were identified along the route alignment.

7.1.2.3 Displacement

There is one home in Willmar Route 1 that is located within 100 feet of the route alignment. There are 25 homes along Willmar Route 1 that are within 300 feet, but greater than 100 feet, from the proposed transmission line. See Appendix O for a breakdown of the number of homes along the route alignment.

7.1.2.4 Noise

See Section 6.1.2.4 for a general discussion of noise along Willmar Route 1.

7.1.2.5 Aesthetics

See Section 6.1.2.5 for a detailed discussion of the concepts of visual sensitivity and aesthetic impacts.

Willmar Route 1 follows existing roadway ROWs, section lines and half-section lines in a landscape that is dominated primarily by agriculture. The western portion of Willmar Route 1 is relatively near the Big Stone National Wildlife Refuge, Ortonville and U.S. Highway 75; each of which would be considered medium to high visual sensitivity areas. The central portion of Willmar Route 1 follows U.S. Highway 12 to a point roughly three miles west of Danvers. The eastern portion of the route follows county and local road ROWs, as well as half-section lines, to the Willmar Substation roughly one half mile south of Willmar. The easternmost 10 miles of the route follows the alignment of an existing 69 kV transmission line. Most of these portions of the route alignment would be considered low sensitivity visual resources, except where residences are present within 500 feet of the alignment. Review of field data and aerial photography indicates that 57 residences are located within 500 feet of the Willmar Route 1 alignment.

There are seven communities within one mile of the route alignment, incluing Willmar, Kerkhoven, Murdock, DeGraff, Danvers, Odessa and Ortonville. The degree to which the structures are visible will vary from town to town and depends on the proximity of the transmission line to each town, as well as elevation. The highest elevations are at the eastern end of the route in the Alexandria Moraine near Willmar. The proposed transmission line route is south of Willmar, east and north of Kerkhoven, east and north of Murdock, south and west of DeGraff, south of Danvers and south of Ortonville. Residents on those edges of the respective towns would likely be able to see the transmission line; the transmission line would not be visible from downtown Willmar or downtown Ortonville.

Error! Reference source not found. in Appendix J is representative of the general visual setting of Willmar Routes 1 and 2.

Similar to Morris Routes 1 and 2, the proposed transmission line structures would be wood H-frames between 70 and 100 feet high.

7.1.2.6 Socioeconomic

Willmar Route 1 is located in Kandiyohi, Swift, Chippewa and Big Stone counties. Table 25 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the Project area, the block groups are significantly larger than the actual area encompassed by Willmar Route 1.

As can be seen in Table 25, Block Group 2 of Census Tract 9604 has a significantly higher percentage of minorities and a lower per capita income than Swift County as a whole and any other block group along Willmar Route 1. The increased minority population and decreased per capita income is due to the presence of the Prairie Correctional Facility in Appleton, Minnesota, which at the time of the 2000 Census housed 1,314 males. Ten females are also listed as residing in a correctional institution. The correctional institution residents account for the low per capita income for the block group. Willmar Route 1 crosses this block group through a rural area, while the vast majority of the population (76 percent) lives in the urban community of Appleton. As a result, Willmar Route 1 would not have a disproportionately high impact on minority populations or low-income populations in Block Group 2 of Census Tract 9604. The rest of the block groups that Willmar Route 1 crosses do not contain populations of disproportionately high minority populations or low-income populations.

TABLE 25
WILLMAR ROUTE 1 POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Total Minority Population	Minority Population Percentage	Per Capita Income	Percent of Population Below Poverty Level
Minnesota	4,919,749	521,494	10.6	$23,198	7.9
Kandiyohi County	15,973	576	3.6	$19,627	9.7
Block Group 2, Census Tract 9806	1,219	72	5.9	$17,913	7.4
Block Group 3, Census Tract 9806	1,151	35	3.0	$18,104	5.9
Swift County	4,368	1,228	28.1	$16,360	10.4
Block Group 1, Census Tract 9601	855	3	0.4	$18,785	9.3
Block Group 2, Census Tract 9601	907	39	4.2	$16,550	8.2
Block Group 1 Census Tract 9603	720	2	0.3	$21,579	4.9
Block Group 2, Census Tract 9603	701	10	1.4	$16,228	4.9
Block Group 3, Census Tract 9603	576	6	1.0	$17,431	8.3
Block Group 1, Census Tract 9604	529	16	3.0	$16,671	11.8
Block Group 2, Census Tract 9604	1,852	975	52.6	$10,726	7.0
Chippewa County	5,363	538	10.0	$18,039	8.8
Block Group 1, Census Tract 9505	587	22	3.7	$28,165	6.8
Big Stone County	2,407	101	4.2	$15,708	10.7
Block Group 3, Census Tract 9501	546	3	0.5	$15,399	11.4

Table 26 identifies the top three leading industries in each county within the vicinity of the route.

TABLE 26
LEADING COUNTY INDUSTRIES

Geographic Area	Industry	Percent of Workforce
Kandiyohi County	Educational, health and social services	25.0
	Manufacturing	14.5
	Retail trade	12.7
Swift County	Educational, health and social services	18.7
	Manufacturing	16.9
	Retail trade	13.7
Chippewa County	Educational, health and social services	21.7
	Manufacturing	18.3
	Retail trade	11.4
Big Stone County	Educational, health and social services	27.1
	Agriculture, forestry, fishing, hunting and mining	13.4
	Retail trade	9.6

7.1.2.7 Cultural Values

Cultural values are defined in Section 6.1.2.7 above. The communities in the vicinity of Willmar Route 1 include Ortonville, Odessa, Benson, De Graff, Murdock, Kerkhoven and Pennock have cultural values based in pioneer roots and a history of life on prairies, lakes and rivers. The regional commercial and service centers of Ortonville and Willmar anchor the routes and have been historically and are currently supported by rural agricultural activities and light industry. Ortonville has been a regional commercial and light industrial hub since the 1880s and Willmar grew out of the placement of the railroad through the region in the 1870s. The other communities are also whistle stops on the route of predecessors of the current BNSF Railway. These stops were important centers for collecting produce and livestock and transporting them to markets such as St. Could and Minneapolis. Important crops along the route include corn, soybeans and alfalfa. Communities such as Benson also supported agricultural-related light industries, including grist (roller) mills and woolen mills, as well as brick production. During the 20th century other industries were added to the mix, including the production of agricultural implements and ethanol-based fuels. Willmar is one of Out-State-Minnesota's fastest growing communities primarily because of this diverse economic base.

The residents along Willmar Route 1 appear to value that diverse, rural economy and the opportunity it continues to bring to the region.

Lakes and rivers along the Willmar Route 1 offer residents and visitors recreational activities including fishing, boating, and snowmobiling. Resorts, parks and campgrounds on area lakes such as Big Stone Lake, Foot Lake, and Willmar Lake, have led to a burgeoning natural resources tourist trade; Willmar call itself the place "Where the Lakes Begin." In addition to the natural environment, the communities along Willmar Route 1 also appear to value the historic built environment. Notable features of each community are the historic structures that make up the "downtown cores" of each. These structures are prominent in tourist and economic development literature for the Big Stone, Swift, and Kandiyohi counties.

7.1.2.8 Recreation

There are a variety of outdoor recreational opportunities in the Project area, including snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting and nature observation. Appendix K.3 shows the locations of WMAs within the vicinity of the route. The detailed route maps in Appendix G identify the WMAs in more detail. The Big Stone National Wildlife Refuge is within one mile of the route alignment. There is one WMA (Claire Rollings), located within the route. Jossart WMA is within one mile of the route alignment. There is one FWS WPA (Persen WPA) located within the route. Within one mile of the route alignment, there are six additional WPAs, including Menzel, Hillman, Westhausen, Rambow, Priam and Raymond. The route alignment crosses five snowmobile trails: one each in the Segment W-2, W-6 and W-9 alignments and two in the Segment W-3 alignment. The Minnesota River Valley Birding Trail Prairie Waters Regional Loop crosses the route alignment on U.S. Highway 25 in Big Stone County; the Kandiyohi Lakes Regional Loop is along U.S. Highway 71 in Willmar, within 0.5 miles of the eastern terminus of the route alignment (Audubon Minnesota 2005). The route alignment also crosses U.S. Highway 75 near Ortonville. The route alignment crosses the Chippewa and Pomme de Terre rivers, which offer canoeing opportunities as well as sites for viewing wildlife.

7.1.2.9 Public Services

Willmar Route 1 includes Kandiyohi, Swift, Chippewa and Big Stone counties. There are seven communities within one mile of the route alignment: Willmar, Kerkhoven, Murdock, DeGraff, Danvers, Odessa and Ortonville. This is a rural area; Willmar and Ortonville are the only communities with typical public services such as electricity, natural gas, water (wells), wastewater treatment (some septic), cable television and telephone. For a discussion of potential airport conflicts see Section 6.1.2.2.

7.1.2.10 Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during the construction and operation of the facility. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the pole locations), impacts will be minimal and no mitigation is anticipated.

Displacement

The Applicants will work with landowners to make alignment adjustments to avoid any displacements.

Noise

See Section 6.1.2.10 for potential impacts and mitigation related to noise along Willmar Route 1.

Aesthetics

See Section 6.1.2.10 for potential impacts and mitigation related to aesthetics along Willmar Route 1.

Socioeconomic

See Section 6.1.2.10 for potential impacts and mitigation measures related to socioeconomics along Willmar Route 1. Permanent impacts to agricultural land is estimated at 13.6 acres.

It is anticipated that the majority of workers needed for this Project, other than earth movers, will be supplied from Otter Tail's substation construction workforce for the Big Stone 230 kV Substation, Big Stone 345 kV Substation and the Willmar Substation. Lineman positions that cannot be filled by the Applicants will be contracted out. No permanent net change in workforce is projected.

Cultural Values

See Section 6.1.2.10 for potential impacts and mitigation measures related to cultural values along Willmar Route 1.

Recreation

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants intend to and will work diligently to avoid any direct impacts to the WPAs within the route. The Applicants will likewise attempt to avoid placing structures in Jossart WMA. Claire Rollings WMA is divided into two parcels on either side of County Road 14. The route alignment is proposed along the southern side of this road, which is adjacent to the smaller parcel; however, because the proposed transmission line crosses through the WMA for a distance of approximately 1,300 feet; it is likely that a structure will be placed within that resource. The number of structures within the WMA will be minimized by maximizing the span length or replacing structure for structure. The route alignment is proposed to run along the northern edge of the WMA along an existing roadway and will not bisect the habitat. However, an easement will still be required due to the proximity of the route alignment to the WMA. The Applicants estimate that the easement will be approximately 3.8 acres.

The transmission line will likely be visible from the northern edge of the Big Stone National Wildlife Refuge, the WMAs and WPAs within one mile, the snowmobile trails and the Minnesota River Valley Birding Trails. The route will not interfere with the use of those recreational resources.

Public Services

No impact is expected to public services along Willmar Route 1.

7.1.3 LAND-BASED ECONOMICS

7.1.3.1 Agriculture

Along Willmar Route 1, approximately 97 percent of the land is used for agriculture (USGS 2004), and approximately 95 percent of the soils are listed by the NRCS as prime farmland, prime when drained or farmland of statewide importance (USDA NRCS 2005).

Section 6.1.3.1 discusses the agricultural resources of Big Stone County.

Swift County had the number of farms increase by 4 percent and total land in farms increase by 2 percent from 1997 to 2002. The average size of farms decreased by 3 percent to 515 acres. Crop sales in 2002 for Swift County were $87,385,000 (55 percent of agricultural products sold in the county) and livestock sales were $70,333,000 (45 percent). Crops in Swift County are primarily corn and soybeans. Swift County was the number two turkey producer in the State in 2002 (USDA 2002).

The number of farms increased in Kandiyohi County by 5 percent and the land in farms increased by 3 percent. The average size of farms decreased 2 percent to 317 acres. Crop sales in 2002 for Kandiyohi County were $83,050,000 (36 percent of agricultural products sold in the county) and livestock sales were $147,845,000 (64 percent). Kandiyohi County was the number one ranked county for poultry production (chickens and turkeys) in Minnesota in 2002 (USDA 2002).

According to the 2002 Census of Agriculture, Chippewa County has had the average farm size decrease by 5 percent and the total land in farms increase by 7 percent between 1997 and 2002. The number of full-time farms has increased by 76 farms during that time period. Crop sales in 2002 for Chippewa County were $87,784,000 (85 percent of agricultural products sold) and livestock sales were $15,097,000 (15 percent). Crops in Chippewa County are primarily corn and soybeans (USDA 2002).

The route alignment intersects with 10 center pivot irrigation systems: two in the Segment W-3 alignment, one in the Segment W-5B alignment, two in the Segment W-6 alignment and five in the Segment W-7 alignment.

7.1.3.2 Forestry

Willmar Route 1 occurs in what was historically the Prairie Grassland region of Minnesota. The primary tree cover in the Project area is associated with waterways and homesteads. No economically important forestry resources are within the Project area.

7.1.3.3 Tourism

See Section 6.1.3.3 for tourism opportunities at Big Stone Lake and the Big Stone County Historical Museum.

U.S. Highway 75 runs through Ortonville and crosses the route alignment. The Minnesota River Valley Birding Trail Prairie Waters Regional Loop crosses the route alignment on U.S. Highway 25 in Big Stone County; the Kandiyohi Lakes Regional Loop is along U.S. Highway 71 in Willmar. The route alignment crosses the Chippewa and Pomme de Terre rivers, which offer canoeing opportunities as well as sites for viewing wildlife. The DNR Glacial Lakes Trail includes hiking, biking, horseback riding, inline skating and snowmobiling uses and attracts visitors year-round. There is a trail that connects to the Glacial Lakes Trail within two miles of the eastern terminus of the route alignment.

7.1.3.4 Mining

Along Willmar Route 1, glacial drift is composed primarily of till with few areas of buried sand and gravel. The drift is approximately 50 to 100 feet deep in the western portion of Willmar Route 1, near the Minnesota River, and increases to a thickness of approximately 300 feet along most of the eastern portion of the route alignment.

Though Precambrian bedrock underlies the entire Project; Cretaceous shale and sandstone deposits are found at variable locations and thicknesses along Willmar Route 1. The thickness of the Cretaceous bedrock ranges from zero to 50 feet in the western portion of the route alignment to 100 feet along the eastern half in Swift and Kandiyohi counties.

On the western end of the route (near U.S. Highway 75) there is a cluster of aggregate sites. The sites include three abandoned gravel pits, five active private gravel pits, one Mn/DOT gravel pit, two commercial aggregate sites and a rock quarry. The rock quarry is located near the Minnesota River where there are Sioux Quartzite outcrops and only a thin covering of glacial overburden.

Several aggregate sites are clustered south of Willmar Route 1 around U.S. Highway 12 on the western side of Swift County. They include two abandoned gravel pits, two active private gravel pits and two Mn/DOT gravel pits.

7.1.3.5 Impacts and Mitigation: Land-Based Economies

Agriculture

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the route of the transmission line (Appendix L.2). The Applicants estimate permanent impacts to agricultural lands at approximately 13.6 acres for the route. Approximately 95.6 percent of the soils impacted would be prime farmland or farmland of statewide importance. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur.

The Applicants estimate that approximately 462 acres of agricultural land will be impacted temporarily by Willmar Route 1 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 16.0 acres.

The route crosses 10 center-pivot irrigation systems. The Applicants will work with landowners to minimize impacts to farming operations along the route alignment, such as by aligning the transmission line along section and field lines and avoiding center-pivot irrigated areas whenever possible. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Forestry

See Section 6.1.3.5 for potential impacts and mitigation measures related to forestry along Willmar Route 1. Impacts along the route to shelterbelts are estimated at 20.2 acres.

Tourism

No impacts to area tourism are anticipated from the presence of the transmission line and no mitigation is necessary.

Mining

Although a few sand and gravel pits and a quarry are near Willmar Route 1, no impacts to these resources are anticipated. No mitigation is necessary.

7.1.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Two previously-identified archaeological resources, an earthwork reported by Winchell (Site 21BS0008) and a pre-contact lithic scatter and possible cemetery (Site 21SW0013), are within 500 feet of Willmar Route 1 and are listed in Appendix L.1.

In addition, 167 previously-inventoried standing structures have been recorded within one mile of Willmar Route 1 (Appendix L.2). These standing structures include commercial and community buildings, houses, farmsteads, bridges and churches. Construction dates for inventoried structures range from the 1870s to the 1950s. Many of the structures are centered in cities or towns. Properties in Ortonville include the individually NRHP-listed Big Stone County Courthouse (BS-ORT-041), Columbia Hotel (BS-ORT-027) and Ortonville Free Library (BS-ORT-031). The 20 structures that comprise the NRHP-listed Ortonville Commercial Historic District are also within one mile of Willmar Route 1.

In addition to these properties in Ortonville, the 1-mile buffer contains 23 inventoried properties in Odessa, three in Danvers, eight in DeGraff, five in Murdock and 13 in Kerkhoven (all inventoried during 1980s countywide surveys) as well as other rural properties in the counties (Appendix L.2). There are three structures listed on the NRHP, namely: the Odessa Jail (BS-ODE-018), the Church of St. Bridget (SW-DEG-001) in DeGraff and the Sabin S. Murdock House (SW-MUR-001) in Murdock. One additional inventoried structure in Murdock, a Hotel (SW-MUR-005), has been determined eligible for listing on the NRHP. In addition the U.S. Highway 12 State Line Marker (BS-OTN-005) and the County Road 79 bridge over the Minnesota River (BD-ORT-059) are eligible for listing on the NRHP.

The 1850s to 1870s PLS, prepared during the late 19^{th}-century government surveys, show multiple archaeological and historic features in the route vicinity, particularly in areas adjacent to Big Stone Lake and the Minnesota River. Features are represented in Akron Township in Big Stone County and multiple archaeological and historic features are shown in the townships of Swift and Chippewa counties. These historic features include railroad segments, several unnamed trails/roads and multiple farms/structures.

7.1.4.1 Impacts and Mitigation: Archaeological and Historic Resources

See Section 6.1.4.1 for potential impacts and mitigation related to archaeological and historic resources along Willmar Route 1.

7.1.5 NATURAL ENVIRONMENT

7.1.5.1 Air Quality

See Section 6.1.5.1 for a general discussion of air quality along Willmar Route 1.

7.1.5.2 Water Quality

Willmar Route 1 lies within the Minnesota River (Headwaters), Chippewa River and Pomme de Terre River watersheds of the Minnesota River Basin (MPCA 2005). Surface water flows generally south and west toward the Minnesota River along the route alignment. Surface water resources along the route alignment include the Pomme de Terre and Chippewa rivers and associated tributaries, county ditches and scattered lakes.

Individual Public Waters (stream and ditch crossings) are listed in Table 27.

TABLE 27
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-W	Minnesota River
W-2	Stony Run
W-3	Pomme de Terre River Unnamed Tributary to Minnesota River Five Mile Creek
W-7	Chippewa River
W-12A	Shakopee Creek Unnamed Stream (T 119N R 37W, Section 26)
W-15	Hawk Creek

Source: DNR 2004. Public Water Inventory Maps

The route alignment will cross 23 wetlands identified by the NWI, 13 of which are palustrine emergent type (FWS 2005, NWI). One of the wetlands is listed as a Public Water. Additionally, the route alignment is within 100 feet of a PWI wetland along the Segment W-3 alignment and within 700 feet of a PWI wetland along the Segment W-12A alignment. Many of these wetlands are hydrologically-connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the WCA. The number and type of NWI wetlands crossed by the route alignment are shown in Table 28. Both the PWI and NWI information related to the route are identified on the maps in Appendix K.

TABLE 28
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland	Number of Public Water Crossings
G-W	2 palustrine emergent, 1 palustrine forested	0 crossings
W-2	1 palustrine emergent	0 crossings
W-3	3 palustrine emergent, 1 palustrine forested, 1 riverine	0 crossings
W-5A	No wetlands	0 crossings
W-5B	No wetlands	0 crossings
W-6	1 palustrine emergent, 1 palustrine forested	0 crossings
W-7	1 palustrine emergent, 2 palustrine forested, 1 riverine	0 crossings
W-9	1 palustrine emergent, 2 palustrine scrub/shrub	0 crossings
W-12A	1 palustrine emergent	0 crossings
W-12B	1 palustrine emergent, 1 palustrine scrub/shrub	1 crossing
W-15	1 palustrine emergent	0 crossings
W-16	1 palustrine emergent	0 crossings

The MPCA lists five impaired waters along Willmar Route 1. MPCA data along the route is summarized in Table 29.

TABLE 29
MPCA IMPAIRED WATERS BY SEGMENT

Segment	Waterbody Name	Reason for Impairment
G-W	Minnesota River	Mercury and fecal coliform
W-2	Stony Run	Biota
W-3	Pomme de Terre River	Fecal coliform, low oxygen and turbidity
W-6	Judicial Ditch #8	Biota
W-7	Chippewa River	Mercury and fecal coliform

Source: MPCA 2004. Minnesota's Imparied Water and Total Maximum Daily Loads

7.1.5.3 Flora

The route is primarily located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation found in remnant prairie communities within this ecoregion. The eastern portion of Swift County and southwestern portion of Kandiyohi County are in the Western Corn Belt Plains Ecoregion. Tallgrass prairie remnants found within this region include big and little bluestem, indiangrass *(Sorghastrum mitaus)* and green needlegrass. On steeper slopes, needle and thread *(Hesperostirpa comata)* and prairie dropseed *(Sporobolus heterolepis)*, along with deciduous woodland, can be found (Aaseng 1993).

As a result of settlement and farming in the 1800s, much of the route vicinity has been converted to agriculture. The dominant plant species in the agriculture areas are corn, soybeans and wheat; in the grazed areas, dominant vegetation would include grasses such as smooth brome and sorghum.

The USGS GAP land cover types along the route alignment are shown in Table 30. The GAP land cover data shows that approximately 97 percent of the land along the route is in agricultural uses. Appendix I.1 lists the specific GAP categories that are used for the general cover types shown below.

TABLE 30
GAP LAND COVER – WILLMAR ROUTE 1

Cover Type	Area (acres)	Percent of Route
Agriculture	19,543	97.3
Wetland/Riparian/Open Water	256	1.2
Forest	186	0.9
Shrubland	106	0.5
Prairie	0	0
Developed	0.06	>0.1

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data

Within the route, there are several areas where natural vegetation is being managed. Claire Rollings WMA contains grassland, cultivated and wetland vegetation. The grassland vegetation is likely made up of species found in idle pastureland and grassland, such as smooth brome, but could include remnants of native prairie species; the wetland vegetation likely has emergent, marsh plant species, such as sedges and cattails. Persen WPA is located within the route, containing wetland and grassland vegetation (DNR 2005). The route alignment does not cross the WMAs or WPAs.

Along the route alignment, there are approximately 2.5 acres of FWS habitat easements and 292 acres of wetland easements.

Within the route, there are 14 native plant communities listed by the DNR: two dry hill prairie communities, one wet prairie community and five rock outcrop communities along the Segment W-2 alignment, two dry hill prairie communities, one mesic prairie community and one wet prairie community along the Segment W-3 alignment, one mesic prairie community along the Segment W-9 alignment and one mesic prairie community along the Segment W-12A alignment. Within one mile of the route alignment, there are 28 additional natural communities listed by the DNR (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Appendix M.1 lists the plants found within these plant communities. DNR data describing railroad prairies was also analyzed for the route. Results of the analysis are given in Section 7.1.6.

7.1.5.4 Fauna

Although 97 percent of the land adjacent to the route is cultivated, there are several WMAs and WPAs along Willmar Route 1 that provide habitat for a variety of animal species. The Big Stone National Wildlife Refuge is located along the Minnesota River within one mile of the western end of the route alignment. Section 6.1.5.4 lists the wildlife that can be found in these habitats.

Most of the route is adjacent to cultivated land, which provides some cover for the common fauna known to inhabit Minnesota. A discussion of common wildlife and avian resources is given in Section 6.1.5.4, and a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

The high priority areas shown in the FWS and DNR joint assessment are identified in Appendix K.5 and are generally limited to the western end of Willmar Route 1. Specifically, the Segment G-W, W-2 and W-3 alignments cross high priority areas for grassland and wetland habitat (FWS and DNR 2005). See Section 6.1.5.4 for a discussion of the joint assessment.

There is one colonial waterbird rookery within one mile of the Segment W-2 alignment in the Big Stone National Wildlife Refuge. Green heron inhabit this rookery (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Because of the high density of birds in such rookeries, any disturbance to the site has the potential to impact the reproductive success of large portions of a species' population. There are also two documented freshwater mussel concentration sites within one mile of the Segment W-2 alignment within the Big Stone National Wildlife Refuge.

7.1.5.5 Impacts and Mitigation: Natural Environment

Air Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to air quality along Willmar Route 1.

Water Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to water quality along Willmar Route 1. For Willmar Route 1, permanent impacts to the PWI wetland crossed by the Segment W-12B alignment are possible since the basin is nearly 1,000 feet wide, paralleling the existing 69 kV transmission line. It is anticipated that a maximum of one structure may be placed in this wetland, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact and approximately 20,000 square feet of temporary impact; however, the Applicants will attempt to shift the route to avoid placing any structures in the wetland, if possible. The Applicants will obtain utility crossing permits from the DNR for any PWI water crossed.

Flora

As stated in Section 6.1.5.5, native vegetation is anticipated to be minimal and impacts to WPAs and Federally-funded WMAs may require a compatibility analysis.

The Applicants estimate that a 3.8-acre easement within Federally-funded Claire Rollings WMA will be needed. No easements within FWS easements or WPAs are anticipated.

The Applicants will avoid impacting the DNR-listed natural communities within the route. It is possible that the surveyed remnant wet prairie community along the Segment W-2 alignment could be impacted, since the route alignment crosses it for a distance greater than 1,000 feet.

Fauna

As stated in Section 6.1.5.5, there is minimal potential for the displacement of wildlife and loss of habitat from construction of Willmar Route 1.

Similar to Morris Route 1, avian collisions are a possibility after construction. Along Willmar Route 1, the Segment G-W, W-2 and W-3 alignments pass 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 Applicants will work with the FWS and DNR to minimize impacts along these segments as necessary.

See Section 6.1.5.5 for potential impacts and mitigation measures related to fauna along Willmar Route 1.

7.1.6 RARE AND UNIQUE NATURAL RESOURCES

Table 31 lists the rare or unique resources identified within one mile of Willmar Route 1. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Willmar Route 1 are associated with remnants of prairie land.

TABLE 31
RARE AND UNIQUE RESOURCES

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Mucket Mussel	1	*Actinonaias ligamentina*	Not Listed	THR	S2	Medium to large rivers in sand and gravel
Carolina Foxtail	5	*Alopecurus carolinianus*	Not Listed	NON	NR	Wet meadows, wet prairies
Slender Milk-vetch	2	*Astragalus flexuosus*	Not Listed	SPC	S3	Mesic and dry mesic prairies
Low Milk-vetch	1	*Astragalus lotiflorus*	Not Listed	NON	NR	Tallgrass prairie
A Species of Lichen	2	*Buellia nigra*	Not Listed	END	S1	Exposed rocks near hardwood forests
Larger Water-starwort	2	*Callitriche heterophylla*	Not Listed	SPC	S3	Shallow water or mud of springs and stream pools
Colonial Waterbird Nesting Site	1	Colonial Waterbird Nesting Area	Not Listed	None	NR	
Small White Lady's-slipper	5	*Cypripedium candidum*	Not Listed	SPC	S3	Wet to wet-mesic prairies and calcareous fens
Three Stamened Waterwort	2	*Elatine triandra*	Not Listed	NON	NR	Mud flats or floating in shallow waters of lakes and ponds
Few-flowered Spike-rush	1	*Eleocharis quinqueflora*	Not Listed	SPC	S3	Calcareous fens
Ball Cactus	12	*Escobaria vivipara*	Not Listed	END	S1	Rock outcrops
Mussel Sampling Site	2	Freshwater Mussel Concentration Area	Not Listed	None	NR	
Little Barley	1	*Hordeum pusillum*	Not Listed	NON	NR	Stream banks, pond margins
Loggerhead Shrike	1	*Lanius ludovicianus*	Not Listed	THR	S2	Open country and dry upland prairie where hedgerows, shrubs and small trees occur
Creek Heelsplitter	1	*Lasmigona compressa*	Not Listed	SPC	S3	Small to medium river in sand and fine gravel
Mudwort	4	*Limosella aquatica*	Not Listed	SPC	S3	Steram banks, shallow margins of prairie ponds and rock pools
Forget-me-not	5	*Myosotis verna*	Not Listed	NON	NR	Clearings in dry woods
Mousetail	6	*Myosurus minimus*	Not Listed	NON	S4	Shallow still or slowly flowing waters. Muddy or sandy shorelines and areas with fluctuating water levels

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Powesheik Skipper	1	*Oarisma powesheik*	Not Listed	SPC	S3	Wet mesic prairie with native grasses, sedges and a significant number of plants in the sunflower family
Hair-like Beak-rush	1	*Rhynchospora capillacea*	Not Listed	THR	S2	Calcareous fens and bogs
Regal Fritillary	2	*Speyeria idalia*	Not Listed	SPC	S3	Large grassland areas or lightly grazed pasture lands with prairie remnants. Larval plants are violets.
Marsh Arrow-grass	2	*Triglochin palustris*	Not Listed	NON	S4	Bogs and marshes
Dry Prairie, Southwest Hill Subtype	12		None	None	S2	
Mesic Prairie	19		None	None	S2	
Wet Prairie	4		None	None	S2	
Rock Outcrop	7		None	None	NR	

** 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.

Within the route, there are six MCBS areas with moderate biodiversity significance and seven areas with high biodiversity significance. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Willmar Route 1.

An initial survey conducted in June 2005 showed that the route alignment crosses four remnant prairie communities: one wet prairie community and rock outcrop community along the Segment W-2 alignment and two dry prairie communities along the Segment W-3 alignment (GES 2005). There are three DNR-listed railroad prairies along the route; a medium qulity wet mesic prairie along Segment W-9, a good quality wet mesic along Segment W-12 and a medium quality wet mesic prairie at the eastern edge of W-15.

7.1.6.1 Impacts and Mitigation: Rare and Unique Natural Resources

A search of the DNR's Minnesota Natural Heritage Database identified two State endangered species (the lichen (*Buellia nigra)* and ball cactus), three State threatened species (mucket mussel, loggerhead shrike (*Lanius ludovicianus*) and hair-like beak-rush) and eight species of special concern within one mile of the route alignment. Most of the occurrences identified by the Natural Heritage Database are within the DNR's WMAs along the route alignment. Forty-two DNR listed natural communities are within one mile of the route alignment.

It is possible that the surveyed remnant wet prairie community along the Segment W-2 alignment could be impacted, since the route alignment of the route alignment crosses it for a distance greater than 1,000 feet. Shelterbelts and hedgerows will be conserved as possible. These habitats are important to loggerhead shrikes. In the event shelterbelts and hedgerows for a known loggerhead shrike population must be affected, the Applicants will work with the DNR on appropriate mitigation.

The Applicants will attempt to avoid placing structures within MCBS areas of biodiversity significance. One area of high biodiversity significance along the Segment W-2 alignment is wider than 1,000 feet; it is therefore likely that a structure would be placed in this resource.

The Applicants will attempt to span any habitats where native prairie fragments or other unique plant communities have been recorded or could occur. A survey for special status species will be conducted once a route alignment is approved. Additionally, host plants for listed organisms (such as the Regal Fritillary) will be preserved and the area will be restored with the appropriate seed mix containing host plants, as applicable. No impacts to the DNR-listed railroad prairies are expected. In general, two prairie remnants occur. Railroad prairies, in general, occur on railroad ROW and

Mn/DOT ROW between roadways and railbeds, where the land has not been farmed or significantly disturbed. The route alignment will not be placed in railroad ROW, and structures will be placed just outside of Mn/DOT ROW. Therefore, no impacts to these prairie communities should result. The Applicants will continue to work with the DNR to avoid impacts to these resources.

The ball cactus and the lichen (*Buellia nigra)*, both State endangered species, occur in rock outcrops. The applicants should be able to avoid placing structures in rock outcrops along the route alignment. If construction within outcrops cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

The mucket mussel, a State threatened species, and other special status mussels occur in rivers, such as the Minnesota River and Pomme de Terre River. The Applicants will avoid impacting these species by spanning the rivers.

The hair-like beak-rush, a State threatened species, occurs in calcareous fens. Several of the listed special concern species 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 Applicants will attempt to span streams and wetlands along the route alignment whenever feasible. Whenever it is not feasible to span, a survey will be conducted to determine the presence of special status species and coordination will occur with the appropriate agencies to avoid and minimize any impact. The Applicants 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.

7.2 ROUTE 2

7.2.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The environmental setting for Willmar Route 2 is essentially the same as that for Willmar Route 1 (Section 7.1.1).

7.2.2 HUMAN SETTLEMENT

7.2.2.1 Public Health and Safety

See Section 6.1.2.1 for a general discussion of public health and safety along Willmar Route 2.

One issue associated with high-voltage transmission lines is the proximity of those lines to airport facilities. Two airports are located within the vicinity of Willmar Route 2. The Willmar Municipal Airport is located near segment W-16 of Willmar Route 2. The outer safety zone of this airport crosses into Section B4 of the corridor studied but does not cross segment W-16. The Benson Airport is located north of segment W-10 and the route is outside of any zones and there are no ordinances applicable to the proposed transmission line. The Benson Airport is located outside of any zones and there are no ordinances applicable to the proposed transmission line.

7.2.2.2 Commercial, Industrial and Residential Land Use

Zoning information was obtained for the counties and cities along Willmar Route 2 (Appendix I) which includes Kandiyohi, Swift, Chippewa and Big Stone counties. There are two communities within one mile of the route alignment: Willmar and Ortonville. Holloway is 1.5 miles from the route.

Table 32 shows that over 97 percent of the land in Willmar Route 2 is agricultural. Segments W-1A, W-14, W-17, W-21, W-22, W-23, and W-29 encompass the majority of the agricultural land. Appendix I.1 defines the land use types identified in Table 32. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 32
GAP LAND USE DATA FOR WILLMAR ROUTE 2

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agriculture	20,649.43	97.28
Wetland/Riparian/Open Water	279.46	1.30
Forest	169.77	0.80
Shrubland	83.18	0.39
Prairie	1.17	0.01
Developed	46.06	0.22
Total	21,226.08	100

Big Stone

General land use in Big Stone County; including schools, churches, cemeteries and airports is essentially the same along Willmar Route 2 as along Willmar Route 1.

Kandiyohi

General land use in Kandiyohi County; including schools, churches, cemeteries and airports is essentially the same along Willmar Route 2 as along Willmar Route 1.

Swift

General land use in Swift County; including schools, churches, cemeteries and airports is essentially the same along Willmar Route 2 as along Willmar Route 1, with the exception that the route alignment is further removed from developed areas including Danvers, DeGraff, Murdock, and Kerkoven.

Chippewa County

General land use in Chippewa County, including schools, churches, cemeteries and airports is essentially the same along Willmar Route 2 as along Willmar Route 1.

7.2.2.3 Displacement

There is one home on Willmar Route 2 that is located within 100 feet of the route alignment of the proposed transmission line. There are 16 homes along Willmar Route 2 that are within 300 feet but greater than 100 feet from the proposed transmission line.

7.2.2.4 Noise

See Section 6.1.2.4 for a general discussion of noise along Willmar Route 2.

7.2.2.5 Aesthetics

The potential aesthetic impacts from Willmar Route 2 are essentially the same as for Willmar Route 1. Exceptions include:

- Only two communities are within one mile of Willmar Route 2; Ortonville and Willmar.
- The route alignment runs north-south approximately five miles west of Danvers, then runs east-west roughly five miles south of Willmar Route 1.
- The route alignment follows approximately four miles of existing 69 kV transmission line west of Willmar.
- A total of 43 homes were identified within 500 feet of the route alignment.

There are two communities within one mile of the route alignment; Willmar and Ortonville. Holloway is one and one half miles from the route. However, the degree to which the structures are visible will vary from town to town and depends on the proximity of the transmission line to each town, as well as elevation.

7.2.2.6 Socioeconomic

Socioeconomic resources described in Section 7.1.2.6 apply to Willmar Route 2.

Willmar Route 2 is located in Kandiyohi, Swift, Chippewa, and Big Stone counties. Table 25 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Willmar Route 2.

7.2.2.7 Cultural Values

See Section 6.1.2.7 for a general discussion of cultural value resources along Willmar Route 2.

7.2.2.8 Recreation

There are a variety of outdoor recreational opportunities in Willmar Route 2, including snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting and nature observation. Appendix K.3 shows the locations of WMAs within the vicinity of the route. The detailed route maps in Appendix G identify the WMAs in more detail. There are two WMAs (Danvers and Sena) located along the route. Within one mile of the route alignment, there are three additional WMAs, including Claire Rollings, Cuka and Tjosaas. There are two FWS WPAs (Menzel and Hillman) located along the route. Within one mile of the route alignment, there are seven additional WPAs, including Redhead Marsh, Krogsrud, Person, Akron, Raymond, Rambow and Priam. The route crosses five snowmobile trails: three in segment W-1A, one in Segment W-20, and one in Segment W-22. The Minnesota River Valley Birding Trail Prairie Waters Regional Loop crosses the route on U.S. Highway 25 in Big Stone County; the Kandiyohi Lakes Regional Loop is along U.S. Highway 71 in Willmar, within 0.5 miles of the eastern terminus of the route alignment. The route also crosses U.S. Highway 75 near Ortonville. The route alignment crosses the Chippewa and Pomme de Terre Rivers, which offer canoeing opportunities as well as sites for viewing wildlife.

7.2.2.9 Public Services

Willmar Route 2 includes Kandiyohi, Swift, Chippewa, and Big Stone counties. There are two communities within one mile of the route alignment, Willmar and Ortonville. Both communities provide typical public services such as electricity, natural gas, water (wells), wastewater treatment (some septic), cable television and telephone. For a discussion of potential airport conflicts see Section 6.1.2.2.

7.2.2.10 Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during the construction and operation of the facility. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the pole locations), impacts will be minimal and no mitigation is anticipated.

Coordination with local government representatives and citizens may be necessary as the route is finalized to minimize or avoid impacts to sensitive land uses

Displacement

The Applicants will work with landowners to make alignment adjustments to avoid any displacements.

Noise

See Section 6.1.2.10 for potential impacts and mitigation measures related to noise for Willmar Route 2.

Aesthetics

See Section 6.1.2.10 for potential impacts and mitigation measures related to aesthetics for Willmar Route 2.

Socioeconomic

See Section 7.1.2.10 for potential impacts and mitigation measures related to socioeconomics for Willmar Route 2.

Cultural Values

See Section 6.1.2.10 for potential impacts and mitigation measures related to cultural values along Willmar Route 2.

Recreation

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants intend to and will work diligently to avoid any direct impacts to WMAs and WPAs within the route. However, an easement may still be required due to the proximity of the route alignment to the Hillman WPA. The Applicants estimate that the easement will be 1.0 acres.

The transmission line will likely be visible from the WMAs and WPAs within one mile; the Minnesota River Valley Birding Trail and U.S. Highway 75. The route will not interfere with the use of those recreational resources.

Public Services

No impact is expected to public services along Willmar Route 2.

7.2.3 LAND-BASED ECONOMICS

7.2.3.1 Agriculture

Along Willmar Route 2, approximately 97 percent of the land is used for agriculture (USGS 2004), and approximately 97 percent of the soils are listed by the NRCS as prime farmland, prime when drained or farmland of statewide importance (USDA NRCS 2005).

Section 6.1.3.1 describes the agricultural resources of Big Stone, Swift, Kandiyohi and Chippewa counties.

The route alignment crosses five center-pivot irrigation systems: one along the Segment W-20 alignment and four along the Segment W-21 alignment. The route alignment passes within 1,000 feet of a poultry production operation along the Segment W-14 alignment.

7.2.3.2 Forestry

Willmar Route 2 occurs in what was historically the Prairie Grassland region of Minnesota. The primary tree cover in the project area is associated with waterways and homesteads. No economically important forestry resources are within the Project area.

7.2.3.3 Tourism

See Section 6.1.3.3 for tourism activities at Big Stone Lake and Big Stone County Historical Museum.

The Minnesota River Valley Birding Trail Prairie Waters Regional Loop crosses the route on U.S. Highway 25 in Big Stone County; the Kandiyohi Lakes Regional Loop is along U.S. Highway 71 in Willmar. The route alignment crosses the Chippewa and Pomme de Terre Rivers, which offer canoeing opportunities as well as sites for viewing wildlife. The DNR Glacial Lakes Trail includes hiking, biking, horseback riding, inline skating and snowmobiling uses, and attracts visitors year-round. There is a trail that connects to the Glacial Lakes trail within two miles of the eastern terminus of the route alignment. U.S. Highway 75 runs through the Ortonville and crosses the route alignment.

7.2.3.4 Mining

Mining resources along Willmar Route 2 are similar to those along Willmar Route 1 as described in Section 7.1.3.4.

7.2.3.5 Impacts and Mitigation: Land-Based Economies

Agriculture

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the route alignment. The Applicants estimate permanent impacts to agricultural lands at approximately 15.2 acres for the route alignment. Approximately 97.5 percent of the soils impacted in agricultural lands would be prime farmland or farmland of statewide importance. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur.

The Applicants estimate that approximately 518 acres of agricultural land will be impacted temporarily by Willmar Route 2 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 18.0 acres.

The route crosses five center-pivot irrigation systems. The Applicants will work with landowners to minimize impacts to farming operations along the route alignment. By aligning the transmission line along section and field lines and avoiding center-pivot irrigated areas whenever possible, impacts can be minimized. Landowners commented at public meetings that they would prefer structures to be as close to field lines and roadways as possible. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Forestry

See Section 6.1.3.5 for potential impacts and mitigation measures related to forestry along Willmar Route 1. Impacts along the route to shelterbelts is estimated at 9.7 acres.

Tourism

No impacts to area tourism are anticipated from the presence of the line, and no mitigation is necessary.

Mining

Although a few sand and gravel pits and a quarry are near Willmar Route 2, no impacts to these resources are anticipated. No mitigation is necessary.

7.2.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

One previously-identified archaeological resource, an earthwork reported by Winchell (Site 21BS0008), is within 500 feet of the Willmar Corridor Route 2 and is listed in Appendix L.1.

In addition, 117 previously-inventoried standing structures have been recorded within one mile of the Willmar Corridor Route 2 (Appendix L.2). These standing structures include commercial and community buildings, houses, farmsteads, bridges and churches. Construction dates for inventoried structures range from the 1870s to the 1950s. Many of the structures are centered in cities or towns. Properties in Ortonville include the individually NRHP-listed Big Stone County Courthouse (BS-ORT-041), the Columbia Hotel (BS-ORT-027), and the Ortonville Free Library (BS-ORT-031). The 20 structures that comprise the NRHP-listed Ortonville Commercial Historic District are also within one mile of the Willmar Corridor Route 2. In addition the U.S. Highway 12 State Line Marker (BS-OTN-005) and the Co. Rd. 79 bridge over the Minnesota River (BD-ORT-059) are within the buffer and are eligible for listing on the NRHP.

The 1850s to 1870s PLS, prepared during the late 19th-century government surveys, show multiple archaeological and historic features along the corridor, particularly in areas adjacent to Big Stone Lake and the Minnesota River. Features are represented in Akron Township in Big Stone County, Minnesota, and multiple archaeological and historic features are shown in the other townships of Swift and Chippewa counties. These historic features include railroad segments, several unnamed trails/roads and multiple farms/structures.

7.2.4.1 Impacts and Mitigation: Archaeological and Historic Resources

See Section 6.1.4.1 for potential impacts and mitigation related to archaeological and historic resources along Willmar Route 2.

7.2.5 NATURAL ENVIRONMENT

7.2.5.1 Air Quality

See Section 6.1.5.1 for a general discussion of air quality along Willmar Route 2.

7.2.5.2 Water Quality

See Section 7.1.5.2 for a general discussion of watersheds and surface water resources along Willmar Route 2.

TABLE 33
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-W	Minnesota River
W-1A	Stony Run Unnamed Tributary to Minnesota River Five Mile Creek Pomme de Terre River
W-20	Unnamed Tributary to Cottonwood Creek
W-21	Unnamed Tributary to Cottonwood Creek Cottonwood Creek Unnamed Tributary to Chippewa River Chippewa River Unnamed Tributary to Shakopee Creek Unnamed Tributary to Shakopee Creek
W-22	Shakopee Creek (3 crossings)
W-23	Unnamed Tributary to Shakopee Creek Unnamed Tributary to Shakopee Creek
W-24	Unnamed Tributary to Shakopee Creek
W-29	Unnamed Stream
W-14	Hawk Creek
W-17	Chetomba Creek (2 crossings)

Source: DNR 2005. PWI Maps

The route alignment will cross 56 wetlands identified by the NWI, 40 of which are palustrine emergent type (FWS 2005, National Wetland Inventory). Seven of the wetlands are listed as Public Waters. Many of these wetlands are hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act. The number and type of NWI wetlands crossed by the route alignment are shown in Table 34. Both the PWI and NWI information related to the proposed route alignment is identified on the maps in Appendix K.

TABLE 34
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland	Number of Public Water Crossings
G-W	2 palustrine emergent, 1 palustrine forested	0 crossings
W-1A	24 palustrine emergent, 5 palustrine forested, 3 palustrine unconsolidated bottom	4 crossings (4 PWIs)
W-12B	1 palustrine emergent, 1 palustrine scrub/shrub	1 crossing
W-14	1 palustrine forested	0 crossings
W-17	3 palustrine emergent	0 crossings
W-18	No wetland crossings	0 crossings
W-19	2 palustrine emergent	1 crossing
W-20	1 palustrine emergent, 1 palustrine forested	0 crossings
W-21	2 palustrine emergent, 2 palustrine forested, 1 palustrine scrub/shrub	0 crossings
W-22	No wetland crossings	0 crossings
W-23	1 palustrine emergent	0 crossings
W-24	1 palustrine emergent	0 crossings
W-29	3 palustrine emergent, 1 palustrine scrub shrub	1 crossing

The MPCA lists five impaired waters along Willmar Route 2. MPCA data along the route is summarized in Table 35.

TABLE 35
MPCA IMPAIRED WATERS BY SEGMENT

Segment	Waterbody Name	Reason for Impairment
G-W	Minnesota River	Mercury and fecal coliform
W-1A	Stony Run Pomme de Terre River	Biota Fecal coliform, low oxygen and turbidity
W-21	Judicial Ditch #8 Chippewa River	Biota Mercury and fecal coliform

Source: MPCA 2004. Minnesota's Impaired Water and Total Maximum Daily Loads

7.2.5.3 Flora

The route alignment is primarily located within the Northern Glaciated Plains Ecoregion. The eastern portion of Swift County and southwestern portion of Kandiyohi County are in the Western Corn Belt Plains Ecoregion. Sections 6.1.5.3 and 7.1.5.3 describe the native vegetation found in remnant prairie communities within these ecoregions.

The USGS Gap Analysis Program (GAP) land cover types along the route alignment are shown in Table 36. The GAP land cover data shows that approximately 97 percent of the land along the route is in agricultural uses. Land cover types are defined in Appendix I.1

TABLE 36
GAP LAND COVER – PROPOSED ROUTE

Cover Type	Area (acres)	Percent of Route
Agriculture	20,845	97.2
Wetland/Riparian/Open Water	290	1.4
Forest	171	0.8
Shrubland	83	0.4
Prairie	1	0.0
Developed	46	0.2

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data

Along the route, there are several areas where natural vegetation is being managed. Danvers and Sena WMAs contain grassland, cultivated and wetland vegetation. There are two FWS WPAs (Menzel and Hillman) located along the route, containing wetland and grassland vegetation (DNR 2005). The route alignment does not cross the WMAs or WPAs. Within one mile of the route alignment, there are three additional WMAs (Claire Rollings, Cuka and Tjosaas) and seven additional WPAs, including Redhead Marsh, Krogsrud, Person, Akron, Raymond, Rambow and Priam.

Along the route there are approximately 3.5 acres of FWS grassland easements. Similar to habitat easements, the FWS holds tillage, cropping and disturbance rights to the upland, and protects the wetlands on these lands, which are used for waterfowl production. The landowner retains rights to graze and hay land. There are approximately 848 acres of FWS wetland easements along the route alignment.

Along the route, there are nine native plant communities listed by the DNR: three mesic prairie communities and four dry hill prairie communities along the Segment W-1A alignment and one mesic prairie community and one wet prairie community along the Segment W-29 alignment. Within one mile of the route alignment, there are 36 additional natural communities listed by the DNR (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Appendix M.1 lists the plant species found in these natural communities. DNR data describing railroad prairies was analyzed for the route. Results of the analysis are showing in Section 7.2.6.

7.2.5.4 Fauna

Although 97 percent of the land adjacent to the route alignment is cultivated, there are several WMAs and WPAs along the route that provide habitat for a variety of animal species. Section 6.1.5.4 lists the wildlife that can be found in these habitats.

Most of the route is adjacent to cultivated land, which provides some cover for the common fauna known to inhabit Minnesota. A discussion of common wildlife and avian resources is given in Section 6.1.5.4, and a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

Along Willmar Route 2, the Segment G-W and W-1A alignments pass through areas designated by the FWS and DNR joint assessment as having both important grassland and wetland habitats for waterfowl (FWS and DNR 2005). The high priority areas are identified in Appendix K.5. See Section 6.1.5.4 for a discussion of the joint assessment.

7.2.5.5 Impacts and Mitigation: Natural Environment

Air Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to air quality along Willmar Route 2.

Water Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to water quality along Willmar Route 2. For Willmar Route 2, permanent impacts to wetlands are possible along Segments W-12B, W-19 and W-29, where the route alignment spans wetlands wider than 1,000 feet. The wide wetland along W-19 is also DNR PWI 114W; the palustrine emergent wetland along W-12B is DNR PWI 92W. It is anticipated that a maximum of one structure may be placed in each of these three wetlands, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact and 20,000 square feet (0.46 acres) of temporary impact per wetland. The Applicants will obtain utility crossing permits from the DNR for any PWI water crossed.

Flora

As stated in Section 6.1.5.5, native vegetation is anticipated to be minimal and impacts to WPAs and Federally-funded WMAs may require a compatibility analysis.

The Applicants will span the surveyed prairie remnants along the route. It is possible that one of the DNR-listed natural communities (a mesic prairie associated with Sena WMA) will be impacted by the route along the Segment W-29 alignment. The natural community is mapped on both sides of the roadway. The route alignment is proposed to be on the south side of the road where the community is approximately 1,000 feet wide, and will avoid the north side of the roadway where Sena WMA is located and the natural community is approximately 3,600 feet wide.

An approximately 1.0-acre easement within Hillman WPA is anticipated. The Applicants estimate that a 5.9-acre easement within Sena WMA will be necessary. No easements within FWS habitat easements are anticipated.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

As stated in Section 6.1.5.5, there is minimal potential for the displacement of wildlife and loss of habitat from construction of Willmar Route 2.

Similar to Morris Route 1, avian collisions are a possibility after construction. Along Willmar Route 2, the Segment G-W and W-1A alignments pass 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 Applicants will work with the FWS and DNR to minimize impacts along these segments as necessary.

See Section 6.1.5.5 for potential impacts and mitigation measures related to fauna along Willmar Route 2.

7.2.6 RARE AND UNIQUE NATURAL RESOURCES

Table 37 lists the rare or unique resources identified within one mile of Willmar Route 2. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Willmar Route 2 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 37
RARE AND UNIQUE RESOURCES

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Mucket mussel	2	Actinonaias ligamentina	Not Listed	THR	S2	Medium to large rivers in sand and gravel
Carolina Foxtail	2	Alopecurus carolinianus	Not Listed	NON	NR	Wet meadows, wet prairies
Low Milk-vetch	2	Astragalus lotiflorus	Not Listed	NON	NR	Tallgrass prairie
Upland Sandpiper	5	Bartramia longicauda	Not Listed	NON	S4	Dry prairies
American Bittern	1	Botaurus lentiginosus	Not Listed	NON	S4	Large cattail and sedge marshes;, smaller bogs, wet meadows and hayfields are used for forage.
Larger Water-starwort	2	Callitriche heterophylla	Not Listed	SPC	S3	Shallow water or mud of springs and stream pools
Mouse-ear Chickweed	1	Cerastium brachypodum	Not Listed	NON	NR	Dry oak savannah
Small White Lady's-slipper	3	Cypripedium candidum	Not Listed	SPC	S3	Wet to wet-mesic prairies and calcareous fens
Three Stamened Waterwort	2	Elatine triandra	Not Listed	NON	NR	Mud flats or floating in shallow waters of lakes and ponds
Few-flowered Spike-rush	1	Eleocharis quinqueflora	Not Listed	SPC	S3	Calcareous fens
Spike mussel	1	Elliptio dilatata	Not Listed	SPC	S3	Small to large streams, occasionally lakes, in mud or gravel
Ball Cactus	6	Escobaria vivipara	Not Listed	END	S1	Rock outcrops
Creek Heelsplitter	1	Lasmigona compressa	Not Listed	SPC	S3	Small to medium rivers in sand and fine gravel
Black Sandshell	1	Ligumia recta	Not Listed	SPC	S3	Medium to large rivers in riffles or raceways in mud and sand
Mudwort	2	Limosella aquatica	Not Listed	SPC	S3	Stream banks, shallowmargins or prairie ponds and rock pools
Forget-me-not	3	Myosotis verna	Not Listed	NON	NR	Clearings in dry woods
Mousetail	2	Myosurus minimus	Not Listed	NON	S4	Shallow still or slowly flowing waters. Muddy or sandy shorelines and areas with fluctuating water levels

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Powesheik Skipper	1	Oarisma powesheik	Not Listed	SPC	S3	Wet mesic prairie with native grasses, sedges and a significant number of plants in the sunflower family
Hair-like Beak-rush	1	Rhynchospora capillacea	Not Listed	THR	S2	Calcareous fens and bogs
Tumblegrass	1	Schedonnardus paniculatus	Not Listed	SPC	S3	Tallgrass prairies
Regal Fritillary	2	Speyeria idalia	Not Listed	SPC	S3	Large grassland areas or lightly grazed pasture lands with prairie remnants. Larval plants and violets.
Marsh Arrow-grass	1	Triglochin palustris	Not Listed	NON	S4	
Dry Prairie (Southwest) Hill Subtype	13		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	20		Not Listed	None	S2	
Wet Prairie	3		Not Listed	None	S2	
Rock Outcrop (Southwest) Subtype	9		Not Listed	None	NR	

** 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

The DNR Minnesota County Biological Survey (MCBS) data was consulted to determine if there were areas with medium, high or outstanding biodiversity significance along the route. Within the route, there are three areas with moderate biodiversity significance and four areas with high biodiversity significance. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Willmar Route 2. There are no DNR railroad prairie communities along Willmar Route 2.

Initial surveys conducted in June and October 2005 identified four remnant dry prairie communities along the Segment W-1A alignment (GES 2005).

7.2.6.1 Impacts and Mitigation: Rare and Unique Natural Resources

A search of the DNR's Minnesota Natural Heritage Database identified one State threatened species (ball cactus), two State threatened species (mucket mussel and hair-like beak-rush) and 10 species of special concern within one mile of the proposed route alignment. Forty five DNR listed natural communities are within one mile of the proposed route alignment.

The Applicants will attempt to span any habitats where native prairie fragments or other unique plant communities have been recorded or could occur. A survey for special status species will be conducted once a route alignment is approved.

It is possible that one of the DNR-listed natural communities (a mesic prairie associated with Sena WMA) will be impacted by the route along the Segment W-29 alignment. Several of the listed special concern species are prairie species; therefore their habitat could potentially be impacted by construction of the line. The natural community is mapped on both sides of the roadway; the route alignment is proposed to be on the south side of the road where the community is approximately 1,000 feet wide, and will avoid the north side of the roadway where Sena WMA is located and the natural community is approximately 3,600 feet wide. If impacts are unavoidable, a special status species survey will be performed and the Applicant will continue to work the DNR to develop ways to minimize impacts to rare species as well as appropriate mitigation.

The ball cactus, a State endangered species, occurs in rock outcrops. Along Willmar Route 2, the Applicants should be able to span all rock outcrops. If construction within outcrops cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

The mucket mussel, a State threatened species, and other special status mussels, occur in rivers such as the Minnesota River and Pomme de Terre River. The Applicants will avoid impacting these species by spanning the rivers.

The hair-like beak-rush, a State threatened species, occurs in calcareous fens. Several of the listed special concern species 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 Applicants will attempt to span streams and wetlands along the route whenever feasible. Whenever it is not feasible to span, a survey will be conducted to determine the presence of special status species and coordination will occur with the appropriate agencies to avoid and minimize any impact. The Applicants 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.

7.3 PREFERRED ROUTE

With regard to the Willmar System Alternative, Willmar Route 1 is preferred to Willmar Route 2 for the following reasons:

- Willmar Route 1 will follow existing transmission line ROW for approximately 20 percent of the route and 66 percent of the route parallels transportation ROW. In contrast, nine percent of Route 2 will follow existing transmission line right of way and 65 percent of the route uses transportation ROW. Willmar Route 1 therefore is more consistent with the State's nonproliferation policy expressed by the Minnesota Supreme Court in [People for Environmental Enlightenment and Responsibility, Inc. (PEER) vs. Minnesota Environmental Quality Council, 266 N.W.2d 858, 868 (Minn. 1978) and confirmed in Minnesota Rules part 4400.3150, items H and J] of preferring existing ROWs to new ROW (See Section 5.3).
- Willmar Route 1 will be less expensive to construct, operate and maintain. Costs for Route 1 are estimated between $24,090,818 and $26,288,026, in comparison to Route 2 construction costs of between $27,019 and $29,483,445.
- Willmar Route 1 will have less agricultural impact. Route 1 will cause 13.6 acres of permanent impacts compared to Route 2's 15.2 acres of permanent impacts. Similarly, Route 1 will have approximately 478 acres of temporary impacts compared to Route 2 536 acres of temporary impacts.

- Willmar Route 1 will have less impact on wetlands than Route 2. Route 1 is expected to result in approximately 1,000 square-feet of permanent impacts to a wetland along Segment W-12B. In contrast, Route 2 is expected to result in a total of approximately 3,000 square feet of permanent impacts to three wetlands along Segments W-12B, W-19 and W-29.
- Willmar Route 1 will have less impact on flora and fauna than Route 2. The majority (86 percent) of the route follows already disturbed corridors in comparison to 74 percent of Route 2. Route 1 will likely require 3.8 acres of easement in a WMA in comparison to 1 acre of easements in a WPA and 5.9 acres of easements in a WMA along Route 2.
- The Applicants believe that Willmar Route 1 also best addresses public concerns raised at public meetings, by utilizing existing right of way and minimizing impacts to landowners, businesses, population concentrations, agricultural resources and wildlife resources.

TABLE 38
FACTORS CONSIDERED FOR THE WILLMAR ROUTE

Factor	Willmar Route 1	Willmar Route 2	Lesser Impacts
Effects on human settlement and aesthetics			
Displacement	None	None	-
Noise	Noise levels will be within state standards and below background levels	Same	-
Aesthetics	Structures and transmission line will affect viewscape. However, 86 percent of the route follows existing disturbed (transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 57 homes along the route	Structures and transmission line will affect viewscape. However, 74 percent of the route follows existing disturbed (transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 43 homes along the route	Route 2
Cultural Values	None	None	--
Recreation	There would be minimal visual impact to Big Stone NWR and the 2 WMAs and 7 WPAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	There would be minimal visual impact to Big Stone NWR and the 5 WMAs and 9 WPAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	--
Public Services	None	None	--
Socioeconomic	Minor positive short-term effects from construction activities to local economy expected.	Minor positive short-term effects from construction activities to local economy expected.	--
Effects on Public health and safety	None	None	--

Factor	Willmar Route 1	Willmar Route 2	Lesser Impacts
Effects on land-based economies	Pole placement will impact farmland throughout the corridor. Temporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 478 acres of agricultural land. Permanent impacts are estimated at 13.6 acres	Pole placement will impact farmland throughout the corridor. Temporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 536 acres of agricultural land. Permanent impacts are estimated at 15.2 acres	Route 1
Effects on archaeological and historic resources	Direct impacts to cultural resources will be avoided whenever possible. There are three archeaological site within 500' and 167 structures within 1 mile of alignment	Direct impacts to cultural resources will be avoided whenever possible. There is one archeaological site within 500' and 117 structures within 1 mile of alignment	Route 2
Effects on the natural environment			
Air	There will be no measurable impacts relative to ozone. Temporary air quality impacts will be caused by construction-related emissions.	Same	--
Water	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands probable in Segment W-12B. One structure in one wetland would cause 1,000 ft2 of permanent impacts.	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands probable in Segments W-12B, W-19 and W-29. One structure in each of three wetlands would cause 3,000 ft2 of permanent impacts.	Route 1
Flora/Fauna	Nominal impacts are expected to flora given that the majority (86 percent) of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collision. The route passes through high priority areas identified by the FWS/DNR joint assessment. 3.8 acres of easements will likely be required in Claire Rollings WMA	Nominal impacts are expected to flora given that the majority (74 percent) of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collision. The route passes through high priority areas identified by the FWS/DNR joint assessment. There will possibly be a structure placed in Sena WMA . 1.0 ac of easements will be required in Hillman WPA and 5.9 acres of easements in Sena WMA,	Route 1
Effects on rare and unique natural resources	One wet prairie community (identified by MCBS) may be directly impacted in Segment W-2	One mesic prairie community (identified by MCBS) may be directly impacted in Segment W-29	--
Application of design option that maximize energy efficiencies, mitigate adverse environmental effects and could accommodatge expansion of transmission capacity	Applicants will work with the affected landowners to use a design that mitigates the impact on the affected landowners and the ROW. Expansion potential exists. However, there are no known or likely plans to add additional transmission capacity along the proposed route. Therefore, the design is appropriate to this Project and maximizes energy efficiency.	Same	--

Factor	Willmar Route 1	Willmar Route 2	Lesser Impacts
Use or paralleling of existing ROWs, survey lines, natural division lines and agricultural field boundaries	Majority (86 percent) of the route follows existing rights of way; agricultural field lines and natural division lines are used for the majority of the remainder of the route.	Majority (74 percent) of the route follows existing rights of way; agricultural field lines and natural division lines are used for the majority of the remainder of the route.	Route 1
Use of existing large electric power generating plant site	N/A	N/A	--
Use of existing transportation, pipeline and electrical transmission systems or ROWs	20 percent of the route will follow existing transmission line right of way; 66 percent uses transportation right of way.	9 percent of the route will follow existing transmission line right of way; 65 percent uses transportation right of way.	Route 1
Electrical System Reliability	Line and route designed to provide reliable outlet capability	Same	--
Costs of constructing, operating and maintaining the facility which are dependent on design and route	Construction costs estimated between $24,090,818 and $26,288,026	Construction costs estimated between $27,019,157 and $29,483,445	Route 1
Adverse human and natural environmental effects which cannot be avoided	Unavoidable adverse impacts include the physical impacts to the land (primarily agricultural land) associated with the Project. The Applicants will implement measures as described in the environmental analysis and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects. These effects are similar for both routes proposed.		
Irreversible and irretrievable commitments of resources	Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this project that are irreversible and irretrievable, but include those resources primarily related to construction. Construction resources that will be used include aggregate resources, concrete, steel, and hydrocarbon fuel. These resources will be utilized to construct the Project. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels. These commitments of resources are similar for both routes proposed.		

8.0 GRANITE FALLS CORRIDOR: ENVIRONMENTAL INFORMATION

8.1 ROUTES 1 AND 3

8.1.1 DESCRIPTION OF ENVIRONMENTAL SETTING

Granite Falls Routes 1 and 3 lie within the Prairie Grassland region of Minnesota. According to the DNR, the routes lie primarily within the Minnesota River Prairie subsection of the Prairie Parkland Province under the Ecological Classification System (ECS). A small portion of the routes in extreme southwestern Lac Qui Parle County, Minnesota and western Yellow Medicine County lies within the Coteau Moraines subsection of the Prairie Parkland Province.

The Minnesota River Prairie is a landscape dominated by large till plains on either side of the Minnesota River, and is characterized by gently rolling terrain, except where it is split by the broad Minnesota River Valley. The Coteau Moraines was also created by glacial erosion and deposition, and is characterized by gently rolling hills, streams, rivers, and shallow prairie lakes and wetlands. Elevations along Route 1 range from approximately 830 to 1,710 feet above mean sea level, with the higher elevations generally associated with the Coteau Moraines subsection.

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 most of the smaller watercourses have been channelized to increase the acreage of land available for agricultural production.

The majority of Granite Falls Routes 1 and 3 crosses cropland used to grow corn and soybeans. Communities near the route are generally small farm-based towns. The primary exception is Granite Falls, a level 4 regional trade center located at the eastern end of the route. A few WMAs are present near the route, along with several wetlands. Relatively few forested areas are present, especially in the western and central sections of the route. Most wooded areas are adjacent to farmsteads, or are located in the Minnesota River Valley near Granite Falls.

8.1.2 HUMAN SETTLEMENT

8.1.2.1 Public Health and Safety

See Section 6.1.2.1 for a general discussion of public health and safety along Granite Falls Routes 1 and 3.

Routes 1 and 3

One issue associated with high-voltage transmission lines is the proximity of those lines to airport facilities. Two airports are located in the vicinity of Granite Falls Routes 1 and 3. The Granite Falls Airport is located near segment G-53 but is outside of any ordinance zones. The route would be within the 10,000-foot buffer in the future. The Canby Airport is located near segments G-29, G-30, G-31, and G-33. All of these segments would be affected by Airspace Obstruction Zoning and the portion of these segments located within Sections 21, 22, and 25, Township 115 North, Range 45 West would also be affected by Land Use Safety Zoning.

8.1.2.2 Commercial, Industrial and Residential Land Use

Route 1

Zoning information was obtained for the counties and cities along Granite Falls Route 1 (Appendix I.6 and Appendix I.7) which includes Lac Qui Parle and Yellow Medicine counties. There are no communities in Minnesota within one mile of this portion of the route alignment.

Table 39 shows that over 97 percent of the land in Granite Falls Route 1 is agricultural. Segment G-15 encompasses the majority of the agricultural land. Appendix I.1 defines the land use types identified in Table 39. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 39
GAP LAND USE DATA FOR GRANITE FALLS ROUTE 1

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agriculture	1,334.61	97.08
Wetland/Riparian/Open Water	15.01	1.09
Forest	25.20	1.83
Shrubland	0.0	0.0
Prairie	0.0	0.0
Developed	0.0	0.0
Total	1,374.83	100.00

Lac Qui Parle

Granite Falls Route 1 primarily crosses land zoned as agricultural. According to the county zoning ordinance, transmission lines are a permitted use (Appendix I.6). No schools, registered daycare facilities, churches, or cemeteries were identified along the route. No airports were located along the route.

Yellow Medicine

Granite Falls Route 1 primarily crosses land zoned as agricultural (Appendix I.7 for Yellow Medicine County zoning maps). No schools, registered daycare facilities, churches, or cemeteries were identified along the route. No airports were located along the route.

Route 3

Zoning information was obtained for the counties and cities along Granite Falls Route 3 (Appendix I.6) which include Lac Qui Parle County. Marietta, Minnesota is the only community within one mile of the route alignment; Nassau is 1.5 miles from the route.

Table 40 shows that over 97 percent of the land in Granite Falls Route 3 is agricultural. Segments G-59, G-63 and G-70 encompass the majority of the agricultural land. Appendix I.1 defines the land use types identified in Table 40. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 40
GAP LAND USE DATA FOR GRANITE FALLS ROUTE 3

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agriculture	7,648.20	97.53
Wetland/Riparian/Open Water	154.58	1.97
Forest	39.12	0.50
Shrubland	0.0	0.0
Prairie	0.0	0.0
Developed	0.0	0.0
Total	7,841.90	100.0

Lac Qui Parle County

Granite Falls Route 3 primarily crosses areas zoned as agricultural; transmission lines are a permitted use in this zoning district according to the county ordinance (Appendix I.6). No schools, registered daycare facilities, churches, or cemeteries were identified along the route. No airports were identified along the route.

Routes 1 and 3

Zoning information was obtained for the counties and cities along Granite Falls Routes 1 and 3 (Appendices I.6 and I.7) which includes Lac Qui Parle and Yellow Medicine counties. There are three communities within one mile of the route alignment: Canby, Hazel Run, and Granite Falls.

As Table 41 shows, over 97 percent of the land in Granite Falls Routes 1 and 3 is agricultural. Segments G-32, G-39, G-45, and G-50 encompass the majority of the agricultural land. Appendix I.1 defines the land use types identified in Table 41. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 41
GAP LAND USE DATA FOR GRANITE FALLS ROUTES 1 AND 3

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agricultural	12,943.55	97.6
Wetland/Riparian/Open Water	180.38	1.5
Forest	42.99	0.3
Shrubland	32.10	0.3
Prairie	0.0	0.0
Developed	33.60	0.3
Total	13,232.57	100.0

Yellow Medicine County

Granite Falls Routes 1 & 3 primarily cross land that is zoned agricultural (zoning maps can be found in Appendix I.7). Some wetland and riparian areas are also crossed; these mainly consist of intermittent drainages and small streams.

There are two public schools near the alignment of routes 1 & 3 in Yellow Medicine County; Bert Raney Elementary School and Granite Falls Senior High School, both in Granite Falls. These schools both appear to be east of the alignment. Minnesota West Community and Technical College, a two-year college, is also located in Granite Falls, and appears to be adjacent to, if not within the edge of the 2000-foot wide alignment. There are two registered child care providers east of the alignment of Granite Falls Routes 1 and 3 in Yellow Medicine County (Granite Falls Head Start and Prairie Land Daycare/Head Start). There are nine churches within Granite Falls east of the alignment: Assembly of God Church, First Baptist Church, Open Door Baptist Church, St. Andrew Catholic Church, Grace Evangelical Free Church, Bergen Lutheran Church, Granite Falls Lutheran Church, St. Paul's Lutheran Church and Granite Falls United Church.

There are two cemeteries near the alignment of Routes 1 & 3 in Yellow Medicine County: St. Paul's Cemetery (immediately west of Granite Falls) and St. Andrews Cemetery (Minnesota Falls Township).

Neither the Canby airport nor the Granite Falls Municipal airports would be impacted by Granite Falls Routes 1 & 3.

Lac Qui Parle County

A very small portion of Routes 1 & 3 lies within Lac Qui Parle County; this portion crosses land zoned for agriculture. As noted in previous sections, the county ordinance considers transmission lines a permitted use on agricultural land.

No schools, registered daycare facilities, churches, cemeteries, or airports were identified near the Lac Qui Parle County portion of Routes 1 & 3.

8.1.2.3 Displacement

See Appendix O for a breakdown of the number of homes along the route alignment.

Route 1

There are no homes on Granite Falls Route 1 located within 300 feet of the route alignment. Since the route is a 345 kV transmission line, there may be instances where property is purchased per Minnesota Statute 116C.63, Subdivision 4 (sometimes referred to as "Buy the Farm"). This allows the property owner the option of having the property that the route alignment crosses to be purchased at the fair market value of the land. This option is the landowner's choice and it is difficult to determine which, if any, will elect it.

Route 3

There is one home on Granite Falls Route 3 located within 100 feet of the route alignment. There are no homes along Granite Falls Route 3 that are within 300 feet but greater than 100 feet from the route alignment. Since the route is a 345 kV transmission line, there may be instances where property is purchased per Minnesota Statute 116C.63, Subdivision 4 (sometimes referred to as "Buy the Farm"). This allows the property owner the option of having the property that the route alignment crosses to be purchased at the fair market value of the land. This option is the landowner's choice and it is difficult to determine which, if any, will elect it.

Routes 1 and 3

There is one home on Granite Falls Routes 1 and 3 located within 100 feet of the route alignment. There are three homes along Granite Falls Routes 1 and 3 that are within 300 feet but greater than 100 feet from the route alignment. Since the route is a 345 kV transmission line, there may be instances where property is purchased per Minnesota Statute 116C.63, Subdivision 4 (sometimes referred to as "Buy the Farm"). This allows the property owner the option of having the property that the route alignment crosses to be purchased at the fair market value of the land. This option is the landowner's choice and it is difficult to determine which, if any, will elect it.

8.1.2.4 Noise

See Section 6.1.2.4 for a general discussion of noise along Granite Falls Routes 1 and 3.

8.1.2.5 Aesthetics

Route 1

See Section 6.1.2.5 for a detailed discussion of the concepts of visual sensitivity and aesthetic impacts.

Granite Falls Route 1 runs through agricultural land on the border between Deuel County, South Dakota and Lac Qui Parle County; and on the border between Lac Qui Parle County and Yellow Medicine County. The route alignment follows local road ROWs. No cities are located within one mile of Granite Falls Route 1. Review of field data and aerial photography indicates that three homes are located within 500 feet of the route alignment; these are the high visual sensitivity areas for this route.

Preferred structures would be wood H-frame structures ranging from 80 to 120 feet high.

Route 3

Granite Falls Route 3 runs through agricultural land in Lac Qui Parle County approximately 2.25 miles east of the South Dakota border. An existing 115 kV transmission line runs parallel to the route alignment approximately one mile to the east. The only town located within one mile of the corridor is Marietta. Review of field data and aerial photography identified eight homes within 500 feet of the route alignment; these homes constitute the high visual sensitivity areas for Route 3.

Preferred structures would be the same for Granite Falls Route 3 as for Granite Falls Route 1.

Routes 1 and 3

Granite Falls Routes 1 and 3 run primarily through agricultural land; between Canby and Granite Falls, would be rebuilt on an existing 115 kV transmssion line. St. Leo and Hazel Run are also located within one mile of the routes. The primary visually sensitive area is the Minnesota River in the Granite Falls area along MN Highway 23. In contrast with the majority of the alignment, this area is characterized by wooded areas, a diverse ecological setting, high recreational value and the presence of the Minnesota River (which is a State-listed wild and scenic river in this area). River bluffs and the river valley dominate the viewshed. The visual sensitivity of this portion of the corridor is tempered, however, by the presence of man-made features, especially five transmission line crossings of the Minnesota River at the Granite Falls Substation. **Error! Reference source not found.** in Appendix J shows the viewshed along the Minnesota River Valley near Granite Falls.

Review of field data and aerial photography identified six homes within 500 feet of Granite Falls Routes 1 and 3.

West from the Hazel Run vicinity to the preferred structure will not be the same as those for Granite Falls Route 1. East from the Hazel Run vicinity to the Granite Falls Substation, the preferred structure would be wood H-frame structures ranging from 70 to 100 feet high.

8.1.2.6 Socioeconomic

Route 1

Granite Falls Route 1 is located in Lac Qui Parle and Yellow Medicine counties. Table 42 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Granite Falls Route 1. As can be seen in Table 42, Granite Falls Route 1 does not contain populations of disproportionately high minority populations or low-income populations.

TABLE 42
GRANITE FALLS ROUTE 1 POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Total Minority Population	Minority Population Percentage	Per Capita Income	Percent of Population Below Poverty Level
Minnesota	4,919,749	521,494	10.6	$23,198	7.9
Lac Qui Parle County	3,315	102	3.1	$17,399	10.2
Block Group 3, Census Tract 9802	897	5	0.6	$19,392	12.5
Yellow Medicine County	4,441	511	11.5	$17,120	12.1
Block Group 3, Census Tract 9702	809	9	1.1	$18,299	9.1

Table 43 identifies the top three leading industries in Lac Qui Parle and Yellow Medicine counties.

TABLE 43
LEADING COUNTY INDUSTRIES

Geographic Area	Industry	Percent of Workforce
Lac Qui Parle County	Educational, health and social services	23.1
	Agriculture, forestry, fishing and hunting, and mining	14.4
	Manufacturing	13.1
Yellow Medicine County	Educational, health and social services	23.3
	Manufacturing	18.1
	Agriculture, forestry, fishing and hunting, and mining	11.6

Route 3

Granite Falls Route 3 is located in Lac Qui Parle and Yellow Medicine counties. Table 44 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Granite Falls Route 3. As can be seen in Table 44, Granite Falls Route 3 does not contain populations of disproportionately high minority populations or low-income populations.

TABLE 44
GRANITE FALLS ROUTE 3 POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Total Minority Population	Minority Population Percentage	Per Capita Income	Percent of Population Below Poverty Level
Minnesota	4,919,749	521,494	10.6	$23,198	7.9
Lac Qui Parle County	3,315	102	3.1	$17,399	10.2
Block Group 3, Census Tract 9802	897	5	0.6	$19,392	12.5
Block Group 1, Census Tract 9802	809	3	0.3	$15,325	10.2
Block Group 2, Census Tract 9802	529	5	1.0	$14,371	12.4
Yellow Medicine County	4,441	511	11.5	$17,120	12.1
Block Group 3, Census Tract 9702	809	9	1.1	$18,299	9.1

Table 45 identifies the top three leading industries in each county within the route.

TABLE 45
LEADING COUNTY INDUSTRIES

Geographic Area	Industry	Percent of Workforce
Lac Qui Parle County	Educational, health and social services	23.1
	Agriculture, forestry, fishing and hunting, and mining	14.4
	Manufacturing	13.1
Yellow Medicine County	Educational, health and social services	23.3
	Manufacturing	18.1
	Agriculture, forestry, fishing and hunting, and mining	11.6

Routes 1 and 3

Granite Falls Routes 1 and 3 are located in Lac Qui Parle and Yellow Medicine counties. Table 46 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Granite Falls Routes 1 and 3. As can be seen in Table 46, Granite Falls Routes 1 and 3 does not contain populations of disproportionately high minority populations or low-income populations.

TABLE 46
GRANITE FALLS ROUTES 1 AND 3 POPULATION AND ECONOMIC CHARACTERISTICS

Location	Population	Total Minority Population	Minority Population Percentage	Per Capita Income	Percent of Population Below Poverty Level
Minnesota	4,919,749	521,494	10.6	$23,198	7.9
Lac Qui Parle County	3,315	102	3.1	$17,399	10.2
Block Group 3, Census Tract 9802	897	5	0.6	$19,392	12.5
Yellow Medicine County	4,441	511	11.5	$17,120	12.1
Block Group 1, Census Tract 9701	775	45	5.8	$20,135	9.2
Block Group 5, Census Tract 9701	603	119	19.7	$18,283	12.2
Block Group 3, Census Tract 9702	809	9	1.1	$18,299	9.1
Block Group 1, Census Tract 9703	912	14	1.5	$15,021	10.4

Table 47 identifies the top three leading industries in each county within the route.

TABLE 47
LEADING COUNTY INDUSTRIES

Geographic Area	Industry	Percent of Workforce
Lac Qui Parle County	Educational, health and social services	23.1
	Agriculture, forestry, fishing and hunting, and mining	14.4
	Manufacturing	13.1
Yellow Medicine County	Educational, health and social services	23.3
	Manufacturing	18.1
	Agriculture, forestry, fishing and hunting, and mining	11.6

8.1.2.7 Cultural Values

Cultural values are defined in Section 6.1.2.7 above. Like the communities in the vicinity of the other proposed routes, Granite Falls Routes 1 and 3 include rural hubs associated with current or abandoned railroad corridors, including the towns of Marietta, Mehurin, Canby, Hazel Run, and Granite Falls. Like the other routes, the cultural values of these communities appear largely based in agriculture, light industry, tourism, and as transportation hubs through the prairies, lakes and rivers of West Central Minnesota. Agricultural row crops important to the area include wheat, corn and soybeans. Cities like Granite Falls have developed light industrial parks to accommodate new businesses and diversify the economic base.

While natural recreational opportunities are less prominent in the vicinity of Granite Falls Routes 1 and 3 (compared to the other routes), Granite Falls is an important center for the enjoyment of the Minnesota River valley and surrounding communities. Heritage tourism is also important along Granite Falls Routes 1 and ute 3. Community and county historical societies are active in promoting the historic character of their resident communities. Historic railroad corridors, highways such as the King of Trails (U.S. Highway. 75), and NRHP-recognized structures, districts, and museums provide excellent opportunities for recreation related to interests in heritage.

8.1.2.8 Recreation

There are a variety of outdoor recreational opportunities along the routes, including snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting and nature observation. Appendix K.3 shows the locations of WMAs within the vicinity of the routes. The detailed route maps in Appendix H identify the WMAs in more detail.

Route 1

There are no WMAs located within one mile of the route alignment; Mound Springs WMA and Scientific Natural Area (SNA) are between one and a quarter and two miles south of Segment G-15A. There is one unnamed FWS WPA in Manfred Township located within one mile of Segment G-15A. The route alignment does not cross any snowmobile trails.

Route 3

There are three WMAs located along Granite Falls Route 3: Walter, Indigo and Plantation. Salt Lake WMA is located within one mile of the route alignment. Yellow Bank Hills SNA is within one mile of the route alignment, and the adjacent Pegg Lake is known for attracting waterfowl. Other recreational opportunities in the Yellow Bank Hills SNA include viewing rare plant species and native prairie vegetation (DNR 2005). There are no WPAs within the route; within one mile there are five unnamed WPAs. The route alignment does not cross any snowmobile trails.

Routes 1 and 3

There are two WMAs located along Granite Falls Routes 1 and 3: Lanners and Omro. Within one mile of the route alignment, there are five additional WMAs: Reserve, Oshkosh, Kaibab, Stokke and Tyro. Blue Devil Valley SNA is within one mile of the eastern end of the route alignment. Recreational opportunities at this SNA include wildlife viewing and hiking along trails through the bedrock outcroppings (DNR 2005). There are no WPAs within one mile of the route alignment.

The Minnesota River is designated as a Wild and Scenic River from the Lac Qui Parle Dam to Franklin, Minnesota, which includes Granite Falls. Recreational opportunities within this stretch of the river include canoeing, hiking trails, camping, boating access and wildlife observation. The Minnesota River Valley National Scenic Byway runs through Granite Falls on U.S. Highway 212 and County Road 67 (Explore Minnesota 2005).

There is one snowmobile trail that runs adjacent to much of Segment G-50.

8.1.2.9 Public Services

Granite Falls Routes 1 and 3 includes Lac Qui Parle and Yellow Medicine counties.

Route 1

This is a rural area with very few public services.

Route 3

Marietta is the only community within one mile of the route alignment. This is a rural area with very few public services.

Routes 1 and 3

There are three communities within one mile of the route alignment: Canby, Hazel Run, and Granite Falls. This is a rural area; Granite Falls is the primary community 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. For a discussion of potential airport conflicts see Section 6.1.2.2.

8.1.2.10 Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during the construction and operation of the facility. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the pole locations), impacts will be minimal and no mitigation is anticipated.

Coordination with local government representatives and citizens may be necessary as the route is finalized to minimize or avoid impacts to sensitive land uses, specifically the two cemeteries identified near the route alignment.

Displacement

Applicants will work with landowners to make alignment adjustments to avoid any displacements and maximize distance to homes. No displacements are anticipated.

Noise

See Section 6.1.2.10 for potential impacts and mitigation measures related to noise along Granite Falls Routes 1 and 3.

TABLE 48
PREDICTED AUDIBLE NOISE FROM PROPOSED TRANSMISSION LINES OPERATED AT MAXIMUM CAPACITY (DBA)

Conductor Size	Distance from center of transmission line corridor (feet)								
	-300	-200	-100	-50	0	50	100	200	300
H-Frame, 230 kV transmission line with 954 ACSS	34	36	39	43	44	43	39	36	34
Single Pole Davit Arm, 230 kV transmission line with 954 ACSS	33	35	38	41	41	40	37	35	33
H-Frame, 230 kV transmission line with 1272 ACSR	32	34	37	40	42	40	37	34	32
Single Pole Davit Arm, 230 kV transmission line with 1272 ACSR	31	33	36	38	39	38	35	32	30
H-Frame, 345 kV transmission line with bundled 954 ACSS	38	40	43	45	46	45	43	40	38
Single Pole Davit Arm, 345 kV transmission line with bundled 954 ACSS	35	37	40	43	43	41	39	36	35
H-Frame, 345 kV transmission line with bundled 1272 ACSR	36	38	41	43	44	43	41	38	36
Single Pole Davit Arm, 345 kV transmission line with bundled 1272 ACSR	33	35	38	41	41	39	37	34	33
H-Frame, 345 kV transmission line operated at 230 kV with bundled 954 ACSS	17	19	22	24	25	24	22	19	17
Single Pole Davit Arm, 345 kV transmission line operated at 230 kV with bundled 954 ACSS	14	16	19	22	22	20	18	15	13
H-Frame, 345 kV transmission line operated at 230 kV with bundled 1272 ACSR	15	17	20	22	23	22	20	17	15
Single Pole Davit Arm, 345 kV transmission line operated at 230 kV with bundled 1272 ACSR	12	14	17	20	20	18	16	13	11

Aesthetics

See Section 6.1.2.10 for potential impacts and mitigation measures related to aesthetics along Granite Falls Routes 1 and 3.

Socioeconomic

Section 6.1.2.10 discusses socioeconomic impacts and mitigation applicable to Granite Falls Route 1 and Route 3.

It is anticipated that the majority of workers needed for this Project, other than earth movers, will be supplied from the Applicants' construction workforce for the Canby Substation. It is anticipated that Western will bid out the work for the Granite Falls Substation. Lineman positions that cannot be filled by the Applicants will be contracted out. No permanent net change in workforce is projected.

Cultural Values

See Section 6.1.2.10 for potential impacts and mitigation measures related to cultural values along Granite Falls Routes 1 and 3.

Recreation

Route 1

No impacts to recreational resources are anticipated, and no mitigation is necessary.

Route 3

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants intend to and will work diligently to avoid any direct impacts to WMAs within the route. Although the route alignment runs adjacent to the western edge of Plantation WMA, the Applicants will place structures so that no direct impacts to this resource would result, as practical. An approximately 3.7-acre easement within Plantation WMA is anticipated. The proposed transmission line will likely be visible from the Yellow Bank SNA, as well as the WMAs and WPAs within one mile of the route alignment. The route will not interfere with the use of those recreational resources, and no mitigation is necessary.

Routes 1 and 3

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants will attempt to avoid any direct impacts to WMAs within the route. It should not be necessary to place structures in Omro WMA because the transmission line can be routed to pass north of the northern edge of the resource. However, an easement (approximately 0.3 acres) will still be required due to the proximity of the route alignment to the WMA. Lanners WMA is wider than 1,000 feet where the route alignment crosses; it is therefore likely that structures will be placed in the WMA. Because the proposed route alignment is a rebuild of an existing transmission line, the structures likely will be placed in an existing transmission corridor, and where feasible, structure for structure replacement will occur and will not permanently impact previously undisturbed habitat. An approximately 6.8-acre easement within Lanners WMA is anticipated.

The proposed transmission line will likely be visible from the Blue Devil Valley SNA, the Minnesota River, and the WMAs and WPAs within one mile of the route alignment, but will not be a new visual feature since the route is a rebuild of an existing transmission line along these segments. The route will not interfere with the use of those recreational resources.

Public Services

No impact is expected to public services along Granite Falls Routes 1 and 3.

8.1.3 LAND-BASED ECONOMICS

8.1.3.1 Agriculture

Route 1

Along Granite Falls Route 1, approximately 98 percent of the land is used for agriculture (USGS 2004), and approximately 93 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (USDA NRCS 2005).

According to the 2002 Census of Agriculture, Yellow Medicine County has had the average farm size decrease 3 percent and the total land in farms increase by 7 percent between 1997 and 2002. The number of full-time farms has increased by 85 farms during that time period. Crop sales in 2002 for Yellow Medicine County were $86,631,000 (62 percent of agricultural products sold) and livestock sales were $52,218,000 (38 percent). Crops in Yellow Medicine County are primarily corn and soybeans (USDA 2002).

The route does not cross any center pivot irrigation systems.

Route 3

Along Granite Falls Route 3, approximately 98 percent of the land is used for agriculture (USGS 2004), and approximately 95 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (USDA NRCS 2005).

According to the 2002 Census of Agriculture, Lac Qui Parle County has had the average farm size decrease 5 percent and the total land in farms increase by 9 percent between 1997 and 2002. The number of full-time farms has increased by 120 farms during that time period. Crop sales in 2002 for Lac Qui Parle County were $78,189,000 (69 percent of agricultural products sold) and livestock sales were $34,963,000 (31 percent). Crops in Lac Qui Parle County are primarily corn and soybeans (USDA 2002).

Agricultural data for Yellow Medicine County is described above for Granite Falls Route 1.

The route crosses two center-pivot irrigation systems along the Segment G-70 alignment.

Routes 1 and 3

Along Granite Falls Routes 1 and 3, approximately 98 percent of the land is used for agriculture (USGS 2004), and approximately 95 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (USDA NRCS 2005).

Agricultural data for Yellow Medicine County is described above for Granite Falls Route 1. Agricultural data for Chippewa County is described in Section 7.1.3.1.

The route alignment does not cross any center pivot irrigation systems.

8.1.3.2 Forestry

Route 1

Granite Falls Route 3 is primarily grassland.

Route 3

Granite Falls Route 3 is primarily grassland.

Routes 1 and 3

Granite Falls Routes 1 and 3 are primarily grassland.

8.1.3.3 Tourism

Route 1

There is one unnamed FWS WPA in Manfred Township located within one mile of Segment G-15A. Tourism along Granite Falls Route 1 is likely limited to bird watching, hunting and fishing opportunities.

Route 3

There are three WMAs located along Granite Falls Route 3: Walter, Indigo and Plantation. Salt Lake WMA is located within one mile of the proposed route alignment; both hunters and birdwatchers travel to this area. Yellow Bank Hills SNA is within one mile of the proposed route alignment, and the adjacent Pegg Lake is known for attracting waterfowl.

Routes 1 and 3

The Minnesota River Valley National Scenic Byway runs through Granite Falls on U.S. Highway 212 and County Road 67.

Historical museums within the vicinity of the route alignment include the Yellow Medicine Historical Museum and the Volstead Museum in Granite Falls. The Yellow Medicine Historical Museum displays Native American artifacts, including a log cabin, a church and a heritage research center on its grounds. The Volstead Museum is the former home of U.S. Congressman Andrew J. Volstead, who wrote the 1920 Prohibition Act and was instrumental in creating farmer cooperatives through the 1922 Capper-Volstead Act. The front parlor is available for viewing and displays memorabilia related to Congressman Volstead (Explore Minnesota 2004).

Granite Falls hosts Western Fest in midsummer, which features a parade, street dancing and a rodeo, and Ole and Lena Days in midwinter, featuring a Scandinavian food fair, medallion hunt and snow sculpting. Prairie's Edge Casino Resort, also located in Granite Falls, attracts tourists to the area as well (Explore Minnesota 2004).

8.1.3.4 Mining

Route 1

The glacial cover along Granite Falls Route 1 consists of approximately 300 feet of till overlying a thick unit of Cretaceous sediments (approximately 150 feet). 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.

No sand and gravel mining operations or rock quarries were identified along Granite Falls Route 1.

Route 3

The glacial cover along Granite Falls Route 3 consists of till, ranging from approximately 100 feet in thickness at the northern end of the proposed route alignment to roughly 300 feet in thickness at the southern end. Buried and near-surface sand and gravel deposits are interspersed in the till. Cretaceous shale and sandstone underlie the glacial till; Precambrian metamorphic rock lies beneath the Cretaceous deposits.

No sand and gravel mining operations or rock quarries were identified along Granite Falls Route 3.

Routes 1 and 3

The glacial cover along Granite Falls Routes 1 and 3 ranges from approximately 300 feet of till at the western end to less than 100 feet of till at the eastern terminus in Granite Falls. The glacial till is inundated with many surficial and buried sand and gravel lenses. River terrace deposits associated with the Minnesota River are present at the eastern end of the proposed route alignment. Cretaceous shale and sandstone lie beneath the majority of the proposed route alignment with the exception of the eastern portion near Granite Falls, where the Cretaceous formations are absent. Precambrian crystalline bedrock underlies the Cretaceous formations, or lies directly beneath the glacial deposits where the Cretaceous bedrock is absent.

Aggregate sites and rock quarries are located mainly in the vicinity of Granite Falls at the eastern end of the proposed route alignment.

8.1.3.5 Impacts and Mitigation: Land-Based Economies

Agriculture

During construction, temporary impacts such as soil compaction and crop damages within the ROW are likely to occur. The Applicants will work with landowners to minimize impacts to farming operations along the route alignment, such as aligning the transmission line along section and field lines. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Route 1

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the proposed route alignment. The Applicants estimate permanent impacts to agricultural lands at approximately 0.9 acres for Granite Falls Route 1. Approximately 93 percent of the soils impacted would be prime farmland or farmland of statewide importance.

The Applicants estimate that approximately 37 acres of agricultural land will be impacted temporarily by Granite Falls Route 1 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 1.0 acres.

Route 3

The Applicants estimate permanent impacts to agricultural lands at approximately 5.0 acres for Granite Falls Route 3. Approximately 94.8 percent of the soils impacted would be prime farmland or farmland of statewide importance. The Applicants estimate that approximately 204 acres of agricultural land will be impacted temporarily by Granite Falls Route 3 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 7.0 acres.

The route alignment crosses two center-pivot irrigation systems. The Applicants will work with landowners to minimize impacts to farming and avoid center-pivot irrigated areas whenever possible.

Routes 1 and 3

The Applicants estimate permanent impacts to agricultural lands at approximately 7.6 acres for Granite Falls Routes 1 and 3. Approximately 95 percent of the soils impacted would be prime farmland or farmland of statewide importance. The Applicants estimate that approximately 311 acres of agricultural land will be impacted temporarily by Granite Falls Routes 1 and 3 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 8.0 acres.

Forestry

No economically important forest resources are located along the proposed route alignment. Construction staging areas will be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. Unless otherwise agreed upon by the landowner, all storage and construction buildings, including concrete footings and slabs, and all construction materials and debris will be removed from the site once construction is complete. The area will be regraded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion.

Impacts along Granite Falls Route 1 to shelterbelts is estimated at 5.1 acres. Impacts along Granite Falls Route 3 to shelterbelts is estimated at 6.6 acres.

Clearing for the access road will be limited to only those trees necessary to permit the passage of equipment. Native shrubs that will not interfere with the safe operation of the transmission line will be allowed to reestablish in the ROW.

Tourism

No impacts to area tourism are anticipated from the presence of the transmission line for any of the Routes, and no mitigation is necessary.

Mining

Based on a review of existing information, Granite Falls Routes 1 and 3 would not impact active mining or quarrying operations. No mitigation is necessary.

8.1.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Route 1

No previously-identified archaeological resources have been recorded within 500 feet of Granite Falls Corridor Route 1.

No previously inventoried standing structures have been recorded within one mile of Granite Falls Corridor Route 1.

Route 3

No previously recorded archaeological resources have been identified within 500 feet. of Granite Falls Corridor Route 3.

Twenty-six previously inventoried standing structures have been recorded within one mile of Granite Falls Corridor Route 3 (Appendix L.2). Historic standing structures include bridges, schools, residences, commercial buildings, churches, community buildings, a creamery and the Battle Creek Post. Construction dates range from the 1880s to the 1940s. One structure, bridge L07845 (LP-MEH-004) in Lac Qui Parle County, is considered eligible for listing on the NRHP.

Many of the previously inventoried standing structures are within urban areas. Eighteen structures are within Marietta and four are within Rosen, Minnesota. The NRHP eligibility of these structures is currently unknown.

Routes 1 and 3

Two previously-identified archaeological resources, earthworks reported by Winchell (Sites 21CP000a and 21CP0011), are within 500 feet of Granite Falls Corridor Routes 1 and 3 and are listed in Appendix L.1.

In addition, 103 previously inventoried standing structures have been recorded within one mile of Granite Falls Corridor Routes 1 and 3 (Appendix L.2). Historic standing structures include active and abandoned farmstead complexes, schools, industrial structures, churches, bridges, commercial buildings, residences, other community buildings, and parks. Construction dates of inventoried historic structures generally range from the 1870s to 1970.

Many of these structures are in residential centers. Eighty-six structures are in Granite Falls, including the NRHP-eligible Pillsbury House (CP-GRN-005) and the NRHP-listed Andrew J. Volstead House (YM-GRN-016) and the Weaver House (CP-GRN-011). Ten structures are in Hazel Run.

The 1858 to 1880s PLS maps show archaeological and historic features, identified during the 19th-century government survey. Archaeological and historic features in the corridor include railroad alignments trails/roads, farms/structures, miscellaneous features and the boundaries of the Upper Sioux Reservation.

8.1.4.1 Impacts and Mitigation: Archaeological and Historic Resources

See Section 6.1.4.3 for potential impacts and mitigation measures related to archaeological and historic resources along Granite Falls Routes 1 and 3.

8.1.5 NATURAL ENVIRONMENT

8.1.5.1 Air Quality

See Section 6.1.5.1 for a general discussion of air quality along Granite Falls Routes 1 and 3.

8.1.5.2 Water Quality

Route 1

Granite Falls Route 1 lies within the Lac Qui Parle watershed of the Minnesota River Basin (MPCA 2005). Surface water flows generally north and east toward the Minnesota River along the route alignment. Surface water resources along the route alignment include Monighan Creek, the West Fork of the Lac Qui Parle River, and tributaries to Lac Qui Parle River and Cobb Creek. Streams along the route alignment have generally been left in their natural, meandering condition.

Individual Public Waters (stream and ditch crossings) are listed in Table 49. Public waters are defined in Section 13.0.

TABLE 49
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-15A	West Fork Lac Qui Parle River Unnamed Tributary to Cobb Creek (Section 3, Florida Township)

Source: DNR 2004. Public Water Inventory Maps

The route alignment will cross three wetlands identified by the NWI, two of which are palustrine emergent type (FWS 2005, National Wetland Inventory). None of the wetlands are listed as Public Waters. Some of these wetlands may be hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act. The number and type of NWI wetlands crossed by the proposed route alignment are shown in Table 50. Both the PWI and NWI information related to the proposed route alignment is identified on the maps in Appendix H.

TABLE 50
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland
G-14	2 palustrine emergent, 1 palustrine forested

There are no MPCA-listed impaired waters along the route.

Route 3

Granite Falls Route 3 lies within the Lac Qui Parle watershed of the Minnesota River Basin (MPCA 2005). Surface water flows generally north and east toward the Minnesota River along the route alignment. Surface water resources along the route alignment include Crow Creek, Lost Creek, the West Fork of the Lac Qui Parle River, the Yellow Bank River, and tributaries to Lac Qui Parle River. Streams along the route alignment have generally been left in their natural, meandering condition.

Along Granite Falls Route 3, the South Fork of the Yellow Bank River is listed on the NRI for its scenic, recreational, geologic, fishery, wildlife, historic and cultural values.

Individual Public Waters (stream and ditch crossings) are listed in Table 51. Public waters are defined in Section 13.0.

TABLE 51
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-63	Yellow Bank River Unnamed Tributary to Yellow Bank River South Fork Yellow Bank River (2 crossings) Unnamed Tributary to Lac Qui Parle River
G-65	Unnamed Tributary to Lac Qui Parle River Unnamed Tributary to Lac Qui Parle River
G-67	Unnamed Tributary to Lac Qui Parle River
G-69	Unnamed Tributary to Lost Creek Lost Creek
G-70	West Fork Lac Qui Parle River Unnamed Tributary to PWI 212 W Unnamed Tributary to Cobb Creek (2 crossings) Unnamed Tributary to Cobb Creek Unnamed Tributary to Cobb Creek

Source: DNR 2004. Public Water Inventory Maps

Along the proposed route alignment the transmission line will cross sixteen wetlands identified by the NWI, eleven of which are palustrine emergent type (FWS 2005, National Wetland Inventory). None of the wetlands are listed as Public Waters. Some of these wetlands may be hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act. The number and type of NWI wetlands crossed by the proposed route alignment are shown in Table 52. Both the PWI and NWI information related to the proposed route alignment is identified on the maps in Appendix H.

TABLE 52
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland
G-59	2 palustrine emergent
G-61	No wetland crossings
G-63	2 palustrine emergent, 4 palustrine forested
G-65	1 palustrine emergent, 1 palustrine forested
G-67	No wetland crossings
G-69	2 palustrine emergent
G-70	4 palustrine emergent

There are no MPCA-listed impaired waters along the route.

Routes 1 and 3

Granite Falls Routes 1 and 3 lie within the Minnesota River (Granite Falls) and Lac Qui Parle watersheds of the Minnesota River Basin (MPCA 2005). Surface water flows generally north and east toward the Minnesota River along the route alignment. Surface water resources along the route alignment include the Minnesota River, Lac Qui Parle River, Florida Creek, Canby Creek, Spring Creek and tributaries to those waters.

Along Granite Falls Routes 1 and 3, the Minnesota River is listed on the NRI for its scenic, recreational, wildlife, and historic values (NPS 2005).

Individual Public Waters (stream and ditch crossings) are listed in Table 53. Public waters are defined in Section 13.0.

TABLE 53
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-17	Unnamed Tributary to Florida Creek
G-21	Florida Creek Unnamed Tributary to Judicial Ditch #1
G-30	Unnamed Tributary to Judicial Ditch #1
G-31	Unnamed Tributary to Canby Creek Canby Creek
G-39	Lac Qui Parle River Unnamed Tributary to Spring Creek Unnamed Tributary to Spring Creek Unnamed Tributary to Spring Creek (2 crossings)
G-45	Spring Creek Unnamed Tributary to Hazel Creek (3 crossings)
G-50	Hazel Creek County Ditch #6 County Ditch #39
G-53	Minnesota River

Source: DNR 2004. Public Water Inventory Maps

Along the proposed route alignment the transmission line will cross 25 wetlands identified by the NWI, 21 of which are palustrine emergent type (FWS 2005, National Wetland Inventory). One of the wetlands along the Segment G-45 alignment is a Public Water (Lanners Lake). Some of these wetlands may be hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the WCA. The number and type of NWI wetlands crossed by the proposed route alignment are shown in Table 54. Both the PWI and NWI information related to the proposed route alignment is identified on the maps in Appendix H.

TABLE 54
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland
G-17	No wetland crossings
G-21	No wetland crossings
G-30	1 palustrine unconsolidated bottom
G-31	1 palustrine emergent
G-32	No wetland crossings
G-39	1 palustrine emergent
G-45	7 palustrine emergent
G-49	No wetland crossings
G-50	9 palustrine emergent, 2 palustrine unconsolidated bottom
G-53	3 palustrine emergent, 1 riverine

The MPCA lists the Lac Qui Parle River as being impaired for mercury, fecal coliform and low oxygen. The Minnesota River is impaired for mercury and fecal coliform (MPCA 2004).

8.1.5.3 Flora

Route 1

Granite Falls Route 1 is located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation that may be found in scattered prairie remnants within this ecoregion, as well as the common agricultural products found in cultivated areas.

The GAP land cover types along the route alignment are shown in Table 55. The GAP land cover data shows that approximately 98 percent of the land along the proposed route alignment is in agricultural uses. Appendix I.1 lists the specific GAP categories within the general cover types shown below.

TABLE 55
GAP LAND COVER – GRANITE FALLS ROUTE 1

Cover Type	Area (acres)	Percent of Route
Agriculture	1,227	97.6
Wetland/Riparian/Open Water	12	1.0
Forest	18	1.4
Shrubland	0	0.0
Prairie	0	0.0
Developed	0	0.0

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data.

There are no WMAs within the route. There is one DNR-listed native mesic prairie community along Segment G-14. Within one mile of the proposed route alignment, there are seven additional natural communities listed by the DNR: all dry hill prairie communities (Minnesota Natural Heritage and Nongame Wildlife Program 2005).

Along the route, there are approximately 38 acres of FWS grassland easements and 57 acres of FWS wetland easements. DNR data describing railroad prairies were also analyzed for the route. Results of the analysis are presented in Section 8.1.6.

Route 3

Granite Falls Route 3 is located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation that may be found in scattered prairie remnants within this ecoregion, as well as the common agricultural products found in cultivated areas.

The GAP land cover types along the route are shown in Table 56. The GAP land cover data shows that approximately 98 percent of the land along the proposed route alignment is in agricultural uses. Appendix I.1 lists the specific GAP categories within the general cover types shown below.

TABLE 56
GAP LAND COVER – GRANITE FALLS ROUTE 3

Cover Type	Area (acres)	Percent of Route
Agriculture	7,648	97.5
Wetland/Riparian/Open Water	155	2.0
Forest	39	0.5
Shrubland	0	0.0
Prairie	0	0.0
Developed	0	0.0

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data.

Along the route, there are several areas where natural vegetation is being managed. Walter WMA contains grassland and marsh vegetation. Indigo WMA is predominantly grassland, with some cultivated land interspersed, and Plantation WMA is predominantly grassland with an open water lake (DNR 2005). The route alignment does not cross any of the WMAs

Along the route, there are approximately 171 acres of FWS wetland easements.

There are no DNR-listed native plant communities within the route. Within one mile of the proposed route alignment, there are 11 natural communities listed by the DNR: four mesic prairies, four wet prairies and three dry hill prairie communities (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Appendix M.1 lists the plant species found within these natural communities. DNR data describing railroad prairies was also analyzed for the route. Results are presented in Section 8.1.6.

Routes 1 and 3

Granite Falls Routes 3 and 4 are located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation that may be found in scattered prairie remnants within this ecoregion, as well as the common agricultural products found in cultivated areas.

The GAP land cover types along the route are shown in Table 57. The GAP land cover data shows that approximately 98 percent of the land along the proposed route alignment is in agricultural uses. Appendix I.1 lists the specific GAP categories within the general cover types shown below.

TABLE 57
GAP LAND COVER – GRANITE FALLS ROUTES 1 AND 3

Cover Type	Area (acres)	Percent of Route
Agriculture	12,943	97.6
Wetland/Riparian/Open Water	180	1.5
Forest	43	0.3
Shrubland	32	0.3
Prairie	0	0.0
Developed	34	0.3

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data.

Along the route, there are several areas where natural vegetation is being managed. Lanners and Omro WMAs have wetland and grassland vegetation (DNR 2005). The route alignment crosses Lanners WMA for more than 1,000 feet. There are no FWS easements along the route alignment.

There are six DNR-listed native plant communities within the route: one dry prairie community and four rock outcrop communities along the Segment G-50 alignment, and one dry prairie community along the Segment G-53 alignment. Within one mile of the proposed route alignment, there are 34 additional natural communities listed by the DNR (Minnesota Natural Heritage and Nongame Wildlife Program 2005). Appendix M.1 lists the plant species found in this natural communities. DNR data describing railroad prairies was also analyzed for the route. Results of the analysis are presented in Section 8.1.6.

8.1.5.4 Fauna

Routes 1 and 3

Although most of the land adjacent to the proposed route alignment is cultivated, there are several WMAs and WPAs in the Project area that provide habitat for a variety of animal species. The WMAs are managed by the DNR for wildlife production, with primary game species consisting of waterfowl, pheasants, and white-tailed deer. Section 6.1.5.4 lists common wildlife species found in the project vicinity.

Most of the route is adjacent to cultivated land, which provides some cover for the common fauna known to inhabit Minnesota. A discussion of common wildlife and avian resources is given in Section 6.1.5.4, and a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

Along Granite Falls Route 1, the Segment G-14 and G-15A alignments pass through areas designated by the FWS and DNR joint assessment as having both important grassland and wetland habitats for waterfowl. Along Granite Falls Route 3, the Segment G-61, G-63, G-69 and G-70 alignments cross high priority areas. Along Granite Falls Routes 1 and 3, the Segment G-21, G-45, G-50 and G-53 alignments cross high priority areas (FWS and DNR 2005). The high priority areas listed in the FWS and DNR joint assessment are identified in Appendix K.5. See Section 6.1.5.4 for a discussion of the joint assessment.

There are two mussel sampling sites in the Minnesota River within one mile of Segments G-50 and G-53, along Granite Falls Routes 1 and 3 (Minnesota Natural Heritage and Nongame Wildlife Program 2005).

8.1.5.5 Impacts and Mitigation: Natural Environment

Air Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to air quality along Granite Falls Routes 1 and 3.

Water Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to water quality along Granite Falls Routes 1 and 3. No permanent impacts to wetlands are anticipated for Granite Falls Route 1 or Route 3. For Granite Falls Routes 1 and 3, permanent impacts along the Segment 45 alignment will likely occur because the route alignment crosses two wetlands that are wider than 1,000 feet. One of the wetlands is a DNR PWI, Lanners Lake, located in Lanners WMA. Use of H-frame structures will allow for a longer span, 1,000 feet, than the single steel structures. It is anticipated that a maximum of one structure may be placed in each of these wetlands, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact and 25,000 square feet (0.57 acres) of temporary impact per wetland. The Applicants will obtain utility crossing permits from the DNR for any PWI water crossed.

Flora

As stated in Section 6.1.5.5, native vegetation is anticipated to be minimal and impacts to WPAs and Federally-funded WMAs may require a compatibility analysis.

Route 1

The remnant prairie community along the Route will be spanned, as feasible, and no permanent impacts will occur.

The Applicants estimate that an approximately 0.7-acre easement within FWS grassland easements will be necessary.

Route 3

The Applicants propose to avoid Plantation and Walter WMAs by skirting their western edges. However, the Applicants estimate that a 3.7-acre easement in Plantation WMA will be necessary. No easements within FWS easements are anticipated.

The Applicants will attempt to avoid placing structures in the surveyed remnant prairie community along Segment G-61 by placing the route along the northern edge of the community.

Routes 1 and 3

The Applicants intend to and will work diligently to avoid any direct impacts to WMAs along the route. It should not be necessary to place structures in Omro WMA because the transmission line can be routed to pass north of the northern edge of the resource. However, an approximately 0.3-acre easement within Omro WMA is anticipated. Lanners WMA is wider than 1,000 feet where the route alignment crosses; it is therefore likely that structures will be placed in the WMA. The number of structures within the WPA will be minimized by maximizing the span length or replacing structure for structure, as practical. Because the proposed route alignment is a rebuild of an existing transmission line, the structures will be placed in an existing transmission corridor, and where feasible, structure for structure replacement will occur and will not impact previously undisturbed vegetation. An approximately 6.8-acre easement within Lanners WMA is anticipated. No easements within FWS easements are anticipated.

The Applicants will attempt to avoid placing structures in the surveyed remnant prairie communities along the route. However, since one rock outcrop remnant along the Segment G-50 alignment is wider than 1,000 feet: it is likely that three structures will be placed in this community. The Applicants will attempt to avoid placing structures in rocky areas withing this community; the Applicants are considering construction options to avoid and minimize impacts to this area. None of the DNR-listed natural communities within the route are wider than the maximum span length; therefore no permanent impacts to these vegetative communities are expected to result.

The Applicants will continue to work with the DNR and FWS to minimize and avoid impacts to sensitive flora along the route alignment. The Applicants will survey the approved route for threatened and endangered species and will span any areas found to contain rare species. When native vegetation communities cannot feasibly be spanned, the Applicants will minimize the number of structures within these lands and will survey the approved route for threatened and endangered species within the ROW of the approved route. 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.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

As stated in Section 6.1.5.5, there is minimal potential for the displacement of wildlife and loss of habitat from construction of the Granite Falls routes.

Similar to the other routes, avian collisions are a possibility after construction. Along Granite Falls Route 1, the Segment G-14 and G-15A alignments pass through areas designated by the FWS and DNR joint assessment as having both important grassland and wetland habitats for waterfowl. Along Granite Falls Route 3, the Segment G-61, G-63, G-69 and G-70 alignments cross high priority areas. Along Granite Falls Routes 1 and 3, the Segment G-21, G-45, G-50 and G-53 alignments cross high priority areas. 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 Applicants will work with the FWS and DNR to minimize impacts along these segments as necessary.

See Section 6.1.5.5 for potential impacts and mitigation measures related to fauna along Granite Falls Routes 1 and 3.

8.1.6 RARE AND UNIQUE NATURAL RESOURCES

8.1.6.1 Route 1

Table 58 lists the rare or unique resources identified within one mile of Granite Falls Route 1. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Granite Falls Route 1 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 58
RARE AND UNIQUE RESOURCES – GRANITE FALLS ROUTE 1

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Low Milk-vetch	4	*Astragalus lotiflorus*	Not Listed	NON	SNR	Tallgrass prairie
White Prairie-clover	1	*Dalea candida var. oligophylla*	Not Listed	SPC	S3	Mesic prairie
Dry Prairie (Southwest) Hill Subtype	7		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	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.

There are no areas listed by the DNR MCBS as having medium, high or outstanding biodiversity significance along the proposed route. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Granite Falls Route 1. There are no DNR-listed railroad prairies along the route.

An initial survey conducted in June 2005 identified one remnant dry prairie community along the Segment G-15A alignment (GES 2005).

8.1.6.2 Route 3

Table 59 lists the rare or unique resources identified within one mile of Granite Falls Route 3. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Granite Falls Route 3 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 59
RARE AND UNIQUE RESOURCES – GRANITE FALLS ROUTE 3

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Low Milk-vetch	4	*Astragalus lotiflorus*	Not Listed	NON	NR	Tallgrass prairie
Missouri Milk-vetch	3	*Astragalus missouriensis*	Not Listed	SPC	S3	Dry, gravelly prairie slopes, often in open soil
Upland Sandpiper	2	*Bartramia longicauda*	Not Listed	NON	S4	Dry prairies
Cutleaf Ironplant	2	*Haplopappus spinulosus*	Not Listed	SPC	S3	Excessively-drained hillsides)often river bluffs, kames, eskers or morainic ridges), in gravelly or sandy soils
Pawnee Skipper	1	*Hesperia leonardus pawnee*	Not Listed	SPC	S3	Undisturbed, sandy prairies on Liatris blooms
Loggerhead Shrike	1	*Lanius ludovicianus*	Not Listed	THR	S2	Open country and dry upland prairie where hedgerows, shrubs and small trees occur
Prairie Vole	1	*Microtus ochrogaster*	Not Listed	SPC	S3	Dry, upland prairies
Northern Grasshopper Mouse	1	*Onychomys leucogaster*	Not Listed	NON	NR	Sandy dry hill prairies
Regal Fritillary	2	*Speyeria idalia*	Not Listed	SPC	S3	Large grassland areas or lightly grazed pasture lands with prairie remnants larval plants are violets.
Yellow Prairie Violet	2	*Viola nuttallii*	Not Listed	THR	S2	Loose, barren soil on gravelly kame and morainic formations
Dry Prairie (Southwest) Hill Subtype	3		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	4		Not Listed	None	S2	
Wet Prairie (Southwest) Subtype	4		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

There are no areas listed by the DNR MCBS as having medium, high or outstanding biodiversity significance along the proposed route. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Granite Falls Route 3. There are no DNR-listed railroad prairies along the route.

An initial survey conducted in October 2005 identified one remnant dry prairie community along the Segment G-61 alignment (GES 2005).

8.1.6.3 Routes 1 and 3

Table 60 lists the rare or unique resources identified within one mile of Granite Falls Routes 1 and 3. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Granite Falls Routes 1 and 3 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 60
RARE AND UNIQUE RESOURCES – GRANITE FALLS ROUTES 1 AND 3

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Mucket mussel	1	Actinonaias ligamentina	Not Listed	THR	S2	Medium to large rivers in sand and gravel
Elktoe mussel	2	Alasmidonta marginata	Not Listed	THR	S2	Medium to large rivers in sand and gravel
Sullivant's Milkweed	1	Asclepias sullivantii	Not Listed	THR	S2	Mesic, tallgrass prairie
Low Milk-vetch	2	Astragalus lotiflorus	Not Listed	NON	NR	Tallgrass prairie
Missouri Milk-vetch	2	Astragalus missouriensis	Not Listed	SPC	S3	Dry, gravelly prairie slopes, often in open soil
A Species of Lichen	1	Buellia nigra	Not Listed	END	S1	Exposed rocks near hardwood forests
Eastern Fox Snake	4	Elaphe vulpina	Not Listed	NON	S4	Woods, old fields, and dune areas
Spike mussel	2	Elliptio dilatata	Not Listed	SPC	S3	Small to large streams, occasionally lakes, in mud or gravel
Five-lined Skink	2	Eumeces fasciatus	Not Listed	SPC	S3	Granite rock outcrops
Mussel Sampling Site	2	Freshwater Mussel Concentration Area	Not Listed	None	NR	
Bald Eagle	1	Haliaeetus leucocephalus	THR	SPC	S3	Forested areas near lakes and rivers
Fluted-shell	2	Lasmigona costata	Not Listed	SPC	S3	Medium to large rivers in sand and gravel
Black Sandshell	2	Ligumia recta	Not Listed	SPC	S3	Medium to large rivers in riffles or raceways in mud and sand
Plains Prickly Pear	1	Opuntia macrorhiza	Not Listed	SPC	S3	Rocky/sandy soil in grasslands
Salamander Mussel	1	Simpsonaias ambigua	Not Listed	THR	S2	Medium to large rivers in mud and gravel, or under flat slabs of rock

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Dry Prairie (Southwest) Hill Subtype	9		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	4		Not Listed	None	S2	
Rock Outcrop-Dry Prairie Complex	3		Not Listed	None	S2	
Rock Outcrop (Southwest) Subtype	24		Not Listed	None	NR	

** 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.

There are no areas listed by the DNR MCBS as having medium, high or outstanding biodiversity significance along the proposed route. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Granite Falls Routes 1 and 3. There are no DNR-listed railroad prairies along the route.

An initial survey conducted in June 2005 showed that the route alignment crosses six remnant prairie communities: two mesic prairie communities, one rock outcrop community and one dry prairie community along the Segment G-50 alignment, and one dry prairie community and one rock outcrop community along the Segment G-53 alignment. (GES 2005)

8.1.6.4 Impacts and Mitigation: Rare and Unique Natural Resources

Route 1

A search of the DNR's Minnesota Natural Heritage Database identified one species of special concern within one mile of the proposed route alignment. Eight DNR listed natural communities are within one mile of the proposed route alignment. No impacts to the natural communities or special status species are expected.

Route 3

A search of the DNR's Minnesota Natural Heritage Database identified one instance of a State threatened species (the loggerhead shrike) and five species of special concern within one mile of the proposed route alignment. Most of the instances identified by the Natural Heritage Database occur within the DNR's WMAs along the route alignment. Eleven DNR listed natural communities are within one mile of the proposed route alignment. No impacts to the natural communities are expected to result. Shelterbelts and hedgerows will be conserved as possible. However, 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. In the event shelterbelts and hedgerows for a known Loggerhead Shrike population must be affected, the Applicants will work with the DNR on appropriate mitigation.

The majority of the listed special concern species is associated with prairies and could be impacted by placement of structures in these habitats. The Applicants will attempt to span prairie remnants whenever possible. Whenever it is not feasible to span, a survey will be conducted to determine the presence of special status species and coordination will occur with the appropriate agencies to avoid and minimize any impact.

Routes 1 and 3

A search of the DNR's Minnesota Natural Heritage Database identified one instance of a Federal threatened State special concern species (bald eagle), one State endangered species (the lichen *Buellin nigra*), four instances of State threatened species (mucket mussel, elktoe mussel, salamander mussel and Sullivant's milkweed) and six species of special concern within one mile of the proposed route alignment. Many of the instances identified by the Natural Heritage Database occur within the DNR's WMAs along the route alignment and near the Minnesota River. Forty DNR listed natural communities are within one mile of the proposed route alignment. No impacts to the natural communities are expected to result. 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.

The Applicants will attempt to span any habitats where native prairie fragments or other unique plant communities have been recorded or could occur. A survey for special status species will be conducted once a route alignment is approved.

Bald eagles are most adversely affected by human activities during the breeding and nesting seasons. The DNR has developed seasonal timeframes delineating eagles' critical development periods. February 10th to May 1st is the most critical segment when eagles are involved with courtship, egg-laying and incubation. Construction noise and activity during critical development periods of bald eagles may cause nest abandonment, premature fledging of young birds, increased stress at a winter roost site and loss of habitat for nesting and roosting. Areas with known active nests will be avoided, as practical, during critical periods. Construction will be restricted within a quarter mile of an active nest during critical development periods. The documented nest is located approximately 0.24 miles from the route alignment. If an active nest is located along the route, the Applicants will work with the FWS and DNR to determine appropriate minimization and mitigation procedures.

The lichen Buellia nigra, a State endangered species, occurs in rock outcrops. Due to the difficulty of constructing in rock outcrops, and the sensitive nature of the plant communities within these areas, the Applicants are considering construction options in the rock outcrops areas near Granite Falls. If construction within outcrops cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

The mucket mussel, elktoe mussel and salamander mussel, State threatened species and other special status mussels occur in rivers such as the Minnesota River. The Applicants will avoid impacting these species by spanning the Minnesota River.

Sullivant's milkweed, as well as the majority of the listed special concern species, are associated with prairies and could be impacted by placement of structures in these habitats. The Applicants will attempt to span prairie remnants whenever possible. Whenever it is not feasible to span, a survey will be conducted to determine the presence of special status species and coordination will occur with the appropriate agencies to avoid and minimize any impact.

8.2 ROUTES 2 AND 4

8.2.1 DESCRIPTION OF ENVIRONMENTAL SETTING

The environmental setting for Granite Falls Routes 2 and 4 is essentially the same as that for Granite Falls Routes 1 and 3 (Section 8.1.1).

8.2.2 HUMAN SETTLEMENT

8.2.2.1 Public Health and Safety

See Section 6.1.2.1 for a general discussion of public health and safety along Granite Falls Routes 2 and 4.

One issue associated with high-voltage transmission lines is the proximity of those lines to airport facilities. Two airports are located in the vicinity of Granite Falls Routes 1 and 3. The Granite Falls Airport is located near segment G-53 but is outside of any ordinance zones. The route would be within the 10,000-foot buffer in the future. The Canby Airport is located near segments G-29, G-30, G-31, and G-33. All of these segments would be affected by Airspace Obstruction Zoning and the portion of these segments located within Sections 21, 22, and 25, Township 115 North, Range 45 West would also be affected by Land Use Safety Zoning.

8.2.2.2 Commercial, Industrial and Residential Land Use

Route 2

Zoning information was obtained for the counties and cities along Granite Falls Route 2 (Appendices I.6 and I.7) which includes Lac Qui Parle and Yellow Medicine counties.

Table 61 shows that nearly 98 percent of the land in Granite Falls Route 2 is agricultural. Segment G-16 contributes to the majority of the cropland. Appendix I.1 defines the land use types identified in Table 61. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 61
GAP LAND USE DATA FOR GRANITE FALLS ROUTE 2

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agricultural	1860.86	97.93
Wetland/Riparian/Open Water	6.88	0.36
Forest	32.42	1.71
Shrubland	0.0	0.0
Prairie	0.0	0.0
Developed	0.0	0.0
Total	1900.16	100.0

Lac Qui Parle

A small portion of the route alignment crosses agricultural land in Lac Qui Parle County; transmission lines are a permitted use according to the county zoning ordinance (Appendix I.6).

No schools, permitted daycare facilities, churches, cemeteries, or airports were identified in Granite Falls Route 2.

Yellow Medicine

The Granite Falls Route 2 alignment primarily crosses agricultural land in Yellow Medicine County (zoning maps can be found in Appendix I.7).

No schools, permitted daycare facilities, churches, cemeteries, or airports were identified in Granite Falls Route 2.

Route 4

Zoning information was obtained for the counties and cities along Granite Falls Route 4 (Appendix I.6 and Appendix I.7) which includes Lac Qui Parle and Yellow Medicine counties. There are no communities within one mile of the route alignment.

Table 62 shows, 98 percent of the land in Granite Falls Route 4 is agriclutrual. Segments G-54, G-55, and G-58 contribute to the majority of the cropland. Appendix I.1 defines the land use types identified in Table 62. Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 62
GAP LAND USE DATA FOR GRANITE FALLS ROUTE 4

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agricultural	8006.41	98.23
Wetland/Riparian/Open Water	84.56	1.04
Forest	59.31	0.73
Shrubland	0.0	0.0
Prairie	0.0	0.0
Developed	0.0	0.0
Total	0.0	0.0

Lac Qui Parle

The route primarily crosses area zoned for agriculture; transmission lines are permitted uses within this zoning district. There are several intermittent and perennial streams and drainage areas.

No schools, registered daycare facilities, churches, or airports were identified along Route 4. One cemetery, Trinity Cemetery (Walter Township) was identified adjacent to Route 4.

Yellow Medicine

A very small portion of the route alignment crosses into agricultural land in Yellow Medicine County. No schools, permitted daycare facilities, churches, cemeteries, or airports were identified in Granite Falls Route 4.

Routes 2 and 4

Zoning information was obtained for the counties and cities along Granite Falls Routes 2 and 4 (Appendices I.6 and I.7) which includes Lac Qui Parle and Yellow Medicine counties. There are four communities within one mile of the route alignment: Canby, St. Leo, Minnesota, Hazel Run and Granite Falls.

Table 63 shows, 97 percent of the land in Granite Falls Routes 2 and 4 is agricultural. Segments G-42, G-44, G-48, G-51, G-32, G-39, G-45 and G-50 contribute to the majority of the cropland. Appendix I.1 defines the land use types identified in Table 63. Appendix K.1 is an overview of the Gap Land Uses along the route.Appendix K.1 is an overview of the Gap Land Uses along the route.

TABLE 63
LAND USE DATA FOR GRANITE FALLS ROUTES 2 AND 4

Land Use Types	TOTAL	
	Area (acres)	Percent of Route
Agricultural	11931.41	97.39
Wetland/Riparian/Open Water	161.63	1.32
Forest	105.89	0.86
Shrubland	52.65	0.43
Prairie	0.0	0.0
Developed	0.0	0.0
Total	12251.58	100.0

Yellow Medicine County

The majority of the land crossed by Granite Falls Routes 2 & 4 is zoned agricultural; certain isolated areas would be riparian, and potentially subject to shoreland zoning ordinances. Zoning maps are included in Appendix I.7).

There are two public schools near the alignment of Granite Falls Routes 2 and 4 in Yellow Medicine County; Bert Raney Elementary School and Granite Falls Senior High School, both in Granite Falls. These schools both appear to be east of the alignment. Minnesota West Community and Technical College, a two-year college, is also located in Granite Falls; it is also east of alignment. There are two registered child care providers east of the alignment of Granite Falls Routes 2 & 4 in Yellow Medicine County (Granite Falls Head Start and Prairie Land Daycare/Head Start). There are nine churches within Granite Falls east of the alignment: Assembly of God Church, First Baptist Church, Open Door Baptist Church, St. Andrew Catholic Church, Grace Evangelical Free Church, Bergen Lutheran Church, Granite Falls Lutheran Church, St. Paul's Lutheran Church and Granite Falls United Church.

There are three cemeteries near the alignment of Granite Falls Routes 2 and 4 in Yellow Medicine County: St. Paul's Cemetery (immediately west of Granite Falls), Bethlehem Cemetery (Hammer Township), and Nicolai Cemetery (Oshkosh Township).

Neither the Canby airport nor the Granite Falls Municipal airports would be impacted by Granite Falls Routes 2 and 4.

Lac Qui Parle County

A very small portion of Granite Falls Routes 2 and 4 crosses land in Yellow Medicine County; this land is primarily zoned agricultural. Transmission lines are a permitted use in this zoning district according to the county zoning ordinance (Appendix I.6)

No schools, permitted daycare facilities, churches, cemeteries, or airports were identified in Granite Falls Route 4.

8.2.2.3 Displacement

See Appendix O for a breakdown of the number of homes along the route alignment.

Route 2

There are no homes on Granite Falls Route 2 located within 100 feet of the route alignment. There are no homes along Granite Falls Route 2 that are within 300 feet but greater than 100 feet from the route alignment.

Route 4

There are no homes on Granite Falls Route 4 located within 100 feet of the route alignment. There are 2 homes along Granite Falls Route 4 that are within 300 feet but greater than 100 feet from the route alignment.

Routes 2 and 4

There is 1 home on Granite Falls Routes 2 and 4 located within 100 feet of the route alignment. There are 13 homes along Granite Falls Route 4 that are within 300 feet but greater than 100 feet from the route alignment.

8.2.2.4 Noise

See Section 6.1.2.4 for a general discussion of noise along Granite Falls Routes 2 and 4.

8.2.2.5 Aesthetics

Route 2

The aesthetic setting of Granite Falls Route 2 would be essentially the same as for Granite Falls Route 1, exception that only one home was identified within 500 feet of the route alignment.

Route 4

The aesthetic setting of Granite Falls Route 4 would be essentially the same as for Granite Falls Route 3, except Granite Falls Route 4 does not come within one mile of any towns. Similar to Granite Falls Route 3, a total of three homes were identified within 500 feet of the route alignment.

Routes 2 and 4

The aesthetic setting of Granite Falls Routes 2 and 4 is essentially the same as that of Granite Falls Routes 1 and 3, except that 26 homes were identified within 500 feet of the route alignment.

8.2.2.6 Socioeconomic

Route 2

Granite Falls Route 2 is located in Lac Qui Parle and Yellow Medicine counties. Table 42 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Granite Falls Route 2. As can be seen in Table 42 in Section 8.1.2.6, Granite Falls Route 2 does not contain populations of disproportionately high minority populations or low-income populations.

Table 45 in Section 8.1.2.6 identifies the top three leading industries in each county along Granite Falls Route 2.

Route 4

Granite Falls Route 4 is located in Lac Qui Parle and Yellow Medicine counties. Table 44 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Granite Falls Route 4. As can be seen in Table 42 in Section 8.1.2.6, Granite Falls Route 4 does not contain populations of disproportionately high minority populations or low-income populations.

Table 45 in Section 8.1.2.6 identifies the top three leading industries in each county along Granite Falls Route 4.

Routes 2 and 4

Granite Falls Routes 2 and 4 is located in Lac Qui Parle and Yellow Medicine counties. Table 46 lists the specific U.S. Census block groups that the route alignment crosses and Appendix K.2 shows the locations of the block groups. Due to the rural nature of the project area, the block groups are significantly larger than the actual area encompassed by Granite Falls Routes 2 and 4. As can be seen in Table 42 in Section 8.1.2.6, Granite Falls Routes 2 and 4 does not contain populations of disproportionately high minority populations or low-income populations.

Table 45 in Section 8.1.2.6 identifies the top three leading industries in each county along Granite Falls Routes 2 and 4.

8.2.2.7 Cultural Values

See Section 7.1.2.7 for a general discussion of cultural value resources along Granite Falls Routes 2and 4.

8.2.2.8 Recreation

There are a variety of outdoor recreational opportunities along the routes, including snowmobiling, biking, hiking, canoeing, boating, fishing, camping, swimming, hunting and nature observation. Appendix K.3 shows the locations of WMAs within the vicinity of the routes. The detailed route maps in Appendix H identify the WMAs in more detail.

Route 2

There are no WMAs located within the route. Mound Springs WMA is within one mile of Segment G-16. There are no WPAs within one mile of the route alignment. The route alignment does not cross any snowmobile trails.

Route 4

Walter WMA is located within the route. There are five WMAs located within one mile of the route alignment: Quilitz, Gollnick, NE Four Corners, Florida and Sweetwater. There are no WPAs within the route; within one mile there are four unnamed WPAs. The route alignment does not cross any snowmobile trails.

Routes 2 and 4

Omro WMA is located within Granite Falls Routes 2 and 4. Within one mile of the route alignment, there are four additional WMAs: Big Rock, Oshkosh, Myhre, and Lanners. The Minnesota River is designated as a Wild and Scenic River from the Lac Qui Parle Dam to Franklin, which includes Granite Falls. The Minnesota River Valley National Scenic Byway runs through Granite Falls on U.S. Highway 212 and County Road 67. The route alignment crosses one snowmobile trail in Segment G-51.

8.2.2.9 Public Services

Granite Falls Routes 2 and 4 includes Lac Qui Parle and Yellow Medicine counties. This is a rural area with very few public services. There are four communities within one mile of the route alignment: Canby, St. Leo, Hazel Run, and Granite Falls. Granite Falls is the primary community 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. For a discussion of potential airport conflicts see Section 6.1.2.2.

8.2.2.10 Impacts and Mitigation: Human Settlement

Public Health

The Applicants will ensure that safety requirements are met during the construction and operation of the facility. Additionally, when crossing roads or railroads during stringing operations, guard structures will be utilized to eliminate traffic delays and provide safeguards for the public.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the pole locations), impacts will be minimal and no mitigation is anticipated.

Coordination with local government representatives and citizens may be necessary as the route is finalized to minimize or avoid impacts to sensitive land uses, specifically the three cemeteries identified near the route alignment.

Displacement

No displacements are anticipated.

Noise

See Section 6.1.2.10 for potential impacts and mitigation related to noise along Granite Falls Routes 2 and 4.

Aesthetics

See Section 6.1.2.10 for potential impacts and mitigation related to aesthetics along Granite Falls Routes 2 and 4.

Socioeconomic

See Section 6.1.2.10 for potential impacts and mitigation related to socioeconomics along Granite Falls Routes 2 and 4.

Cultural Values

See Section 6.1.2.10 for potential impacts and mitigation measures related to cultural values along Granite Falls Routes 2 and 4.

Recreation

Route 2

The route alignment will likely be visible from Mound Springs WMA. No impacts to recreational resources are anticipated, and no mitigation is necessary.

Route 4

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants intend to and will work diligently to avoid any direct impacts to the WMA within the route. Walter WMA is located on both sides of the roadway; the Applicants will attempt to span the WMA on the western side of the roadway where the WMA is approximately 600 feet wide. The proposed transmission line will likely be visible from the WMAs and WPAs within one mile. The route will not interfere with the use of those recreational resources. An easement will still be required due to the proximity of the route alignment to Walter WMA. The Applicants estimate that approximately 2.1 acres of easements within Walter WMA will be necessary.

Routes 2 and 4

Direct impacts to area recreation will be minimized to the greatest extent feasible. The Applicants will avoid any direct impacts to the WMA within the route. The proposed transmission line will likely be visible from the WMAs and WPAs within one mile, the Minnesota River Valley Scenic Byway, and the Minnesota River. The route will not interfere with the use of those recreational resources. An easement will still be required due to the proximity of the route alignment to Omro WPA. The Applicants estimate that approximately 0.1 acres of easements within Omro WMA will be necessary.

Public Services

No impact is expected to public services along Granite Falls Routes 2 and 4.

8.2.3 LAND-BASED ECONOMICS

8.2.3.1 Agriculture

Route 2

Along Granite Falls Route 2, approximately 98 percent of the land is used for agriculture (USGS 2004), and approximately 92 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (USDA NRCS 2005).

Section 8.1.3.1 gives agricultural data for Yellow Medicine County.

There are no center pivot irrigation systems along the route alignment.

Route 4

Along Granite Falls Route 4, approximately 98 percent of the land is used for agriculture (USGS 2004), and approximately 95 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (USDA NRCS 2005).

Section 8.1.3.1 gives agricultural data for Lac Qui Parle County.

The route crosses six center pivot irrigation systems: three along the Segment G-57 alignment and three along the Segment G-58 alignment.

Routes 2 and 4

Along Granite Falls Routes 2 and 4, approximately 97 percent of the land is used for agriculture (USGS 2004), and approximately 94 percent of the soils are listed by the NRCS as prime farmland, prime when drained, or farmland of statewide importance (USDA NRCS 2005).

Section 8.1.3.1 gives agricultural data for Chippewa and Yellow Medicine counties.

There are no center pivot irrigation systems along the route alignment.

8.2.3.2 Forestry

Route 2

Granite Falls Route 2 is primarily grassland.

Route 4

Granite Falls Route 4 is primarily grassland.

Routes 2 and 4

Granite Falls Routes 2 and 4 are primarily grassland.

8.2.3.3 Tourism

Route 2

Mound Springs WMA is located within one mile of Segment G-16. Tourism along the proposed route alignment is likely limited to bird watching, hunting and fishing opportunities.

Route 4

Walter WMA is located along the route. There are five WMAs located within one mile of the proposed route alignment: Quilitz, Gollnick, NE Four Corners, Florida and Sweetwater. There are no WPAs along the route; within one mile there are four unnamed WPAs.

Routes 2 and 4

The Minnesota River Valley National Scenic Byway runs through Granite Falls on U.S. Highway 212 and County Road 67. Omro WMA is located along Granite Falls Routes 2 and 4. Within one mile of the proposed route alignment, there are four additional WMAs: Big Rock, Oshkosh, Myhre, and Lanners. The Minnesota River is designated as a Wild and Scenic River in Granite Falls, attracting canoeists and wildlife observers.

Historical museums within the vicinity of the proposed route alignment include the Yellow Medicine Historical Museum and the Volstead Museum in the Granite Falls. Granite Falls hosts Western Fest in midsummer, which features a parade, street dancing, a rodeo and Ole and Lena Days in midwinter, featuring a Scandinavian food fair, medallion hunt and snow sculpting. Prairie's Edge Casino Resort, also located in Granite Falls, attracts tourists to the area as well (Explore Minnesota 2005).

8.2.3.4 Mining

The mining resources for Granite Falls Routes 2 and 4 are similar to those for Granite Falls Routes 1 and 3 in Section 8.1.3.4.

8.2.3.5 Impacts and Mitigation: Land-Based Economies

Agriculture

During construction, temporary impacts, such as soil compaction and crop damage within the ROW, are likely to occur. The Applicants will work with landowners to minimize impacts to farming operations along the route alignment, such as by aligning the transmission line along section and field lines. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Route 2

The Project will result in permanent and temporary impacts to farmland. Permanent impacts will occur as a result of structure placement along the proposed route alignment. The Applicants estimate permanent impacts to agricultural lands at approximately 1.4 acres for Granite Falls Route 2. Approximately 92 percent of the impacted soils would be prime farmland or farmland of statewide importance. During construction, temporary impacts such as soil compaction and crop damages within the ROW are likely to occur. The Applicants estimate that approximately 56 acres of agricultural land will be impacted temporarily by Granite Falls Route 2 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 2.0 acres.

Route 4

The Applicants estimate permanent impacts to agricultural lands at approximately 5.4 acres for Route 4. Approximately 95.4 percent of the impacted soils would be prime farmland or farmland of statewide importance. The Applicants estimate that approximately 222 acres of agricultural land will be impacted temporarily by Route 4 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 7.0 acres.

The route alignment crosses two center-pivot irrigation systems. The Applicants will work with landowners to minimize impacts to farming and avoid center-pivot irrigated areas whenever possible.

Routes 2 and 4

The Applicants estimate permanent impacts to agricultural lands at approximately 7.6 acres for Granite Falls Routes 2 and 4. Approximately 94.2 percent of the impacted soils would be prime farmland or farmland of statewide importance. The Applicants estimate that approximately 313 acres of agricultural land will be impacted temporarily by Granite Falls Routes 2 and 4 due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 11.0 acres.

Forestry

See Section 8.1.3.5 for potential impacts and mitigation measures related to forestry along Granite Falls Routes 2 and 4. Impacts along Granite Falls Route 2 to shelterbelts is estimated at 13.9 acres. Impacts along Granite Falls Route 4 to shelterbelts is estimated at 15.3 acres.

Tourism

No impacts to area tourism are anticipated from the presence of the transmission line for any of the routes, and no mitigation is necessary.

Mining

Based on a review of existing information, Granite Falls Routes 2 and 4 would not impact active mining or quarrying operations. No mitigation is necessary.

8.2.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Route 2

No previously-identified archaeological and historic resources are within 500 feet of Granite Falls Corridor Route 2.

No previously inventoried standing structures have been recorded within one mile of Granite Falls Corridor Route 2.

Route 4

No previously-identified archaeological resources are within 500 feet of Granite Falls Corridor Route 4.

Four previously inventoried standing structures have been recorded within one mile of Granite Falls Corridor Route 4 (Appendix L.2). Historic standing structures include a bridge, two schools and one town hall. Construction dates of inventoried historic structures ranges from 1895 to 1920. Bridge L07845 (LP-MEH-004) in Lac Qui Parle County, is considered eligible for listing on the NRHP.

Routes 2 and 4

No previously-identified archaeological resources are within 500 feet of Granite Falls Corridor Routes 2 and 4.

Ninety-three previously inventoried standing structures have been recorded within one mile of Granite Falls Corridor Routes 2 and 4 (Appendix L.2). Historic standing structures include active and abandoned farmstead complexes, schools, industrial structures, churches, bridges, commercial buildings, residences, other community buildings, and parks. Construction dates of inventoried historic structures generally range from the 1870s to 1970.

Many of these structures are in residential centers. Eighty-six structures are in Granite Falls, including the NRHP-eligible Pillsbury House (CP-GRN-005) and the NRHP-listed Andrew J.

Volstead House (YM-GRN-016) and the Weaver House (CP-GRN-011). Three structures are in the St. Leo.

The 1858 to 1880s PLS maps show cultural features, identified during the 19th-century government survey. Cultural features in the corridor include railroad alignments trails/roads, farms/structures, miscellaneous features and the boundaries of the Upper Sioux Reservation.

8.2.4.1 Impacts and Mitigation: Archaeological and Historic Resources

See Section 6.1.4.3 for potential impacts and mitigation measures related to archaeological and historic resources along Granite Falls Routes 2 and 4.

8.2.5 NATURAL ENVIRONMENT

8.2.5.1 Air Quality

See Section 6.1.5.1 for a general discussion of air quality along Granite Falls Routes 2 and 4.

8.2.5.2 Water Quality

Route 2

Granite Falls Route 2 lies within the Lac Qui Parle watershed of the Minnesota River Basin (MPCA 2005). Surface water flows generally north and east toward the Minnesota River along the route alignment. Surface water resources along the route alignment include Monighan Creek, the West Fork of the Lac Qui Parle River, and tributaries to Lac Qui Parle River and Cobb Creek. Streams along the route alignment have generally been left in their natural, meandering condition.

Individual Public Waters (stream and ditch crossings) are listed in Table 64. Public waters are defined in Section 13.0.

TABLE 64
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-16	West Fork Lac Qui Parle River Unnamed Tributary to Cobb Creek Unnamed Tributary to Florida Creek
G-23	Florida Creek

Source: DNR 2004. Public Waters Inventory Maps

The route alignment crosses five wetlands (two palustrine emergent and a palustrine scrub/shrub along the Segment G-14 alignment and a palustrine emergent and a palustrine forested in Segment

G-16) identified by the NWI (FWS 2005, National Wetland Inventory). None of the wetlands are listed as Public Waters. Some of these wetlands may be hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act. Both the PWI and NWI information related to the route are identified on the maps in Appendix H.

There are no MPCA-listed impaired waters along the route.

Route 4

Granite Falls Route 4 lies within the Lac Qui Parle watershed of the Minnesota River Basin (MPCA 2005). Surface water flows generally north and east toward the Minnesota River along the route alignment. Surface water resources along the route alignment include Crow Creek, Lost Creek, the West Fork of the Lac Qui Parle River, the Yellow Bank River, and tributaries to Lac Qui Parle River. Streams along the route alignment have generally been left in their natural, meandering condition.

Along Granite Falls Route 4, the South Fork of the Yellow Bank River is listed on the NRI for its scenic, recreational, geologic, fishery, wildlife, historic and cultural values.

Individual Public Waters (stream and ditch crossings) are listed in Table 65. Public waters are defined in Section 13.0.

TABLE 65
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-54	North Fork Yellow Bank River
G-55	Unnamed Tributary to Quilitz WMA South Fork Yellow Bank River (3 crossings)
G-56	Unnamed Tributary to Lac Qui Parle River Unnamed Tributary to Lac Qui Parle River
G-57	Unnamed Tributary to Lac Qui Parle River
G-58	Florida Creek Cobb Creek Lac Qui Parle River Lost Creek

Source: DNR 2004. Public Waters Inventory Maps

The route alignment will cross seven wetlands identified by the NWI, six of which are palustrine emergent type (FWS 2005, National Wetland Inventory). None of the wetlands are listed as Public Waters. Some of these wetlands may be hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act. The number and type of NWI wetlands crossed by the route alignment are shown in Table 66. Both the PWI and NWI information related to the route are identified on the maps in Appendix H.

TABLE 66
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland
G-54	No wetland crossings
G-55	1 palustrine emergent
G-56	2 palustrine emergent, 1 palustrine forested
G-57	No wetland crossings
G-58	3 palustrine emergent

There are no MPCA-listed impaired waters along the route.

Routes 2 and 4

Granite Falls Routes 2 and 4 lie within the Minnesota River (Granite Falls) and Lac Qui Parle watersheds of the Minnesota River Basin (MPCA 2005). Surface water flows generally north and east toward the Minnesota River along the route alignment. Surface water resources along the route alignment include the Minnesota River, Lac Qui Parle River, Florida Creek, Canby Creek, Spring Creek and tributaries to those waters.

Along Granite Falls Routes 2 and 4, the Minnesota River is listed on the NRI for its scenic, recreational, wildlife, and historic values (NPS 2005).

Individual Public Waters (stream and ditch crossings) are listed in Table 67. Public waters are defined in Section 13.0.

TABLE 67
PUBLIC WATER CROSSINGS BY SEGMENT

Segment	Waterbody Name
G-24	Unnamed Tributary to Canby Creek
G-27	Unnamed Tributary to Canby Creek
G-29	Canby Creek
G-42	Lac Qui Parle River Unnamed Tributary to Spring Creek Unnamed Tributary to Spring Creek (2 crossings)
G-46	Unnamed Tributary to Spring Creek Unnamed Tributary to Spring Creek Spring Creek (6 crossings)
G-47	Spring Creek
G-51	Hazel Creek County Ditch #6
G-52	County Ditch # 39
G-53	Minnesota River

Source: DNR 2004. Public Waters Inventory Maps

The route alignment will cross 26 wetlands identified by the NWI, 17 of which are palustrine emergent type (FWS 2005, National Wetland Inventory). None of the wetlands are Public Waters. Some of these wetlands may be hydrologically connected to area rivers and streams. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act. The number and type of NWI wetlands crossed by the route alignment are shown in Table 68. Both the PWI and NWI information related to the route are identified on the maps in Appendix H.

TABLE 68
WETLAND CROSSINGS BY SEGMENT

Segment	Number and Type of Wetland
G-24	1 palustrine emergent
G-26	No wetland crossings
G-27	No wetland crossings
G-29	No wetland crossings
G-32	No wetland crossings
G-34	1 palustrine emergent
G-38	No wetland crossings
G-42	No wetland crossings
G-44	No wetland crossings
G-46	6 palustrine emergent, 4 palustrine forested, 3 palustrine unconsolidated bottom
G-47	1 palustrine forested
G-48	No wetland crossings
G-51	No wetland crossings
G-52	6 palustrine emergent
G-53	3 palustrine emergent, 1 riverine

The MPCA lists the Lac Qui Parle River as being impaired for mercury, fecal coliform and low oxygen. The Minnesota River is impaired for mercury and fecal coliform (MPCA 2004).

8.2.5.3 Flora

Route 2

Granite Falls Route 2 is located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation that may be found in scattered prairie remnants within this ecoregion, as well as the common agricultural products found in cultivated areas.

The GAP land cover types along the route alignment are shown in Table 69. The GAP land cover data shows that approximately 98 percent of the land along the route is in agricultural uses. Appendix I.1 lists the specific GAP categories for each of the general cover types shown below.

TABLE 69
GAP LAND COVER – GRANITE FALLS ROUTE 2

Cover Type	Area (acres)	Percent of Route
Agriculture	1,894	97.9
Wetland/Riparian/Open Water	7	0.4
Forest	33	1.7
Shrubland	0	0.0
Prairie	0	0.0
Developed	0	0.0

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data

There are no WMAs within the route. There is one DNR-listed mesic prairie community along Segment G-14 and three DNR-listed dry hill prairie natural communities along Segment G-16. Within one mile of the route alignment, there are nine additional natural communities listed by the DNR: one mixed emergent marsh (prairie subtype) community and eight dry hill prairie communities (Minnesota Natural Heritage and Nongame Wildlife Program 2005). DNR data describing railroad prairies was also analyzed for the route. Results of the analysis are presented in Section 8.2.6.

Along the route, there are approximately 38 acres of FWS grassland easements and 57 acres of FWS wetland easements.

Route 4

Granite Falls Route 4 is located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation that may be found in scattered prairie remnants within this ecoregion, as well as the common agricultural products found in cultivated areas.

The GAP land cover types along the route are shown in Table 70. The GAP land cover data shows that approximately 98 percent of the land along the route is in agricultural uses. Appendix I.1 lists the specific GAP categories for each of the general cover types shown below.

TABLE 70
GAP LAND COVER – GRANITE FALLS ROUTE 4

Cover Type	Area (acres)	Percent of Route
Agriculture	8,470	98.3
Wetland/Riparian/Open Water	85	1.0
Forest	59	0.7
Shrubland	0	0.0
Prairie	0	0.0
Developed	0	0.0

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data

Within the route, Walter WMA contains grassland and marsh vegetation. There are two DNR-listed dry hill prairie natural communities along Segment G-58. Within one mile of the route alignment, there are 28 natural communities listed by the DNR: 10 mesic prairies, eight wet prairies and 10 dry hill prairie communities (Minnesota Natural Heritage and Nongame Wildlife Program 2005). The route alignment crosses Walter WMA. DNR data describing railroad prairies was also analyzed for the route. Results of the analysis are presented in Section 8.2.6.

Along the route, there are approximately 27 acres of FWS habitat easements and 117 acres of FWS wetland easements.

Routes 2 and 4

Granite Falls Routes 2 and 4 are located within the Northern Glaciated Plains Ecoregion. Section 6.1.5.3 describes the native vegetation that may be found in scattered prairie remnants within this ecoregion, as well as the common agricultural products found in cultivated areas.

The GAP land cover types along the route are shown in Table 71. The GAP land cover data shows that approximately 97 percent of the land along the route is in agricultural uses. Appendix I.1 lists the specific GAP categories for each of the general cover types shown below.

TABLE 71
GAP LAND COVER – GRANITE FALLS ROUTES 2 AND 4

Cover Type	Area (acres)	Percent of Route
Agriculture	11,931	97.4
Wetland/Riparian/Open Water	162	1.3
Forest	106	0.9
Shrubland	53	0.4
Prairie	0	0.0
Developed	0	0.0

Source: USGS 2004. Upper Midwest Gap Analysis Program Landcover Data

Omro WMA is located along Granite Falls Routes 2 and 4; it has wetland and grassland vegetation. There are four DNR-listed native plant communities within the route: one dry prairie community and two rock outcrop communities along the Segment G-52 alignment, and one dry prairie community along the Segment G-53 alignment. Within one mile of the route alignment, there are 19 additional natural communities listed by the DNR (Minnesota Natural Heritage and Nongame Wildlife Program 2005). The route alignment does not cross Omro WMA. DNR data describing railroad prairies was also analyzed for the route. Results of the analysis are presented in Section 8.2.6.

Along the route, there are approximately 22 acres of FWS wetland easements.

8.2.5.4 Fauna

Although 97 percent of the land adjacent to the route is cultivated, there are several WMAs and WPAs in the route that provide habitat for a variety of animal species. The WMAs are managed by the DNR for wildlife production, with primary game species consisting of waterfowl, pheasants, and white-tailed deer. Section 6.1.5.4 lists common wildlife species found in the project vicinity.

Most of the route is adjacent to cultivated land, which provides some cover for the common fauna known to inhabit Minnesota. A discussion of common wildlife and avian resources is given in Section 6.1.5.4, and a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

Along Granite Falls Route 2, the Segment G-14 and G-16 alignments pass through areas designated by the FWS and DNR joint assessment as having both important grassland and wetland habitats for waterfowl. Along Granite Falls Route 4, the Segment G-55, G-56, G-57 and G-58 alignments cross high priority areas. Along Granite Falls Routes 2 and 4, the Segment G-24, G-26, G-45, G-52 and G-53 alignments cross high priority areas (FWS and DNR 2005). The high priority areas listed in the FWS and DNR joint assessment are identified in Appendix K.5. See Section 6.1.5.4 for a discussion of the joint assessment.

There is one colonial bird nesting site within one mile of Segment G-58 containing great blue herons (*Ardea herodias*). There is one mussel sampling site in the Minnesota River within one mile of Segment G-53, along Granite Falls Routes 2 and 4.

8.2.5.5 Impacts and Mitigation: Natural Environment

Air Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to air quality along Granite Falls Routes 2 and 4.

Water Quality

See Section 6.1.5.5 for potential impacts and mitigation measures related to water quality along Granite Falls Routes 2 and 4. No permanent impacts to wetlands or water resources are anticipated for Granite Falls Route 2. For Granite Falls Route 4, permanent impacts along the Segment G-56 alignment will likely occur because the route alignment crosses a wetland complex that is wider than 1,000 feet. It is anticipated that a maximum of one structure may be placed in this wetland, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact and 25,000 square feet of temporary impact. The Applicants will obtain utility crossing permits from the DNR for any PWI water crossed.

For Granite Falls Routes 2 and 4, permanent impacts along the Segment G-46 alignment will likely occur because The route alignment crosses a wetland that is wider than 1,000 feet. It is anticipated that a maximum of one structure may be placed in these wetlands, resulting in approximately 1,000 square feet (0.023 acres) of permanent impact and 25,000 square feet of temporary impact. The Applicants will obtain utility crossing permits from the DNR for any PWI water crossed.

Flora

As stated in Section 6.1.5.5, native vegetation is anticipated to be minimal and impacts to WPAs and Federally-funded WMAs may require a compatibility analysis.

Route 2

The Applicants will span areas containing natural communities wherever possible. The remnant prairie communities (both DNR-listed and those found during the 2005 survey) along the Route will be spanned, as feasible, and no permanent impacts will occur.

The Applicants will continue to work with the DNR and FWS to minimize and avoid impacts to sensitive flora along the route alignment. The Applicants will survey the approved route for threatened and endangered species and will span any areas found to contain rare species. 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.

No easements in FWS easements or Federally-funded WMAs are anticipated.

Route 4

Permanent impacts to Walter WMA along Segment G-56 will be avoided by crossing on the west side of the roadway where it is less than 1,000 feet wide (and therefore spannable), and then crossing to the eastern side of the roadway to avoid a wider segment on the west. It is estimated that approximately 2.1 acres of easements will be necessary within Walter WMA. Additionally, the Applicants estimate that approximately 0.4 acres of easements within FWS easements will be necessary.

The Applicants will attempt to avoid placing structures in the DNR-listed natural communities along the route. However, there is one wet prairie community along the Segment G-56 alignment and one mesic prairie community along the Segment G-58 alignment that are wider than 1,000 feet. The Applicants will likewise attempt to span the surveyed remnant prairie communities whenever feasible. There are two communities, a dry prairie community along the Segment G-55 alignment and a wet prairie community along G-56 (corresponding to the DNR-listed community) that are wider than 1,000 feet. It is therefore probable that structures would need to be placed in these resources.

Routes 2 and 4

The Applicants intend to and will work diligently to avoid any direct impacts to WMAs within the route. An approximately 0.1-acre easement within Omro WMA will likely be necessary. No easements within FWS easements are anticipated.

The Applicants will attempt to avoid placing structures in the surveyed remnant prairie communities along the route. However, one rock outcrop remnant along the Segment G-52 alignment is wider than 1,000 feet: it is likely that structures will be placed in this community. A maximum of five structures are anticipated, which would result in approximately 5,000 square feet of impacts to the rock outcrop. The Applicants will attempt to avoid placing structures in rocky areas withing this community; the Applicants are considering construction options to avoid and minimize impacts to this area. None of the DNR-listed natural communities within the route are wider than the maximum span length; therefore no permanent impacts to these vegetative communities are expected to result.

Mitigation measures described above for Route 2 will also be applied for Granite Falls Routes 2 and 4.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

As stated in Section 6.1.5.5, there is minimal potential for the displacement of wildlife and loss of habitat from construction of the Granite Falls routes.

Similar to the other routes, avian collisions are a possibility after construction. Along Granite Falls Route 2, the Segment G-14 and G-16 alignments pass through areas designated by the FWS and DNR joint assessment as having both important grassland and wetland habitats for waterfowl. Along Granite Falls Route 4, the Segment G-55, G-56, G-57 and G-58 alignments cross high priority areas. Along Granite Falls Routes 2 and 4, the Segment G-24, G-26, G-45, G-52 and G-53 alignments cross high priority areas. 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 Applicants will work with the FWS and DNR to minimize impacts along these segments as necessary.

See Section 6.1.5.5 for potential impacts and mitigation measures related to fauna along Granite Falls Routes 2 and 4. There are no DNR-listed railroad prairies along the route.

8.2.6 RARE AND UNIQUE NATURAL RESOURCES

8.2.6.1 Route 2

Table 72 lists the rare or unique resources identified within one mile of Granite Falls Route 2. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Granite Falls Route 2 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 72
RARE AND UNIQUE RESOURCES – GRANITE FALLS ROUTE 2

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Low Milk-vetch	3	*Astragalus lotiflorus*	Not Listed	NON	NR	Tallgrass prairie
White Prairie-clover	1	*Dalea candida var. oligophylla*	Not Listed	SPC	S3	Mesic prairie
Pawnee Skipper	1	*Hesperia leonardus pawnee*	Not Listed	SPC	S3	Sandy prairie
Dry Prairie (Southwest) Hill Subtype	11		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	1		Not Listed	None	S2	
Mixed Emergent Marsh (Prairie) Subtype	1		Not Listed	None	NR	

** 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

There are no areas listed by the DNR MCBS as having medium, high or outstanding biodiversity significance along the route. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Granite Falls Route 2. There are no DNR-listed railroad prairies along the route.

An initial survey conducted in June 2005 showed that the route alignment crosses two remnant dry prairie communities along the Segment G-16 alignment (GES 2005).

8.2.6.2 Route 4

Table 73 lists the rare or unique resources identified within one mile of Granite Falls Route 4. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Granite Falls Route 4 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 73
RARE AND UNIQUE RESOURCES – GRANITE FALLS ROUTE 4

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Red Three-awn	1	*Aristida purpurea var. longiseta*	Not Listed	SPC	S3	Gravelly dry prairies on steep moraines, fossil beach ridges, kames and eskers
Slender Milk-vetch	1	*Astragalus flexuosus*	Not Listed	SPC	S3	Mesic and dry mesic prairies
Low Milk-vetch	5	*Astragalus lotiflorus*	Not Listed	NON	NR	Tallgrass prairies
Missouri Milk-vetch	2	*Astragalus missouriensis*	Not Listed	SPC	S3	Dry, gravelly prairie slopes, often in open soil
Arogos Skipper	1	*Atrytone arogos*	Not Listed	SPC	S3	Undisturbed grasslands, prairies, sand prairies; caterpillar host is big bluestem
Upland Sandpiper	3	*Bartramia longicauda*	Not Listed	NON	S4	Dry prairies
Prairie Moonwort	1	*Botrychium campestre*	Not Listed	SPC	S3	Gravelly dry prairies on north-facing hillsides
Colonial Waterbird Nesting Site	1	*Colonial Waterbird Nesting Area*	Not Listed	None	NR	
Cutleaf Ironplant	2	*Haplopappus spinulosus*	Not Listed	SPC	S3	Excessively-drained hillsides (often river bluffs, kames, skers or morainic ridges), in gravelly or sandy soils
Dakota Skipper	1	*Hesperia dacotae*	Candidate	THR	S2	Wet prairie and dry prairie dominated by bluestem grasses
Western Hognose Snake	1	*Heterodon nasicus*	Not Listed	SPC	S3	In western Minnesota, this species occurs in sandy and gravelly areas of fluvial or glacial origins. Throughout its range, this species is also found in grassland, prairie and mixed forest/prairie habitats
Loggerhead Shrike	1	*Lanius ludovicianus*	Not Listed	THR	S2	Open country and dry upland prairie where hedgerows, shrubs and small trees occur
Powesheik Skipper	1	*Oarisma powesheik*	Not Listed	SPC	S3	Wet mesic prairie with native grasses, sedges and a significant number of plants in the sunflower family
Wilson's Phalarope	2	*Phalaropus tricolor*	Not Listed	THR	S2	Quiet, shallow pools bordered by wet meadows. The nests are usually located in the wet madow or adjacent upland prairie areas.
Bunch Speargrass	1	*Poa arida*	Not Listed	NON	NR	Alkaline mudflats and coulees. Also occurs in dry or moist patches in pastures, along roadways and railroads, in sandy and/or alkaline soil
Soft Goldenrod	1	*Solidago mollis*	Not Listed	SPC	S3	Dry, gravelly soil in shortgrass prairies

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Burrowing Owl	2	*Speotyto cunicularia*	Not Listed	END	S1	Native, mixed-grass pariries or heavily grazed pastures that are populated with Richardson's ground squirrels
Yellow Prairie Violet	1	*Viola nuttallii*	Not Listed	THR	S2	Loose, barren soil on gravelly kame and morainic formations
Dry Prairie (Southwest) Hill Subtype	12		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	10		Not Listed	None	S2	
Wet Prairie (Southwest) Subtype	8		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

There are no areas listed by the DNR MCBS as having medium, high or outstanding biodiversity significance along the route. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Granite Falls Route 4. There are no DNR-listed railroad prairies along the route.

An initial survey conducted in October 2005 showed that the route alignment crosses two remnant dry prairie communities (one along the Segment G-54 alignment and one along the Segment G-55 alignment), three mesic prairie communities (one each along the Segment G-55, G-56 and G-58 alignments) and two wet prairie communities (both along the Segment G-56 alignment) (GES 2005).

8.2.6.3 Routes 2 and 4

Table 74 lists the rare or unique resources identified within one mile of Granite Falls Routes 2 and 4. These resources were identified using the DNR Natural Heritage Database.

Many of the rare and unique resources identified along Granite Falls Routes 2 and 4 are associated with remnants of prairie land, which were once abundant in this area of Minnesota.

TABLE 74
RARE AND UNIQUE RESOURCES – GRANITE FALLS ROUTES 2 AND 4

Common Name	Number of Occurrences	Scientific Name	Federal Status	MN Status*	State Rank**	Habitat
Mucket mussel	1	*Actinonaias ligamentina*	Not Listed	THR	S2	Medium to large rivers in sand and gravel
Elktoe mussel	1	*Alasmidonta marginata*	Not Listed	THR	S2	Mediium to large rivesr in sand and gravel
Low Milk-vetch	1	*Astragalus lotiflorus*	Not Listed	NON	NR	Tallgrass prairie
Missouri Milk-vetch	1	*Astragalus missouriensis*	Not Listed	SPC	S3	Dry, gravelly prairie slopes, often in open soil
Eastern Fox Snake	3	*Elaphe vulpina*	Not Listed	NON	S4	Woods, old fields and dune areas
Spike mussel	1	*Elliptio dilatata*	Not Listed	SPC	S3	Small to large streams, occassionally lakes, in mud or gravel
Mussel Sampling Site	1	*Freshwater Mussel Concentration Area*	Not Listed	None	NR	
Bald Eagle	1	*Haliaeetus leucocephalus*	THR	SPC	S3	Forested areas near lakes and rivers
Fluted-shell	1	*Lasmigona costata*	Not Listed	SPC	S3	Medium to large rivers in sand and gravel
Black Sandshell	1	*Ligumia recta*	Not Listed	SPC	S3	Medium to large rivers in riffles or raceways in mud and sand
Salamander Mussel	1	*Simpsonaias ambigua*	Not Listed	THR	S2	Medium to large rivers in mud and gravel, or under flat slabs of rock
Dry Prairie (Southwest) Hill Subtype	9		Not Listed	None	S2	
Mesic Prairie (Southwest) Subtype	1		Not Listed	None	S2	
Rock Outcrop (Southwest) Subtype	13		Not Listed	None	NR	

** 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

There are no areas listed by the DNR MCBS as having medium, high or outstanding biodiversity significance along the route. See Section 6.1.6 for potential impacts and mitigation measures related to special status species along Granite Falls Routes 2 and 4. There are no DNR-listed railroad prairies along the route.

An initial survey conducted in June 2005 showed that the route alignment crosses four remnant prairie communities: one rock outcrop community and one dry prairie community along the Segment G-52 alignment, and one dry prairie community and one rock outcrop community along the Segment G-53 alignment (GES 2005).

8.2.6.4 Impacts and Mitigation: Rare and Unique Natural Resources

Route 2

A search of the DNR's Minnesota Natural Heritage Database identified two species of special concern within one mile of the route alignment. Thirteen DNR listed natural communities are within one mile of the route alignment. No impacts to the natural communities or special status species are expected to result.

Route 4

A search of the DNR's Minnesota Natural Heritage Database identified one Federal candidate species/State threatened species (Dakota skipper), one State endangered species (burrowing owl), three State threatened species (loggerhead shrike, Wilson's phalarope and yellow prairie violet) and nine species of special concern within one mile of the route alignment. Most of the instances identified by the Natural Heritage Database occur within the DNR's WMAs along the route alignment. Thirty DNR listed natural communities are within one mile of the route alignment.

The Applicants will attempt to avoid placing structures in the DNR-listed natural communities along the route. However, there is one wet prairie community along the Segment G-56 alignment and one mesic prairie community along the Segment G-58 alignment that are wider than 1,000 feet. It is therefore probable that structures would need to be placed in these resources. Because the Dakota skipper is a prairie species, it is possible that habitat could be affected by placing structures in these mesic prairie communities. The burrowing owl and Wilson's phalarope also use upland prairie areas for nesting and forage. Yellow prairie violets can be found in dry patches within prairie remnants. Many of the special concern species are also associated with prairies and could therefore be affected. The Applicants will conduct a special status species survey to determine the presence of any listed species within the prairie communities and will coordinate with the DNR to minimize and mitigate any impacts. Shelterbelts and hedgerows will be conserved as possible. These habitats are important to loggerhead shrikes. In the event shelterbelts and hedgerows for a known Loggerhead Shrike population must be affected, the Applicants will work with the DNR on appropriate mitigation.

Routes 2 and 4

A search of the DNR's Minnesota Natural Heritage Database identified one instance of a Federal threatened/State special concern species (bald eagle), three State threatened species (mucket mussel, elktoe mussel and salamander mussel), and four species of special concern within one mile of the route alignment. Most of the instances identified by the Natural Heritage Database occur within the DNR's WMAs along the route alignment and along the Minnesota River. Twenty three DNR listed natural communities are within one mile of the route alignment. No impacts to the natural communities are expected to result. Due to the difficulty of constructing in rock outcrops, and the sensitive nature of the plant communities within these areas, the Applicants are considering construction options in the rock outcrops areas near Granite Falls. If construction within outcrops cannot be avoided, surveys will be conducted and the appropriate agencies will be consulted to assure impacts to listed species are avoided or minimized.

Bald eagles are most adversely affected by human activities during the breeding and nesting seasons. The DNR has developed seasonal timeframes delineating eagles' critical development periods. February 10th to May 1st is the most critical segment when eagles are involved with courtship, egg-laying and incubation (DNR 2003, Environmental Review Fact Sheet Series). Construction noise and activity during critical development periods of bald eagles may cause nest abandonment, premature fledging of young birds, increased stress at a winter roost site and loss of habitat for nesting and roosting. Areas with known active nests will be avoided, as practical, during critical periods. Construction will be restricted within ¼ mile of an active nest during critical development periods. The identified nest is approximately 0.24 miles from the route alignment. If an active nest is located along the route, the Applicants will work with the FWS and DNR to determine appropriate minimization and mitigation procedures.

The mucket mussel, elktoe mussel and salamander mussel, all State threatened species, and other special status mussels, occur in rivers such as the Minnesota River. The Applicants will avoid impacting these species by spanning the Minnesota River.

8.3 PREFERRED ROUTE

The deciding factors in selection of Granite Falls Route 1 as the preferred route are as follows:

- Granite Falls Route 1 follows existing transmission line ROW for approximately 84 percent of the route and 11 percent of the route parallels transportation ROW. In contrast, 16 percent of Route 2 follows existing transmission line ROW and 76 percent of the route uses transportation ROW; 56 percent of Route 3 follows transmission line ROW and 11 percent of the route parallels transportation ROW; and 24 percent of Route 4 follows existing transmission line ROW and 65 percent of the route parallels transportation right-or-way. Granite Falls Route 1 therefore is more consistent with the State's nonproliferation policy expressed by the Minnesota Supreme Court in [People for Environmental Enlightenment and Responsibility, Inc. (PEER) vs. Minnesota Environmental Quality Council, 266 N.W.2d 858, 868 (Minn. 1978) and confirmed in Minnesota Rules part 4400.3150, items H and J] of preferring existing ROWs to new ROW (See Section 5.3).
- Although the structures proposed for Granite Falls Route 1 will be slightly taller than the existing structures along the rebuild sections, the route will not be a new visual feature. Though the route will potentially cause visual impacts to 9 homes along the route, the change in height will be minimally noticeable compared to the existing environment. Visual impacts associated with Granite Falls Route 1 will affect fewer homes (9) in comparison to Route 2 (29 homes), Route 3 (14 homes), and Route 4 (31 homes) .
- Granite Falls Route 1 is the least expensive and both Granite Falls Routes 1 and 2 would be less expensive to construct, operate and maintain than Granite Falls Routes 3 and 4. Costs for Route 1 are estimated between $24,136,733 and $33,148,320 and Route 2 is estimated between $25,615,337 and $31,814,148 in comparison to Route 3 construction costs between $40,939,609 and $48,680,260 and Route 4 costs are between $38,748,566 and $47,195,801. Although removal costs are higher for Granite Falls Route 1 compared to Route 2, the Applicants believe that the benefits of using existing transmission right of way outweigh the minimal additional costs of removing existing structures.

- Granite Falls Route 1 will have less agricultural impact. Route 1 will cause approximately 8.2 acres of permanent impacts compared to Route 2's approximately 9 acres, Route 3's approximately 12.6 acres and Route 4's approximately 13 acres of permanent impacts. Similarly, Route 1 will have approximately 357 acres of temporary impacts compared to Route 2's 382 acres, Route 3's 503, and Route 4's 553 acres of temporary impacts.
- Granite Falls Routes 1 and 3 will have less impact on the sensitive rock outcrop communities along the Minnesota River near Granite Falls. The route traverses a narrower section of surveyed rock outcrop community that Granite Falls Routes 2 and 4, and will require fewer structures (three vs. five) to be placed in this resource.
- The Applicants believe that Granite Falls Route 1 also best addresses public concerns raised at public meetings, by utilizing existing right of way and minimizing impacts to landowners, businesses, population concentrations, agricultural resources and wildlife resources.

TABLE 75
FACTORS CONSIDERED FOR THE GRANITE FALLS ROUTE

Factor	Granite Falls Route 1	Granite Falls Route 2	Granite Falls Route 3	Granite Falls Route 4	Lesser Impacts
Effects on Human Settlement and Aesthetics					
Displacement	None	None	None	None	--
Noise	Noise levels will be within state standards and below background levels.	Same	Same	Same	--
Aesthetics	Structures and transmission line will affect viewscape.However, 95 percent of the route follows existing disturbed (Transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 9 homes along the route.	Structures and transmission line will affect viewscape.However, 92 percent of the route follows existing disturbed (Transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 29 homes along the route.	Structures and transmission line will affect viewscape.However, 67 percent of the route follows existing disturbed (Transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 14 homes along the route.	Structures and transmission line will affect viewscape.However, 89 percent of the route follows existing disturbed (Transmission line and/or road) corridors. Placement of the transmission line will potentially cause visual impacts to 31 homes along the route.	Route 1

Factor	Granite Falls Route 1	Granite Falls Route 2	Granite Falls Route 3	Granite Falls Route 4	Lesser Impacts
Cultural Values	None	None	None	None	--
Recreation	There would be minimal visual ipact to the 1 SNA, 8 WMAs and 1 WPA within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	There would be minimal visual ipact to the 6 WMAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	There would be minimal visual ipact to the 2 SNAs, 11 WMAs and 5 WPAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	There would be minimal visual ipact to the 11 WMAs and 4 WPAs within a mile of the alignment. No direct impacts to recreation opportunities are anticipated.	--
Public Services	None	None	None	None	--
Socioeconomic	Minor positive short-term effects from construction activities to local economy expected.	Same	Same	Same	--
Effects on Public Health and Safety	None	None	None	None	--
Effects on Land-based Economies	Pole placement will impact the corridor. Termporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 357 acres of agricultural land. Permanent impacts are estimated at 8.2 acres.	Pole placement will impact the corridor. Termporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 382 acres of agricultural land. Permanent impacts are estimated at 9.0 acres.	Pole placement will impact the corridor. Termporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 503 acres of agricultural land. Permanent impacts are estimated at 12.6 acres.	Pole placement will impact the corridor. Termporary impacts, including soil compaction and crop damages are also likely. Temporary impacts are expected to affect 553 acres of agricultural land. Permanent impacts are estimated at 13 acres.	Route 1
Effects on Archaeological and Historic Resources	Direct impacts to cultural resources will be avoided whenever possible. There are 2 archeological sites within 500' and 103 structures within a mile of alignment.	Direct impacts to cultural resources will be avoided whenever possible. There are no archeological sites within 500' and 93 structures within a mile of alignment.	Direct impacts to cultural resources will be avoided whenever possible. There are 2 archeological sites within 500' and 129 structures within a mile of alignment.	Direct impacts to cultural resources will be avoided whenever possible. There are no archeological sites within 500' and 97 structures within a mile of alignment	--

Factor	Granite Falls Route 1	Granite Falls Route 2	Granite Falls Route 3	Granite Falls Route 4	Lesser Impacts
Effects on the Natural Environment					
Air	There will be no measurable impacts relative to ozone. Temporary air quality impacts will be caused by construction-related emissions.	Same	Same	Same	--
Water	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands are probable in Segment G-45. One structure in each of two wetlands would cause 2,000 ft^2 of permanent impacts.	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands are probable in Segment G-46. One structure in one wetland would cause 1,000 ft^2 of permanent impacts.	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands are probable in Segment G-45. One structure in each of two wetlands would cause 2,000 ft^2 of permanent impacts.	Temporary impacts to wetlands may occur if necessary for crossing. Permanent impacts to wetlands are probable in Segments G-46 and G-56. One structure in each of two wetlands would cause 2,000 ft^2 of permanent impacts.	Route 2

Factor	Granite Falls Route 1	Granite Falls Route 2	Granite Falls Route 3	Granite Falls Route 4	Lesser Impacts
Flora/Fauna	Nominal impacts are expected to flora given that the majority (95 percent) of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collisions. Structures will likely be placed in Lanners WMA, along the existing transmission line corridor. 6.8 acres of easements within Lanners are anticipated; 0.3 acres of easements in Omro WMA, and 0.7 acres of easements within FWS grassland easements are anticipated.	Nominal impacts are expected to flora given that the majority (92 percent) of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collisions. 0.1 acres of easements in Omro WMA are anticipated.	Nominal impacts are expected to flora given that the majority (67 percent) of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collisions. Structures will likely be placed in Lanners WMA, along the existing transmission line corridor. 6.8 acres of easements within Lanners are anticipated; 0.3 acres of easements in Omro WMA, and and 3.7 acres of easements in Plantation WMA are anticipated.	Nominal impacts are expected to flora given that the majority (89 percent) of the route follows already disturbed corridors. Impacts to fauna are possible due to transmission line collisions. 2.1 acres of easements in Walter WMA, 0.1 acres of easements in Omro WMA and 0.4 acres of easements within FWS habitat easements are anticipated.	
Effects on Rare and Unique Natural Resources	Approximately three structures will be placed in surveyed rock outcrop community in Segment G-50.	Approximately five structures will be placed in surveyed rock outcrop community in Segment G-52.	Approximately three structures will be placed in surveyed rock outcrop community in Segment G-50.	Approximately five structures will be placed in surveyed rock outcrop community in Segment G-52.	Routes 1 and 3
Application of Design Option that Maximize Energy Efficiencies, Mitigate Adverse Environmental Effects and Could Accommodatge Expansion of Transmission Capacity	Applicants will work with the affected alandowners to use a design that mitigates the impact on the affected landowners and the ROW. Expansion potential exists. However, there are no known or likely plans to add additional transmission capacity along the proposed route. Therefore, the design is appropriate to this Project and maximizes energy efficiency.	Same	Same	Same	--

Factor	Granite Falls Route 1	Granite Falls Route 2	Granite Falls Route 3	Granite Falls Route 4	Lesser Impacts
Use or Paralleling of Existing ROWs, Survey Lines, Natural Division Lines and Agricultural Field Boundaries	Majority (95 percent) of the route follows existing rights of way; agricultural field lines are used for the majority of the remainder of the route	Majority (92 percent) of the route follows existing rights of way; agricultural field lines are used for the majority of the remainder of the route	Majority (67 percent) of the route follows existing rights of way; agricultural field lines are used for the majority of the remainder of the route	Majority (89 percent) of the route follows existing rights of way; agricultural field lines are used for the majority of the remainder of the route	Route 1
Use of Existing Large Electric Power Generating Plant Site	N/A	N/A	N/A	N/A	--
Use of Existing Transportation, Pipeline and Electrical Transmission Systems or ROWs	84 percent of the route will follow existing transmission line right of way; 11 percent uses transportation right of way	16 percent of the route will follow existing transmission line right of way; 76 percent uses transportation right of way	56 percent of the route will follow existing transmission line right of way; 11 percent uses transportation right of way	24 percent of the route will follow existing transmission line right of way; 65 percent uses transportation right of way	Route 1
Electrical System Reliability	Line and route designed to provide reliable outlet capability	Same	Same	Same	--
Costs of Constructing, Operating and Maintaining the Facility which are Dependent on Design and Route	Construction costs estimated between$24,136,733 and $33,148,320	Construction costs estimated between$25,615,337 and $31,814,148	Construction costs estimated between $40,939,609 and $48,680,260	Construction costs estimated between $38,748,566 and $47,195,801	Routes 1 and 2
Adverse Human and Natural Environmental Effects which Cannot Be Avoided	Unavoidable adverse impacts include the physical impacts to the land (primarily agricultural land) associated with the Project. The Applicants will implement measures as described in the environmental analysis and as identified by regulatory agencies to minimize these unavoidable adverse environmental effects. These effects are similar for both routes proposed.				
Irreversible and Irretrievable Commitments of Resources	Irreversible and irretrievable resource commitments are related to the use of nonrenewable resources and the effects that the use of these resources have on future generations. Irreversible effects primarily result from use or destruction of a specific resource that cannot be replaced within a reasonable time frame. Irretrievable resource commitments involve the loss in value of an affected resource that cannot be restored as a result of the action. There are few commitments of resources associated with this Project that are irreversible and irretrievable, but include those resources primarily related to construction. Construction resources that will be used include aggregate resources, concrete, steel and hydrocarbon fuel. These resources will be utilized to construct the Project. During construction, vehicles will be traveling to and from the site, utilizing hydrocarbon fuels. These commitments of resources are similar for both routes proposed.				

9.0 ASSOCIATED FACILITIES

SYSTEM ALTERNATIVE 1

9.1 ORTONVILLE SUBSTATION 115 KV TRANSMISSION LINE REMOVAL

9.1.1 ASSOCIATED FACILITY DESCRIPTION

The Big Stone 230 kV Substation to Ortonville Substation 115 kV transmission line removal includes the removal of 115 kV H-frame structures into the Ortonville Substation. Approximately 1.2 miles (6,270 feet) of existing transmission line will be removed between the Ortonville Substation to the point where the existing 115 kV transmission line from the Big Stone 230 kV Substation turns northwest to enter the Ortonville Substation (Appendix B.1 and Appendix F.2). There are currently three 115 kV transmission lines that are in this corridor and the middle transmission line will be removed, which is currently the transmission line that is from the Big Stone 230 kV Substation.

9.1.2 ENVIRONMENTAL INFORMATION

9.1.2.1 Human Settlement

Public Health and Safety

See Section 6.1.2.1 for a general discussion of public health and safety in the area.

Commercial, Industrial and Residential Land Use

Zoning information was obtained from Ortonville. The city has zoned the land as general industrial (I-2). According to GAP land use information, existing ROW and water features occupy the site (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

The Ortonville Municipal Airport is located approximately one mile east of the Project area.

Displacement

Ortonville is located adjacent to the transmission line removal project area. There are eight residences located within 1,000 feet of the transmission line and the structures designated for removal. There are no residences within 500 feet.

Noise

See Section 6.1.2.1 for a general discusstion of noise along the Ortonville Substation115 kV transmission line removal.

Aesthetics

See Section 6.1.2.10 for a general discussion of aesthetics along the Ortonville Substation115 kV transmission line removal.

The existing viewshed of the residences near the area is cultivated land, grasslands, wetlands, other rural residences, commercial facilities, existing ROW, the Minnesota River and Big Stone Lake.

Socioeconomic

The transmission line and structure removal is located in Big Stone County. Table 10 under the Morris Route 1 Section 6.1.2.6 lists the specific U.S. Census block groups that the route alignment crosses and that are located near the substation. Appendix K.2 displays the locations of the block groups. As can be seen in Table 10, Morris Route 1 Section 6.1.2.6 does not contain populations of disproportionately high minority populations or low-income populations.

Table 11 under the Morris Route 1 Section 6.1.2.6 identifies the top three leading industries in Big Stone County.

Cultural Values

Four sites of cultural value are within 1,000 feet, but greater than 500 feet away, from the transmission line and structure removal area.

Recreation

Refer to Morris Route 1 Section 6.1.2.8 for a description of the recreation elements near the transmission line and structure removal area. Additionally, the transmission line to be removed and the substation to which it is connected are approximately 500 feet south of the shoreline of Big Stone Lake and 500 feet to the east of the Minnesota River. There is a public boat access and docks approximately 500 feet north of the stubstation, where the transmission line to be removed is located. The transmission line is within 1,000 feet of, and crosses, the Minnesota River, considered a State-designated canoe and boat route.

Public Services

Two other transmission lines parallel the transmission line to be removed. No public services, such as gas, sanitary sewer, potable water, are needed for the proposed removal actions. Excavation of the existing structures is anticipated to occur.

Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during removal of the transmission line and structures. Removal of the transmission line and structure will enhance public safety by lessening the possibility of a structure falling causing power outages or injury to the public.

Commercial, Industrial, Residential Land Use

Land use and zoning will not change with removal of the transmission line and structure. Transmission line and structure removal will not change or disrupt the Ortonville municipal airport safety or aircraft approach surface and primary zone.

Displacement

No displacement is anticipated with the removal project.

Noise

Noise impacts will be limited to the transmission line and structure removal phase. These impacts are short term. The ambient noise in the area should improve with removal of the transmission line.

Aesthetics

No aesthetic impacts are anticipated from removal of the transmission line. The aesthetics of the area should improve with removal of the transmission line. These improvements should be minor, as the transmission line being removed is west of the two other transmission lines that will remain in place.

Socioeconomic

It is anticipated that removal of the 115kV transmission line will occur at the same time as the 345kV transmission line construction. See Morris Route 1 Section 6.1.2.10 for a detailed analysis of the socioeconomic impacts.

Cultural Values

No impacts are anticipated, therefore no mitigation is needed.

Recreation

No impacts are anticipated, therefore no mitigation is needed.

Public Services

The Applicants will work with GopherOne Call to locate underground utilities prior to earthwork. No impacts are anticipated, therefore no mitigation is needed.

9.1.2.2 Land-Based Economics

Agriculture

Approximately 30 percent of the land associated with the transmission line removal area is used for agriculture (USGS 2004), the LaPrairie Silt Loam and Lamoure Silty Clay Loam soils are listed by the NRCS as prime farmland (USDA, NRCS 2005). The Rauville Silty Clay Loam within the area is not listed as a prime farmland soil.

There are no central-pivot irrigation systems located in the transmission line removal area.

Forestry

There are no forested parcels located within the transmission line removal area. The primary tree cover in the Project area is associated with waterways, urban development, and grasslands. No economically important forest resources are within the project area.

Tourism

No tourism features are associated with the 115kV transmission line and structure removal. Refer to Morris Route 1 Section 6.1.3.3 for a discussion of tourism associated with the 345kV transmission line project area in Big Stone County.

Mining

No mining areas are associated with the 115 kV transmission line and structure removal. Refer to Morris Route 1 Section 6.1.3.4 for a discussion of mining associated with the 345 kV transmission line Project area in Big Stone County.

Impacts and Mitigation: Land-Based Economies

Agriculture

The transmission line and structure removal will not result in permanent impacts to farmland. Temporary impacts may occur from transmission line and structure removal equipment, such as rutting and soil compaction. Transmission line and structure removal attempts will be made after the crops are harvested or before the fields are planted to avoid crop damage. However, the structure removal cannot be done in the winter months because the ground is frozen. The Applicants will work with landowners to alleviate rutting and soil compaction. Ultimately, transmission line and structure removal will help the farmer by increasing the land area available for agricultural production.

No impacts to central pivot irrigation are expected in association with the transmission line and structure removal.

Forestry

No economically important forest resources are located within the transmission line and structure removal area. No impacts to trees associated with residences or woodrows are anticipated to occur.

9.1.2.3 Archaeological and Historic Resources

The Applicants sponsored overviews of known cultural resources (archaeological resources and historic standing structures) within the corridors (Palmer et al. 2005a, 2005b, 2005c). Section 6.1.4 of the Morris Route 1 provides results of the archival review of previously recorded cultural resources and general information on the research methodology applied to the archival review. Detailed descriptions of these resources can be found in cultural resources overviews prepared by Palmer et al. (2005a, 2005b, 2005c).

9.1.2.4 Impacts and Mitigation: Archaeological and Historic Resources

No known archaeological resources and/or historic standing structures are within the transmission line and structure removal area. However, four known cultural resources areas are within 1,000 feet, but greater than 500 feet away from the transmission line and structure removal area; 113 architectural resources are located within one mile of the transmission line and structure removal area. As Section 6.1.4.3 of Morris Route 1 explains, construction of new transmission line facilities could impact previously identified and currently unknown cultural resources. The realized potential impacts will be determined once routes are selected within the proposed corridors. Refer to Section 6.1.4.3 for a discussion of project-related cultural resources compliance measures and management, these same procedures will occur on the substation expansion area if the route is selected.

9.1.2.5 Natural Environment

Air Quality

Refer to Morris Route 1 Section 6.1.5.1 for a discussion of existing climate and air quality conditions.

Water Quality and Wetlands

Refer to Morris Route 1 Section 6.1.5.2 for a discussion of existing water quality conditions.

The major surface water features within one mile of the transmission line and structure removal area are Big Stone Lake, Minnesota River, North Fork of the Whetstone River, intermittent unnamed stream, and wetlands. The NWI identifies many wetlands associated with the Minnesota and North

Fork of the Whetstone Rivers. Specifically, within the transmission line removal area NWI maps one palustrine emergent (PEMB) basin that is located south of U.S. Highway 12. There appears to be one palustrine emergent basin north of U.S. Highway 12 and south of the substation. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act.

Big Stone Lake, Minnesota River, and intermittent unnamed stream are the PWI identified lake and streams within the transmission line removal area. No PWI identified wetlands are located within the transmission line and structure removal area. Portions of the transmission line to be removed are located within a 100-year floodplain, but not a floodway.

Flora

The transmission line and structure removal area are found in the Northern Glaciated Plains Ecoregion. Refer to Morris Route 1 Section 6.1.5.3 for a discussion of native vegetation located within the Northern Glaciated Plains Ecoregion.

The GAP land cover data classifies the transmission line and structure removal area as cropland, grasslands, existing ROW, and water features (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

FWS Big Stone National Wildlife Refuge, DNR-listed biodiversity sites, and natural communities (remnant prairie and rock outcroppings) are located within 1,000 feet of the southern terminus of the transmission line and structure removal work area.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

Refer to Morris Route 1 Section 6.1.5.4 for a discussion of the wildlife located within the Northern Glaciated Plains Ecoregion. The proposed transmission line and structure removal area is mostly agricultural land, grassland, wetlands, and urban development, which provides habitat for some common species. A list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

FWS Big Stone National Wildlife Refuge, DNR-listed biodiversity sites, and priority habitats (prairie and rock outcroppings) are located near the southern terminus of transmission line and structure removal Project area. A freshwater mussel sampling site is located near the northern terminus and substation.

Impacts and Mitigation: Natural Environment

Air Quality

Temporary and localized impacts to air quality may occur during removal because of the disturbance of soil which raises fugitive dust particles and construction equipment emissions. Temporary impacts from fugitive dust will be minimized or avoided by using BMPs. Equipment emissions will be localized and only occur during the removal process, no long-term or hot spot effects are anticipated. No additional mitigation is necessary.

Water Quality

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading and construction traffic. However, once the Project is completed, there will be no impact on surface water quality. The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements.

The transmission line and structure removal will enhance wetlands, by eliminating structures from the wetlands. No fill or dredging of the wetlands is necessary. No mitigation is necessary.

Flora and Fauna

The transmission line and structure removal is not anticipated to impact flora and fauna of the project area. No State or Federal holdings or natural communities are anticipated to be impacted. The removal phase of this project may enhance habitat values by removing structures from grasslands and wetlands. See Morris Route 1 Section 6.1.5.5 for a discussion of the overall project impacts on biotic communities.

9.1.2.6 Rare and Unique Natural Resources

Rare and unique natural resources are located within a quarter mile of the southern portion of the transmission line and structure removal area. The rare and unique natural resources near the transmission line and structure removal area include: FWS Big Stone National Wildlife Refuge, DNR-listed biodiversity sites, natural communities (remant prairie, rock outcroppings and a freshwater mussel sampling site), wetlands, Minnesota River, North Fork of the Whetstone River and Big Stone Lake. Table 17 in the Morris Route 1 Section 6.1.6 lists all of the rare or unique resources identified within one mile of Morris Route 1. These resources were identified using the DNR Natural Heritage Database.

9.1.2.7 Impacts and Mitigation: Rare and Unique Natural Resources

No impacts are anticipated to State threatened, State endangered, and Federal candidate species and listed natural communities. See Morris Route 1 Section 6.1.6.1 for a discussion on management of the project near DNR-listed natural communities.

9.2 JOHNSON JUNCTION 230/115 KV SUBSTATION

9.2.1 ASSOCIATED FACILITY DESCRIPTION

The existing Johnson Junction Switch Station is located 25 miles north of Ortonville in the east half of Section 9, Township 124N, Range 45W of Big Stone County. The switch station is owned by GRE. A switch station allows utilities to redirect energy along different portions of the transmission system. This site will be expanded by an area of approximately 400 feet by 400 feet (approximately 3.7 acres) to construct the new substation. To accommodate the new expansion, the Applicants propose to purchase approximately five acres of land to the south of the existing property.

The substation will accommodate the Morris 230 kV transmission line from the Big Stone 230 kV Substation, which will be constructed adjacent to the switch station. The equipment required for the Johnson Junction Substation is identified in Section 3.4.1. Appendix E.1 identifies the existing Johnson Junction Switch Station layout and the proposed expansion area.

9.2.2 ENVIRONMENTAL INFORMATION

9.2.2.1 Human Settlement

Public Health and Safety

Proper safeguards will be implemented for construction and operation of the facility. The Project will be designed to and construction crews will follow local, State, RUS and NESC standards regarding installation of facilities and standard construction practices. Established Applicants and industry safety procedures will be followed during and after installation of the substation.

The proposed substation will be equipped with protective devices, i.e. breakers and relays, where the lines connect to the substation. These devices are designed to safeguard the public if an accident occurs and a transmission line structure or conductor falls to the ground. The protective equipment will de-energize the transmission line should such an event occur. In addition, the substation facility will be fenced, signed, and access limited to authorized personnel.

Commercial, Industrial, Residential Land Use

Zoning information was obtained from Big Stone County. The land proposed for expansion of the existing facility, south of the site, is zoned agricultural (A1 – Agriculture Preservation District). In addition, the site has been classified as Prime Farmland. According to GAP land use information, the existing and proposed sites are cropland, although grasslands exist adjacent to the northwest and southwest corners of the proposed site (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

Displacement

Two residences are located within a quarter mile of the existing substation. One is located approximately 500 feet east and the second is located approximately 1,140 feet north of the site. Johnson is located over one-half mile northeast of the site.

Noise

The proposed substation upgrades or additions at Johnson Junction Switch Station and Morris were modeled to predict the distance to the nighttime L_{50} allowable noise level of 50 dBA for NAC 1 receptors. The noise source levels for each substation were obtained from prospective vendors and compared to the National Electrical Manufacturers Association Standards Publication Number TR 1-1993 (NEMA TR 1) design noise standards. To conservatively predict future noise levels and the distance to the nighttime compliance limit of 50 dBA, the NEMA recommended design noise levels for each transformer were treated as point sources and propagated to the distance where the noise levels would be reduced to 50 dBA, the MPCA nighttime L_{50} noise limit. The minimum distance from the substation transformers to achieve noise levels below 50 dBA at NAC-1 receptors is predicted to be 150 feet from the Johnson Junction Substation and 250 feet from the Morris Substation. The distance to the nearest sensitive receptors, (i.e., residences), is approximately 580 feet from the Johnson Junction Substation and approximately 2,900 feet from the Morris Substation.

Aesthetics

The existing viewshed of the two residences is cultivated land and the existing substation. The residence to the east has constructed a windrow on the north and west sides of the house. This windrow may also serve to block the view of the home from seeing the existing substation. The residence to the north has a direct view of the existing substation.

Socioeconomic

Johnson Junction Substation is located in Big Stone County. Table 10 under the Morris Route 1 Section 6.1.2.6 lists the specific U.S. Census block groups that the route alignment crosses and that are located near the substation. Appendix K.2 displays the locations of the block groups. As can be seen in Table 10, Morris Route 1 Section 6.1.2.6 does not contain populations of disproportionately high minority populations or low-income populations.

Table 11 under the Morris Route 1 Section 6.1.2.6 identifies the top three leading industries in Big Stone County.

Cultural Values

No sites, routes, or areas of cultural significance are located within one mile of the existing and proposed substation areas.

Recreation

No recreational areas and trails are located within the existing and proposed substation areas. One WPA (ID number 10301) is located approximately one mile south of the existing and proposed substation sites. U.S. Highway 75 is located approximately 6 miles west of the substation location.

Public Services

No public services, such as gas, sanitary sewer, potable water, are needed for the proposed substation. Because of the location of this facility, the Applicants do not expect any underground utilities at the site to be impacted by any potential excavation at the site.

Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during the construction and operation of the facility.

Commercial, Industrial, Residential Land Use

Land use will change from the existing agriculture zoning to a land use category typically referred to as an "essential service." This land use category identifies utilities as a conditional use.

Displacement

No displacement is anticipated with the expanded substation.

Noise

Nominal noise impacts are anticipated for the transmission lines and substations. No exceedences of the MPCA noise limits are predicted for the transmission lines, therefore no minimum setback is necessary for compliance with the noise limits at the nearest sensitive receptors. The recommended setback distance for substation noise should be a minimum of 150 feet from the Johnson Junction Substation and 250 feet from the Morris Substation.

Aesthetics

No long-term aesthetics impacts are anticipated from expansion of the existing substation to the south. Most of the impacts will be short-term and limited to those travelers along the section road who are passing the facility. The residence to the east has a treed windrow along the north and west sides of the home and this vegetation feature blocks the view of the substation from the home. It is anticipated that this same windrow will block the view of the expanded substation. The northern residence may not have a view of the expanded substation, depending upon construction techniques. If the facility is expanded south of the existing facility then it should not be visible to the residences, however if the facility is expanded to the west then a portion may be visible beyond the existing facility. Mostly the existing substation will block the view of the expanded substation from the northern residence. Residences over a quarter mile away from the substation are not anticipated to be impacted. Although the substation will be a contrast to surrounding land uses, the Applicants will work with landowners to identify concerns related to the substation and aesthetics.

Socioeconomic

It is anticipated that the substation expansion will occur at the same time as the transmission line construction. See Morris Route 1 Section 6.1.2.10 for a detailed analysis of the socioeconomic impacts. In summary, expansion of the substation will permanently convert approximately five acres of agricultural land to "essential services" land. The landowner will be compensated for the land. Project construction will not cause additional impacts to leading industries within the area.

Cultural Values

No impacts are anticipated, therefore no mitigation is needed.

Recreation

No impacts are anticipated, therefore no mitigation is needed.

Public Services

The Applicants will work with GopherOne Call to locate underground utilities prior to earthwork. No impacts are anticipated, therefore no mitigation is needed.

9.2.2.2 Land-Based Economics

Agriculture

All of the land associated with the Johnson Junction Substation expansion is used for agriculture (USGS 2004), and the Hamerly-Lindaas Complex soils are listed by the NRCS as prime farmland (USDA, NRCS 2005).

There are no central-pivot irrigation systems are located on the Johnson Junction Substation expansion area.

Forestry

There are no forested parcels located within one mile of the Johnson Junction Substation. The primary tree cover in the project area is associated with homesteads and woodrows. No economically important forest resources are within the project area.

Tourism

No tourism features are associated with the Johnson Junction Substation and expansion areas. Refer to Morris Route 1 Section 6.1.3.3 for a discussion of tourism associated with the Project area in Big Stone County.

Mining

No mining areas are associated with the Johnson Junction Substation and expansion areas. Refer to Morris Route 1 Section 6.1.3.4 for a discussion of mining associated with the transmission line project area in Big Stone County.

Impacts and Mitigation: Land-Based Economies

Agriculture

The substation expansion will result in permanent impacts to farmland. Permanent impacts will occur as a result of grading, site preparation, and substation construction along the transmission line route. The Applicants estimate permanent impacts to agricultural lands at approximately five acres south or east of the existing switch station. The permanent impacts to agricultural lands will occur on prime farmland soils.

No impacts to central pivot irrigation are expected in association with the substation expansion.

Forestry

No economically important forest resources are located within the proposed expansion areas. No impacts to trees associated with residences or woodrows are anticipated to occur with expansion of the substation.

9.2.2.3 Archaeological and Historic Resources

The Applicants sponsored overviews of known archaeological and historic resources (archaeological resources and historic standing structures) within the corridors (Palmer et al. 2005a, 2005b, 2005c). Section 6.1.4 of the Morris Route 1 provides results of the archival review of previously recorded archaeological and historic resources and general information on the research methodology applied to the archival review. Detailed descriptions of these resources can be found in archaeological and historic resources overviews prepared by Palmer et al. (2005a, 2005b, 2005c).

9.2.2.4 Impacts and Mitigation: Archaeological and Historic Resources

No known archaeological resources are within the substation expansion area; 3 architectural resources are located within one mile of the transmission line in Johnson. However, as Section 6.1.4.3 of Morris Route 1 explains construction of new transmission line facilities could impact previously identified and currently unknown archaeological and historic resources. The realized potential impacts will be determined once routes are selected within the proposed corridors. Refer to Section 6.1.4.3 for a discussion of project-related archaeological and historic resources compliance measures and management, these same procedures will occur on the substation expansion area if the route is selected.

9.2.2.5 Natural Environment

Air Quality

Refer to Morris Route 1 Section 6.1.5.1 for a discussion of existing climate and air quality conditions.

Water Quality and Wetlands

Refer to Morris Route 1 Section 6.1.5.2 for a discussion of existing water quality conditions.

The major surface water features within one mile of the existing and proposed substation areas are NWI identified wetlands. Fourteen NWI basins are located within a quarter-mile radius of the substation expansion area. The number and type of NWI wetlands near the proposed substation are shown in Table 15. The wetlands identified on the NWI maps do not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act.

TABLE 76
WETLANDS WITHIN A QUARTER MILE OF THE SUBSTATION

Type of Wetland (Cowardin et al. type)	Number of Basins
palustrine emergent – drained (PEMAd)	8
palustrine emergent (PEMA & PEMC)	4
palustrine unconsolidated bottom – excavated (PUBFx)	2

No PWI stream, ditch, or wetlands are located within one mile of the Johnson Junction Substation expansion area.

Flora

The Johnson Junction Switch Station and proposed substation areas are found in the Northern Glaciated Plains Ecoregion. Refer to Morris Route 1 Section 6.1.5.3 for a discussion of native vegetation located within the Northern Glaciated Plains Ecoregion. Due to settlement and farming in the 1800s, the present switch station and surrounding area has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays)*, soybeans (*Glycine max)* and wheat (*Triticum aesitivum)*; in the grazed areas, dominant vegetation would include grasses such as smooth brome (*Bromus inermis)* and sorghum (*Sorghum vulgare)*.

The GAP land cover data classifies the existing and proposed substation areas as cropland, although grassland polygons are located adjacent to the northwest and southwest of the proposed site (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

No DNR WMAs, FWS WPAs, and/or State or Federal holdings are located within one mile of the substation expansion area. Although one WPA (10301) is located approximately one mile south of the proposed substation expansion area.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

Refer to Morris Route 1 Section 6.1.5.4 for a discussion of the wildlife located within the Northern Glaciated Plains Ecoregion. The proposed substation expansion area is agricultural land, which provides habitat for some common species, a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

No WMAs, WPAs, Wildlife Refuges, priority habitats (grasslands and wetlands), or rookeries are located near the substation project area.

Impacts and Mitigation: Natural Environment

Air Quality

Temporary and localized impacts to air quality may occur during construction due to the disturbance of soil which raises fugitive dust particles. Temporary impacts from fugitive dust will be minimized or avoided by using BMPs. No additional mitigation is necessary.

Water Quality

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading and construction traffic. However, once the Project is completed, it will have no impact on surface water quality. The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements.

Flora and Fauna

The substation expansion is not anticipated to impact flora and fauna of the project area. See Morris Route 1 Section 6.1.5.5 for a discussion of the overall project impacts on biotic communities.

9.2.2.6 Rare and Unique Natural Resources

No rare and unique natural resources are located within one mile of the substation expansion area. Table 17 in the Morris Route 1 Section 6.1.6 lists the rare or unique resources identified within one mile of Morris Route 1. These resources were identified using the DNR Natural Heritage Database.

9.2.2.7 Impacts and Mitigation: Rare and Unique Natural Resources

No impacts are anticipated to State threatened, State endangered, and Federal candidate species and listed natural communities. See Morris Route 1 Section 6.1.6.1 for a discussion on management of the project near DNR-listed natural communities.

9.3 MORRIS SUBSTATION

9.3.1 ASSOCIATED FACILITY DESCRIPTION

The existing Morris 230 kV Substation is located west of Morris in the NE ¼ of the NE ¼ of Section 2, Township 124N, Range 43W in Stevens County. The planned modifications include a new, larger transformer, which is described in Section 3.4.2. No site expansion is anticipated. The Morris 230 kV Substation is owned and operated by Western, and any modifications to this station are within their jurisdiction.

9.4 CANBY SUBSTATION

9.4.1 ASSOCIATED FACILITY DESCRIPTION

The existing Canby 115/41.6 kV Substation is located north of Canby in the SW ¼ and NW ¼ of Section 25, Township 115, Range 45, in Yellow Medicine County. The Canby Substation is owned and operated by Otter Tail. The modifications are detailed in Section 3.4.3.

These modifications will require that the site be expanded to the south or east of the existing facility. The expansion is estimated at approximately 500 feet by 550 feet (6.3 acres) and will require grading and installation of concrete footings and a gravel pad. The Applicants proposed to purchase approximately eight acres of land to accommodate this expansion. Appendix E.3 identifies the existing Canby Substation layout and the proposed expansion area.

9.4.2 ENVIRONMENTAL INFORMATION

9.4.2.1 Human Settlement

Public Health and Safety

See Section 8.2.2.1 for a general discussion of public health and safety in the area.

Commercial, Industrial, Residential Land Use

Zoning information was obtained from Yellow Medicine County. The land proposed for substation modification, either south or east of the existing site, is zoned agricultural. In addition, the area has been zoned as Rural Preservation. According to GAP land use information, the proposed sites are cropland, whereas grasslands are characterized on the existing substation site (USGS 2004, Upper Midwest GAP Analysis Program Landcover Data).

Displacement

Four residences are located within one-mile of the existing substation. The closest residence is approximately 1,500 feet from the existing substation and 1,200 feet from the proposed site on the south side of the existing substation. The three other residences are over one-half mile away from the existing and proposed substation sites.

Noise

The proposed substation upgrades at Canby and Granite Falls were modeled to predict the distance to the nighttime L50 allowable noise level of 50 dBA for NAC 1 receptors. The noise source levels for each substation were obtained from prospective vendors and compared to the National Electrical Manufacturers Association Standards Publication Number TR 1-1993 (NEMA TR 1) design noise standards. To conservatively predict future noise levels and the distance to the nighttime compliance limit of 50 dBA, the NEMA recommended design noise levels for each transformer were treated as point sources and propagated to the distance where the noise levels would be reduced to 50 dBA. The minimum distance from the substation transformers to achieve noise levels below 50 dBA at NAC-1 receptors is predicted to be 300 feet from the Canby Substation and 350 feet from the Granite Falls Substation. The distance to the nearest sensitive receptors, (i.e., residences), is approximately 1500 feet from the Canby Substation and approximately 1,800 feet from the Granite Falls Substation.

Aesthetics

The existing viewshed of the four residences and travelers along U.S. Highway 75 is cultivated land and the existing substation. Residences to the south (closest to the project area), north, and east have windrows or vegetation on the north, south, and west (respectively) sides of the houses. These windrows may also serve to block the view from the home to the existing substation. The residence to the west, and U.S. Highway 75 travelers, have a direct view of the existing substation.

Socioeconomic

Canby Substation is located in Yellow Medicine County. Table 46 under the Granite Falls Routes 1 and 3 Section 8.1.2.6 lists the specific U.S. Census block groups that the route alignment crosses and that are located near the substation. Appendix K.2 displays the locations of the block groups. As can be seen in Table 46, Granite Falls Routes 1 and 3 Section 8.1.2.6 does not contain populations of disproportionately high minority populations or low-income populations.

Table 47 under the Granite Falls Routes 1 and 3 Section 8.1.2.6 identifies the top three leading industries in Yellow Medicine County.

Cultural Values

No sites, routes, or areas of cultural significance are located within one mile of the existing and proposed substation areas.

Recreation

No designated recreational areas and trails are located within the existing and proposed substation areas. U.S. Highway 75 is located adjacent to and west of the substation.

Public Services

No public services, such as gas, sanitary sewer, potable water, are needed for the proposed substation. Site grading is expected to occur at the proposed site with minimal excavation anticipated, therefore impacts to potential underground utilities is not expected to occur.

Impacts and Mitigation: Human Settlement

Public Health and Safety

See Section 8.1.2.10 for potential impacts and mitigation measures in the area.

Commercial, Industrial, Residential Land Use

Land use will change from the existing agriculture zoning to a land use category typically referred to as an "essential service." This land use category identifies utilities as a conditional use.

Displacement

No displacement is anticipated with the modified substation.

Noise

Nominal noise impacts are anticipated for the Granite Falls Routes and Canby and Granite Falls substations. No exceedences of the MPCA noise limits are predicted for the transmission lines, therefore no minimum setback is necessary for compliance with the noise limits at the nearest sensitive receptors. The recommended setback distance for substation noise should be a minimum of 300 feet from the Canby Substation and 350 feet from the Granite Falls Substation.

Aesthetics

No long-term aesthetic impacts are anticipated from modification of the existing substation to the south and east. Most of the impacts will be minor and limited to those travelers along U.S. Highway 75 who are passing the facility. The residences to the south, north, and east have a treed windrow along the north, south, and west sides of the home and this vegetation feature blocks the view of the substation from the home. It is anticipated that this same windrow will block the view of the expanded substation. The western residence may not have a view of the expanded substation, depending upon construction techniques. If the substation is expanded east of the existing facility then the existing facility would block the view of the expanded substation. However if the facility is expanded to the south then a portion may be visible beyond the existing facility. The residences over one-half mile away from the substation are not anticipated to be impacted. Although the transmission line will be a contrast to surrounding land uses, the Applicants will work with landowners to identify concerns related to the substation and aesthetics.

Socioeconomic

It is anticipated that the substation expansion will occur at the same time as the transmission line construction. See Granite Falls Routes 1 and 3 Section 8.1.2.10 for a detailed analysis of the socioeconomic impacts. In summary, expansion of the substation will permanently convert approximately eight acres of agricultural land to "essential services" land. The landowner will be compensated for the land. Project construction will not cause additional impacts to leading industries within the area.

Cultural Values

No impacts are anticipated, therefore no mitigation is needed.

Recreation

No impacts are anticipated to U.S. Highway 75, therefore no mitigation is needed.

Public Services
The Applicants will work with GopherOne Call to locate underground utilities prior to earthwork. No impacts are anticipated, therefore no mitigation is needed.

9.4.2.2 Land-Based Economics

Agriculture

All of the land associated with the Canby substation modification is used for agriculture (USGS 2004), and the Burr-Calco Complex soils are listed by the NRCS as prime farmland (USDA, NRCS 2005).

There are no central-pivot irrigation systems are located within either of the Canby substation expansion areas.

Forestry

There are no forested parcels are located within one mile of the Canby substation. The primary tree cover in the project area is associated with homesteads and woodrows. No economically important forestry resources are within the project area.

Tourism

U.S. Highway 75 is classified by the State of Minnesota (http://www.dot.state.mn.us/environment/scenic_byways/index.html) and Federal Highway Administration (http://www.byways.org/) as a scenic byway call Kings of Trails Scenic Byway. The Byway stretches from the Gulf of Mexico to Canada. Refer to Granite Falls Routes 1 and 3 Section 8.1.3.3 for a discussion of tourism associated with the Project area in Yellow Medicine County.

Mining

No mining areas are associated with the Canby Substation and substation expansion areas. Refer to Granite Falls Routes 1 and 3 Section 8.1.3.4 for a discussion of mining associated with the Project area in Yellow Medicine County.

Impacts and Mitigation: Land-Based Economies

Agriculture
The substation expansion will result in permanent impacts to farmland. Permanent impacts will occur as a result of grading, site preparation, and substation construction along the transmission line route. The Applicants estimate permanent impacts to agricultural lands at approximately eight acres

south or east of the existing substation. The permanent impacts to agricultural lands will occur on prime farmland soils.

No impacts to central pivot irrigation are expected in association with the substation expansion.

Forestry

No economically important forestry resources are located within the proposed expansion areas. No impacts to trees associated with residences or woodrows are anticipated to occur with expansion of the substation

9.4.2.3 Archaeological and Historic Resources

The Applicants have conducted overviews of known archaeological and historic resources (archaeological resources and historic standing structures) within the corridors (Palmer et al. 2005a, 2005b, 2005c). Section 8.1.4 of the Granite Falls Routes 1 and 3 provides results of the archival review of previously-recorded archaeological and historic resources. Section 6.1.4 of the Morris Route 1 provides general information on the research methodology applied to the archival review. Detailed descriptions of these resources can be found in archaeological and historic resources overviews prepared by Palmer et al. (2005a, 2005b, 2005c).

9.4.2.4 Impacts and Mitigation: Archaeological and Historic Resources

No known archaeological and historic resources and/or historic standing structures are within the substation expansion area. However, as Section 6.1.4.3 of Morris Route 1 explains construction of new transmission line facilities could impact previously identified and currently unknown archaeological and historic resources. The realized potential impacts will be determined once routes are selected within the proposed corridors. Refer to Section 6.1.4.3 for a discussion of project-related archaeological and historic resources compliance measures and management, these same procedures will occur on the substation expansion area if the route is selected.

9.4.2.5 Natural Environment

Air Quality

Refer to Morris Route 1 Section 6.1.5.1 for a discussion of existing climate and air quality conditions.

Water Quality and Wetlands

Refer to Granite Falls Routes 1 and 3 Section 7.1.5.2 for a discussion of existing water quality conditions.

The major surface water features within one mile of the existing and proposed substation areas is Yellow Medicine County Ditch number 8 (a PWI identified stream – ID number 105673) and an intermittent unnamed stream. Yellow Medicine County Ditch number 8 is a ditched portion of the Canby Creek. This is located approximately 2,000 feet west of the Project area. The intermittent unnamed stream runs along the east side of the existing substation, in between the two fields and then south through the field. One NWI wetland basin is located within one mile radius of the substation expansion area. This NWI basin is over one-half mile northeast of the expansion area. It is typed as a palustrine emergent (PEMC). The wetland identified on the NWI map does not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act.

The Canby Substation and substation expansion areas are located within a 100-year floodplain, but not the floodway.

Flora

The Canby Substation and proposed substation areas are located in the Northern Glaciated Plains Ecoregion. Refer to Morris Route 1 Section 6.1.5.3 for a discussion of native vegetation located within the Northern Glaciated Plains Ecoregion. Due to settlement and farming in the 1800s, the present substation and surrounding area has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays)*, soybeans (*Glycine max)* and wheat (*Triticum aesitivum)*; in the grazed areas, dominant vegetation would include grasses such as smooth brome (*Bromus inermis)* and sorghum (*Sorghum vulgare)*.

The GAP land cover data classifies the proposed substation areas as cropland and grassland on the existing substation (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

No DNR WMAs, FWS WPAs, and/or State or Federal holdings (Section 8.1.5.3) are located within one mile of the substation expansion area. The Reserve WMA is located approximately one and a half miles to the southeast of the proposed expansion areas.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

Refer to Granite Falls Routes 1 and 3 Section 8.1.5.4 for a discussion of the wildlife located within the Northern Glaciated Plains Ecoregion. The proposed substation expansion area is agricultural land, which provides habitat from some common species, a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

No WMAs, WPAs, Wildlife Refuges, priority habitats (grasslands and wetlands), or rookeries are located near the substation project area.

Impacts and Mitigation: Natural Environment

Air Quality

Temporary and localized impacts to air quality may occur during construction due to the disturbance of soil which raises fugitive dust particles. Temporary impacts from fugitive dust will be minimized or avoided by using BMPs. No additional mitigation is necessary.

Water Quality

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading and construction traffic. However, once the Project is completed, it will have no impact on surface water quality. The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements.

Depending upon floodplain and site topography, filling approximately eight acres of the 100-year floodplain may occur as a result of substation modifications. Development within the flood fringe is dependent upon DNR and County zoning. Under statewide floodplain management standards, local communities can designate areas for development in the floodplain, called flood fringe areas, which would cumulatively cause no more than a half-foot (six inches) stage increase in the 100-year flood. A lesser stage increase than half-foot (six inches) would be appropriate where filling/development of proposed flood fringe areas would increase flood damage potential to nearby properties.

Development is normally allowed in the flood fringe provided that the structure is placed on fill so that the lowest floor (including basements) is above the flood protection elevation. Yellow Medicine County has zoned the project area as Floodplain A with a floodplain elevation of approximately 1,163 feet. An engineer/surveyor will evaluate the proposed building site and furnish local officials with the necessary data to determine the property's flood protection elevation and whether the proposed structure is in the floodway.

The flood protection elevation refers to an elevation one foot above the 100-year flood plus any stage increase due to the designation of flood fringe areas. The elevation of the lowest floor of a dwelling must be at or above the flood protection elevation. Local regulations will also require the top of the access road elevations to be within two feet of the flood protection elevation.

Currently FEMA has proposed new flood maps for Yellow Medicine County (conversation with the County Zoning). These new maps may change the floodplain designation for the project area. The Applicants will work with the DNR and County to determine the proper flood designation and, if necessary, the flood protection elevation.

Flora and Fauna

The substation expansion is not anticipated to impact flora and fauna of the project area. See Granite Falls Routes 1 and 3 Section 8.1.5.5 for a discussion of the overall project impacts on biotic communities.

9.4.2.6 Rare and Unique Natural Resources

No rare and unique natural resources are located within one mile of the substation expansion area. Table 67 and 68 in the Granite Falls Routes 1 and 3 Section 7.1.6 lists the rare or unique resources identified within one mile of the Granite Falls Routes 1 and 3. These resources were identified using the DNR Natural Heritage Database.

9.4.2.7 Impacts and Mitigation: Rare and Unique Natural Resources

No impacts are anticipated to State and Federal threatened, endangered, and candidate species and listed natural communities. See Granite Falls Routes 1 and 3 Section 7.1.6.1 for a discussion on management of the project near DNR-listed natural communities.

9.5 GRANITE FALLS SUBSTATION

9.5.1 ASSOCIATED FACILITY DESCRIPTION

The existing Granite Falls 230 kV Substation is located north of Granite Falls in the SW ¼ of the NE ¼ of Section 28, Township 116N, Range 39W. The Granite Falls 230 kV Substation is owned and operated by Western. The planned modifications include a new, larger transformer, which is described in Section 3.4.2. No site expansion is anticipated. The Morris 230 kV Substation is owned and operated by Western, and any modifications to this station are within their jurisdiction.

9.5.2 ENVIRONMENTAL INFORMATION

No impacts are anticipated to land-based economies, archaeological and historic resources, natural environment and rare and unique resources.

9.5.2.1 Human Settlement

Noise

The proposed substation upgrades at Canby and Granite Falls were modeled to predict the distance to the nighttime L50 allowable noise level of 50 dBA for NAC 1 receptors. The noise source levels for each substation were obtained from prospective vendors and compared to the National Electrical Manufacturers Association Standards Publication Number TR 1-1993 (NEMA TR 1) design noise standards. To conservatively predict future noise levels and the distance to the nighttime compliance limit of 50 dBA, the NEMA recommended design noise levels for each transformer were treated as point sources and propagated to the distance where the noise levels would be reduced to 50 dBA. The minimum distance from the substation transformers to achieve noise levels below 50 dBA at NAC-1 receptors is predicted to be 300 feet from the Canby Substation and 350 feet from the Granite Falls Substation. The distance to the nearest sensitive receptors (i.e., residences) is approximately 1,500 feet from the Canby Substation and approximately 1,800 feet from the Granite Falls Substation.

Nominal noise impacts are anticipated for the Granite Falls Routes and Canby and Granite Falls substations. No exceedences of the MPCA noise limits are predicted for the transmission lines, therefore no minimum setback is necessary for compliance with the noise limits at the nearest sensitive receptors. The recommended setback distance for substation noise should be a minimum of 300 feet from the Canby Substation and 350 feet from the Granite Falls Substation.

<u>**SYSTEM ALTERNATIVE 2**</u>

9.6 WILLMAR SUBSTATION

9.6.1 ASSOCIATED FACILITY DESCRIPTION

The existing Willmar 230 kV Substation is located in Willmar in the SE ¼ of the SW ¼ of Section 27, Township 119N, Range 35W, in Kandiyohi County. The City of Willmar and GRE currently share ownership of this facility are identified in Section 3.4.3.

These modifications will require that the site be expanded to the northwest of the facility. The expansion is estimated at approximately 250 feet by 250 feet (1.4 acres) and will require grading and installation of concrete footings and a gravel pad. Approximately three acres of land will be purchased for the proposed expansion. Appendix E.2 identifies the existing Willmar Substation layout and the proposed expansion area.

9.6.2 ENVIRONMENTAL INFORMATION

9.6.2.1 Human Settlement

<u>**Public Health and Safety**</u>

See Section 8.3.2.1

<u>**Commercial, Industrial, Residential Land Use**</u>

Zoning information was obtained from Kandiyohi County and the City of Willmar. The substation project area is located on the border of the Kandiyohi County and City of Willmar zoning jurisdictions. Kandiyohi County has the area zoned as Agricultural Preservation (A-1) and Willmar has the area zoned as General Business (GB). The land proposed for substation modification, northwest of the existing site, is zoned agricultural. According to GAP land use information, the proposed expansion area is cropland, whereas grasslands are characterized on the existing substation site (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

<u>**Displacement**</u>

Ten residences are located within one-mile of the existing substation. Two residences are approximately one-half mile away from the existing and proposed substation sites. The closest residence is approximately 2,300 feet from the existing substation and proposed modification site.

Noise

The proposed substation upgrades at Willmar were modeled to predict the distance to the nighttime L50 allowable noise level of 50 dBA for NAC 1 receptors. The noise source levels for each substation were obtained from prospective vendors and compared to the National Electrical Manufacturers Association Standards Publication Number TR 1-1993 (NEMA TR 1) design noise standards. To conservatively predict future noise levels and the distance to the nighttime compliance limit of 50 dBA, the NEMA recommended design noise levels for each transformer were treated as point sources and propagated to the distance where the noise levels would be reduced to 50 dBA, the MPCA nighttime L50 noise limit. The minimum distance from the substation transformers to achieve noise levels below 50 dBA at NAC-1 receptors is predicted to be 300 feet from the Willmar Substation. The distance to the nearest sensitive receptors, (i.e., residences), is approximately 2,300 feet from the Willmar Substation.

Nominal noise impacts are anticipated for the transmission lines and substation for Willmar route options. No exceedences of the MPCA noise limits are predicted for the transmission lines, therefore no minimum setback is necessary for compliance with the noise limits at the nearest sensitive receptors. The recommended setback distance for substation noise should be a minimum of 300 feet.

Aesthetics

The existing viewshed of the residences and travelers along County Road 88 (45^{th} Avenue SW) is cultivated land, development from the City of Willmar and the existing substation. Residences to the southwest (closest to the project area) and west have windrows or mature trees surrounding a majority of their homes. These windrows may also serve to block the view of the home from seeing the existing substation. The residence to the south and travelers along County Road 88 have a direct view of the existing substation.

Socioeconomic

Willmar Substation is located in Kandiyohi County. Section 7.1.2.6 lists the specific U.S. Census block groups that the route alignment crosses and that are located near the substation. As can be seen in Section 7.1.2.6 the area does not contain populations of disproportionately high minority populations or low-income populations.

Section 7.1.2.6 identifies the top three leading industries in Kandiyohi County.

Cultural Values

No sites, routes, or areas of cultural significance are located within one mile of the existing and proposed substation areas.

Recreation

No designated recreational areas and trails are located within the existing and proposed substation areas. As Section 7.1.3.6 explains, the Minnesota River Valley Birding Trail Kandiyohi Lakes Regional Loop is along U.S. Highway 71 in Willmar, within half one mile of the substation modification area (Audubon Minnesota 2005).

Public Services

No public services, such as gas, sanitary sewer, potable water, are needed for the proposed substation. Site grading is expected to occur at the proposed site with minimal excavation anticipated, therefore impacts to potential underground utilities are not expected to occur.

Impacts and Mitigation: Human Settlement

Public Health and Safety

See Section 7.3.2.1 for potential impacts and mitigation measures related to public health and safety in this area.

Commercial, Industrial, Residential Land Use

Land use will change from the existing agriculture zoning to a land use category typically referred to as an "essential service." This land use category identifies utilities as a conditional use.

Displacement

No displacement is anticipated with the modified substation.

Noise

Nominal noise impacts are anticipated for the transmission lines and substation for Willmar route options. No exceedences of the MPCA noise limits are predicted for the transmission lines, therefore no minimum setback is necessary for compliance with the noise limits at the nearest sensitive receptors. The recommended setback distance for substation noise should be a minimum of 300 feet.

Aesthetics

No long-term aesthetic impacts are anticipated from modification of the existing substation. Most of the impacts will be minor and limited to the southern residence and travelers along County Road 88 who are passing the facility. The impact is considered minor because the expanded substation will not block the view of an environmental or cultural feature, plus there currently is a substation in the viewshed. The residences to the southwest and west have a treed windrow that would block the view of the substation from the home. It is anticipated that this same windrow will block the view of the expanded substation. The residences over one-half mile away from the substation are not anticipated to be impacted. Although the transmission line will be a contrast to surrounding land uses, the Applicants will work with landowners to identify concerns related to the substation and aesthetics.

Socioeconomic

It is anticipated that construction of the substation expansion will occur at the same time as the transmission line construction. See Willmar Route 1 Section 6.1.2.10 for a detailed analysis of the socioeconomic impacts. In summary, expansion of the substation will permanently convert approximately 1.5 acres of agricultural land to "essential services" land. The landowner will be compensated for the land. Project construction will not cause additional impacts to leading industries within the area.

Cultural Values

No impacts are anticipated, therefore no mitigation is needed.

Recreation

No impacts are anticipated, therefore no mitigation is needed.

Public Services

The Applicants will work with GopherOne Call to locate underground utilities prior to earthwork. No impacts are anticipated, therefore no mitigation is needed.

9.6.2.2 Land-Based Economics

Agriculture

All of the land associated with the Willmar substation modification is used for agriculture (USGS 2004), and the Harps-Seaforth-Okoboji Complex, Okoboji Silty Clay Loam, and Harpster Silty Clay Loam soils in the project area are listed by the NRCS as prime farmland (USDA, NRCS 2005).

There are no central-pivot irrigation systems located within the Willmar substation expansion area.

Forestry

There are no forested parcels located within one mile of the Willmar Substation. The primary tree cover in the project area is associated with homesteads and woodrows. No economically important forestry resources are within the project area.

Tourism

No tourism attractions are associated with the Willmar substation and substation expansion area. Refer to Willmar Route 1 Section 6.1.3.3 for a discussion of tourism associated with the Project area in Kandiyohi County.

Mining

No mining areas are associated with the Willmar Substation and substation expansion areas. Refer to Willmar Route 1 Section 6.1.3.4 for a discussion of mining associated with the Project area in Kandiyohi County.

Impacts and Mitigation: Land-Based Economies

Agriculture

The substation expansion will result in permanent impacts to farmland. Permanent impacts will occur as a result of grading, site preparation, and substation construction along the transmission line route. The Applicants estimate permanent impacts to agricultural lands at approximately one and a half acres northwest of the existing substation. The permanent impacts to agricultural lands will occur on prime farmland soils.

No impacts to central pivot irrigation are expected in association with the substation expansion.

Forestry

No economically important forestry resources are located within the proposed expansion areas. No impacts to trees associated with residences or woodrows are anticipated to occur with expansion of the substation

9.6.2.3 Archaeological and Historic Resources

The Applicants have conducted overviews of known archaeological and historic resources (archaeological resources and historic standing structures) within the corridors (Palmer et al. 2005a, 2005b, 2005c). Section 7.1.4 of Willmar Route 1 provides results of the archival review of previously recorded archaeological and historic resources. Section 6.1.4 of Morris Route 1 provides general information on the research methodology applied to the archival review. Detailed descriptions of these resources can be found in archaeological and historic resources overviews prepared by Palmer et al. (2005a, 2005b, 2005c).

9.6.2.4 Impacts and Mitigation: Archaeological and Historic Resources

No known archaeological resources and/or historic standing structures are within the substation expansion area. However, as Section 6.1.4.3 of Morris Route 1 explains construction of new transmission line facilities could impact previously identified and currently unknown archaeological and historic resources. The realized potential impacts will be determined once routes are selected within the proposed corridors. Refer to Section 6.1.5 for a discussion of project-related archaeological and historic resources compliance measures and management, these same procedures will occur on the substation expansion area if the route is selected.

9.6.2.5 Natural Environment

Air Quality

Refer to Morris Route 1 Section 6.1.5.1 for a discussion of existing climate and air quality conditions.

Water Quality and Wetlands

Refer to Willmar Route 1 Section 6.1.5.2 for a discussion of existing water quality conditions.

The major surface water features within one mile of the existing and proposed substation areas are the various unmapped wetlands and two ditches. Both ditches are located over a half mile from the Willmar Substation; one is north and the other is east of the substation. The unmapped wetlands appear to be palustrine emergent (PEMA and PEMC) basins and are located north and east of the existing substation. One NWI wetland basin is located within a quarter-mile radius of the substation expansion area. The basin is typed as a palustrine shrub (PSSC1) and palustrine emergent (PEMC). The wetland identified on the NWI map does not necessarily represent the actual wetlands subject to protection under Section 404 of the Clean Water Act and under the Minnesota Wetland Conservation Act.

No PWI stream, ditch, or wetlands are located within one mile of the Johnson Junction Substation expansion area.

Flora

The Willmar Substation and proposed substation area is found in the Northern Glaciated Plains Ecoregion. Refer to Morris Route 1 Section 6.1.5.3 for a discussion of native vegetation located within the Northern Glaciated Plains Ecoregion. Due to settlement and farming in the 1800s, the present substation and surrounding area has been converted to agriculture. The dominant plant species in the agriculture areas are corn (*Zea mays)*, soybeans (*Glycine max)* and wheat (*Triticum aesitivum)*; in the grazed areas, dominant vegetation would include grasses such as smooth brome (*Bromus inermis)* and sorghum (*Sorghum vulgare)*.

The GAP land cover data classifies the proposed substation area as cropland. Grassland is categorized on the existing substation (Source: USGS, 2004. Upper Midwest GAP Analysis Program Landcover Data).

No DNR WMAs, FWS WPAs, and/or State or Federal holdings (Morris Route 1 Section 6.1.5.3) are located within one mile of the substation expansion area. Schueler WPA is over two miles south of the Willmar substation and it is the closest.

As stated in Section 6.1.5.5, the Applicants will attempt to avoid native flora and will work to minimize and avoid impacts. 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.

Fauna

Refer to Willmar Route 1 Section 6.1.5.4 for a discussion of the wildlife located within the Northern Glaciated Plains Ecoregion. The proposed substation expansion area is agricultural land, which provides habitat for some common species, a list of species known to occur in habitats of this region of Minnesota is included as Appendix M.2.

No WMAs, WPAs, Wildlife Refuges, priority habitats (grasslands and wetlands), or rookeries are located near the substation modification area.

Impacts and Mitigation: Natural Environment

Air Quality

Temporary and localized impacts to air quality may occur during construction due to the disturbance of soil which raises fugitive dust particles. Temporary impacts from fugitive dust will be minimized or avoided by using BMPs. No additional mitigation is necessary.

Water Quality

During construction there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading and construction traffic. However, once the Project is completed, it will have no impact on surface water quality. The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements.

Flora and Fauna

The substation modification is not anticipated to impact flora and fauna of the project area. See Willmar Route 1 Section 7.1.5.5 for a discussion of the overall project impacts on biotic communities.

9.6.2.6 Rare and Unique Natural Resources

No rare and unique natural resources are located within one mile of the substation expansion area. Section 7.1.6 lists the rare or unique resources identified within one mile of Willmar Route 1. These resources were identified using the DNR Natural Heritage Database.

9.6.2.7 Impacts and Mitigation: Rare and Unique Natural Resources

No impacts are anticipated to State and Federal threatened, endangered, and candidate species and listed natural communities. See Willmar Route 1 Section 7.1.6.1 for a discussion on management of the project near DNR-listed natural communities.

9.7 CANBY SUBSTATION

See Section 9.4 above.

9.8 GRANITE FALLS SUBSTATION

See Section 9.5 above.

9.9 MORRIS 115 KV TRANSMISSION LINE REBUILD

9.9.1 ENVIRONMENTAL INFORMATION

9.9.1.1 Human Settlement

Public Health and Safety

See Sections 6.1.2.1 and 9.1.2.1 for a general discussion of public health and safety along the Morris 115 kV transmission line rebuild.

Commercial, Industrial and Residential Land Use

See Sections 6.1.2.2 and 9.1.2.1 for a general discussion of commercial, industrial and residential land use along the Morris 115 kV transmission line rebuild.

Displacement

See Sections 6.1.2.3 and 9.1.2.1 for a general discussion of displacement along the Morris 115 kV transmission line rebuild.

Noise

See Sections 6.1.2.4 and 9.1.2.1 for a general discussion of noise along the Morris 115 kV transmission line rebuild.

Aesthetics

See Sections 6.1.2.5 and 9.1.2.1 for a general discussion of aesthetics along the Morris 115 kV transmission line rebuild.

Socioeconomic

See Sections 6.1.2.6 and 9.1.2.1 for a general discussion of socioeconomics along the Morris 115 kV transmission line rebuild.

Cultural Values

See Sections 6.1.2.7 and 9.1.2.1 for a general discussion of cultural values along the Morris 115 kV transmission line rebuild.

Recreation

See Sections 6.1.2.8 and 9.1.2.1 for a general discussion of recreation along the Morris 115 kV transmission line rebuild.

Public Services

See Sections 6.1.2.9 and 9.1.2.1 for a general discussion of public services along the Morris 115 kV transmission line rebuild.

Impacts and Mitigation: Human Settlement

Public Health and Safety

The Applicants will ensure that safety requirements are met during construction of the transmission line.

Commercial, Industrial and Residential Land Use

Since the majority of the land use is agricultural, and since agricultural activities will be allowed beneath the transmission line (with the exception of the immediate vicinity of the structure locations), impacts will be minimal and no mitigation is anticipated.

Coordination with local government representatives would likely be necessary to address any conflicts between the route and the proposed new runway approach safety zones for the Ortonville Munitipal Airport.

Displacement

No displacement is anticipated with the removal project.

Noise

Noise impacts from the rebuilt transmission line will be nominal. It is not anticipated that audible noise levels for the transmission line will exceed the MPCA daytime and nighttime noise limits at the nearest sensitive receptors. The audible noise is predicted to be similar to Morris Route 1 (Section 6.1.2.10).

Aesthetics

The rebuilt line will follow the existing 115 kV ROW and have similar structures. No change to the existing aesthetics is anticipated.

Socioeconomic

See Section 6.1.2.10 for potential impacts and mitigation measures related to socioeconomic resources along the Morris 115 kV transmission line rebuild.

Cultural Values

No impacts are anticipated, therefore no mitigation is needed (Section 6.1.2.10).

Recreation

No impacts are anticipated, therefore no mitigation is needed.

Public Services

The Applicants will work with GopherOne Call to locate underground utilities prior to earthwork. No impacts are anticipated, therefore no mitigation is needed.

9.9.1.2 Land-Based Economics

Agriculture

See Sections 6.1.3.1 and 9.1.2.2 for a general discussion of agriculture along the Morris 115 kV transmission line rebuild.

Forestry

See Sections 6.1.3.2 and 9.1.2.2 for a general discussion of forestry along the Morris 115 kV transmission line rebuild.

Tourism

See Sections 6.1.3.3 and 9.1.2.2 for a general discussion of tourism along the Morris 115 kV transmission line rebuild.

Mining

See Sections 6.1.3.4 and 9.1.2.2 for a general discussion of mining along the Morris 115 kV transmission line rebuild.

Impacts and Mitigation: Land-Based Economies

Agriculture

The Project will follow the footprint of the existing transmission line. There are no additional permanent impacts to farmland anticipated. During construction, temporary impacts, such as soil compaction and crop damages within the ROW, are likely to occur. The Applicants estimate that approximately 276 acres of agricultural land may be impacted temporarily by the Morris 115 kV transmission line rebuild due to transmission line construction. Staging areas and stringing set up areas will also temporarily impact land along the route and are estimated at approximately 9.0 acres.

No impacts to central pivot irrigation are expected along the Morris 115 kV transmission line rebuild. The Applicants will compensate landowners for any crop damage or soil compaction that may occur during construction.

Forestry

No economically important forest resources are located along the existing route. Construction staging areas will be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent. No impacts to trees associated with residences or woodrows are anticipated to occur.

Tourism

No impacts to area tourism are anticipated from the presence of the transmission line and no mitigation is necessary.

Mining

Based on a review of existing information, the Morris 115 kV transmission line rebuild would not impact active mining or quarrying operations. No mitigation is necessary.

9.9.1.3 Archaeological and Historic Resources

The Applicants sponsored overviews of known archaeological and historic resources within the corridors (Palmer et al. 2005a, 2005b, 2005c). Section 6.1.4 of the Morris Route 1 provides results of the archival review of previously-recorded cultural resources and general information on the research methodology applied to the archival review. Detailed descriptions of these resources can be found in cultural resources overviews prepared by Palmer et al. (2005a, 2005b, 2005c).

9.9.1.4 Impacts and Mitigation: Archaeological and Historic Resources

As Section 6.1.4.3 of Morris Route 1 explains, construction of new transmission line facilities could impact previously-identified and currently unknown cultural resources. The realized potential impacts will be determined once routes are selected within the proposed corridors. Refer to Section 6.1.4.3 for a discussion of related archaeological and historic resource compliance measures and management.

9.9.1.5 Natural Environment

Air Quality

See Sections 6.1.5.1 and 9.1.2.5 for a general discussion of air quality along the Morris 115 kV transmission line rebuild.

Water Quality and Wetlands

See Sections 6.1.5.2 and 9.1.2.5 for a general discussion of water quality and wetlands along the Morris 115 kV transmission line rebuild.

Flora

See Sections 6.1.5.3 and 9.1.2.5 for a general discussion of flora along the Morris 115 kV transmission line rebuild.

Fauna

See Sections 6.1.5.4 and 9.1.2.5 for a general discussion of fauna along the Morris 115 kV transmission line rebuild.

Impacts and Mitigation: Natural Environment

Air Quality

Temporary and localized impacts to air quality may occur during construction due to the disturbance of soil, which raises fugitive dust particles and construction equipment emissions. Temporary impacts from fugitive dust will be minimized or avoided by using BMPs. Equipment emissions will be localized and only occur during the construction process; no long-term or hot spot effects are anticipated. No additional mitigation is necessary.

Water Quality

During construction, there is the possibility of sediment reaching surface waters as the ground is disturbed by excavation, grading and construction traffic. However, once the Project is completed, it will have no impact on surface water quality. The Applicants will maintain sound water and soil conservation practices during construction and operation of the Project to protect topsoil and adjacent water resources and minimize soil erosion. Construction will be completed according to NPDES permit requirements.

Flora and Fauna

See Section 6.1.5.5 for potential impacts and mitigation measures related to flora and fauna along the Morris 115 kV transmission line rebuild.

9.9.1.6 Rare and Unique Natural Resources

Section 6.1.6 lists all of the rare or unique resources identified within one mile of Morris Route 1. These resources were identified using the DNR Natural Heritage Database. See Section 6.1.6.1 for a general discussion of rare and unique natural resources along the Morris 115 kV transmission line rebuild.

9.9.1.7 Impacts and Mitigation: Rare and Unique Natural Resources

No impacts are anticipated to State threatened, State endangered and Federal candidate species and listed natural communities. See Morris Route 1 Section 6.1.6.1 for a discussion on management of the Project near DNR-listed natural communities.

10.0 AGENCY INVOLVEMENT, PUBLIC PARTICIPATION AND REQUIRED PERMITS AND APPROVALS

10.1 AGENCY CONTACTS

10.1.1 ADVISORY COUNCIL ON HISTORIC PRESERVATION

The Advisory Council on Historic Preservation was contacted by Western's Department of Energy on June 1, 2005 to inform them of the Project and let them know a PA will be sent to their office for review. The PA has not been transmitted to the State agencies as of the date of this Application. No response has been received as of the date of this Application.

10.1.2 MINNESOTA DEPARTMENT OF NATURAL RESOURCES

On April 21, 2005, the Applicants contacted the DNR Natural Heritage Program to inform them of the Project at the early stages and request information regarding potential effects to threatened and endangered species and rare natural features. The DNR responded on May 16, 2005 to the request by providing some general guidance on areas to avoid (Appendix N.1).

Misters Matt Langan, Tom Balcom and Ms. Rebecca Wooden of the DNR were contacted on May 23, 2005 to provide additional comments on the Project. Ms. Wooden of the DNR Wildlife and Scenic Rivers Program responded by phone on May 26, 2005 and commented that concerns related to the transmission line crossing the Minnesota River are minimal, since it would be replacing an existing transmission line and would not cross the river at a new location. She also commented that the crossing would be regulated by the regional DNR office and a crossing license would be issued from the New Ulm office (Appendix N.2).

The DNR was contacted by Western's Department of Energy on May 31, 2005 to inform them about the Project, for purposes of the Federal EIS, to invite the agency to the EIS Scoping Meetings June 14-16, 2005 and request input on scoping.

The DNR National Heritage Program was contacted on June 14, 2005 to request information on the potential effects of new transmission line facilities on threatened and endangered species and native plant communities in several counties in southwestern Minnesota within the boundaries of proposed corridors between the Project endpoints. The DNR had previously reviewed a request from Barr Engineering for transmission system upgrades being proposed by Otter Tail and reiterated that, "Once the route permit has been prepared and more definitive alignments are selected, [the DNR] will be able to provide more specific comments." The DNR requests that the Applicants:

- Avoid routing transmission lines through any "Sites of Biodiversity Significance" that have been ranked as outstanding, high, or moderate or through any native plant communities.
- Consider the "Railroad Rights-of-Way Prairies" data.
- Sound erosion and sediment control practices should be implemented and maintained in the vicinity of all stream and river crossings.
- No construction of transmission lines with Scientific and Natural Area (SNA) boundaries will be permitted.
- Avoid routing transmission lines through any WMAs.

In addition to written correspondence, the Applicants held face-to-face meetings with several individuals from the DNR on June 14, 2005 and June 16, 2005. The DNR was provided with the interagency meeting minutes for review and additional information was requested on the Prairie Survey Protocol. The DNR approved the use of the Prairie Survey Protocol in an email dated June 28, 2005 (Appendix N.3).

The DNR was contacted again on October 26, 2005 as a follow up to the June 14, 2005 letter. In accordance with the full permitting process under Minn. Rules 4400.1025, this letter was exclusively intended to gather comments for consideration in preparation of the Route Permit Application to the PUC. The Applicants requested input on the potential routes for the Project. The Applicants sent an email to the DNR requesting comments on routes, as well. The Applicants provided route shapefiles in this email for the analysis. However, in an email dated November 21, 2005, the DNR stated that "Due to workload issues, [the DNR is] not going to be able to review the various route options," in response to the October 26th Letter (Appendix N.4). After investigating the proposed route segments, the Applicants conjecture the DNR's preference to be the following combination of segments: M-1, M-2, M-3, M-6, M-8, M-11, M-13, M-14, M-18.

The DNR Natural Heritage Program was contacted by the Applicants on October 31, 2005 on behalf of Western to request comments on the new corridors in the vicinity of the proposed Big Stone 230 kV Substation and Chippewa, Lac Qui Parle, Swift and Yellow Medicine counties. The DNR responded on October 31, 2005 to emails regarding the above letter (Appendix N.5). The DNR is "unable to provide interpretation as to all possible elements that may be impacted by various alignments." Instead, they request to "provide more specific comments" "once the route permit has been prepared and more definitive alignments are selected."

10.1.3 MN/DOT

Mn/DOT Districts 4 and 8 were contacted on May 23, 2005 to discuss issues relating to the proposed transmission lines adjacent to the interstate and interchanges, the potential access for construction from State ROW and the ability to site structures through some of the interchanges.

The Mn/DOT, District 8, was contacted on September 30, 2005 to request comments for consideration in preparation of the Route Permit Application to the PUC. Mn/DOT, Districts 4 and 8 were contacted on October 26, 2005 to request input on the proposed routes. The Mn/DOT responded on November 9, 2005 regarding the Project (Appendix N.6). Upon review of the Project, Mn/DOT offered the following comments:

- Mn/DOT has some major roadway expansion planned within the next 10 years in the southwest area of Willmar. That expansion includes completion of the TH 23 4-lane bypass of Willmar and development of an interchange for and realignment of Kandiyohi County State Aid Highway (CSAH) 5. Mn/DOT is concerned about the exact locations of transmission lines and structures for the Segment W-16, W-17 and W-18 alignments.
- The Granite Falls 345 kV transmission line does not appear to impact any future transportation projects in the area.
- If approved, the Project will require utility installation, access and drainage permits.

10.1.4 MINNESOTA POLLUTION CONTROL AGENCY

The Minnesota Pollution Control Agency responded on July 21, 2005 (Appendix N.7) to Western's Department of Energy letter dated May 31, 2005.

The MPCA, Env. Review/Majors/Rem Division was contacted on May 23, 2005 and October 26, 2005 to request input on the proposed routes. No response has been received as of the date of this Application.

10.1.5 SHPO

The SHPO was contacted on April 21, 2005 to inform them of the Project at the early stages and request information regarding potential effects to cultural resources.

The SHPO, Section 106 Review and Compliance Department was contacted by Western's Department of Energy on June 1, 2005 to inform them of the Project and let them know a PA will be sent to their office for review. The PA has not been transmitted to the State agencies as of the date of this Application. No response has been received as of the date of this Application.

The SHPO was contacted by Western on October 26, 2005 to request input on proposed routes for the State transmission line permit applications within the alternative transmission line corridors.

10.1.6 U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 8

The EPA, Region 8's letter to Western's Department of Energy dated August 3, 2005 relayed the EPA's concern about impacts to existing aquatic resources, biological and natural resources, wildlife, habitat fragmentation, migratory birds, vulnerabilities to invasive plant species, human health and environmental impact to communities and tribes, HVTL noise, disclosure of EMFs and visual impacts from transmission lines. The EPA, Region 8 recommends avoidance first, mitigation second. When able, use of existing transmission line ROW is recommended. Contact with other natural resource agencies was encouraged. (Appendix N.8)

10.1.7 U.S. DEPARTMENT OF AGRICULTURE

The USDA's Farm Service Agency was contacted by Western's Department of Energy on May 31, 2005 to inform the USDA about the Project, invite the USDA to the EIS Scoping Meetings June 14-16, 2005 and request input on scoping.

The Ortonville Service Center of the USDA's NRCS was contacted by Western on October 26, 2005 to request input on the proposed routes and attached the route map and system alternatives map. No response has been received as of the date of this Application.

10.1.8 NATIONAL PARK SERVICE

The Midwest Regional Office of the National Park Service was contacted by Western's Department of Energy on May 31, 2005 to inform the USDA about the Project, invite the USDA to the EIS Scoping Meetings June 14-16, 2005 and request input on scoping. No response has been received as of the date of this Application.

10.1.9 USFWS

The U.S. Fish and Wildlife Service (USFWS) Minnesota and South Dakota USFWS Threatened and Endangered Species Review was contacted on April 21, 2005 to inform them of the Project at the early stages and request information regarding potential effects to threatened and endangered species. The USFWS, Twin Cities Field Office responded on May 20, 2005 regardign fish and wildlife resources specific to the Minnesota project area (Appendix N.9).

The FWS, Big Stone National Wildlife Refuge and Wetland Management District was contacted by Western's Department of Energy on May 31, 2005 to inform the FWS about the Project, invite the FWS to the EIS Scoping Meetings June 14-16, 2005 and request input on scoping. The FWS, Twin Cities Field Office responded on July 7, 2005 regarding potential effects to Federally-threatened and endangered species along the proposed routes and listed critical habitat (Appendix N.10). The following Federally-listed and candidate species may be present in four of the five affected counties within Minnesota (no Federally-listed species occur in Stevens County).

County	Common Name	Scientific Name	Status
Big Stone, Chippewa, Swift, Yellow Medicine	Bald Eagle	*Haliaeetus leucocephalus*	Threatened
Big Stone, Chippewa, Swift, Yellow Medicine	Dakota Skipper	*Hesperia dakotae*	Candidate
	Western Prairie Fringed Orchid	*Platanthera praeclara*	Threatened

The FWS, Twin Cities Field Office also responded in regards to Service Region 3, in which there are a number of individual National Wildlife Refuge or Wetland Management District properties that may be directly or indirectly impacted by the Project.

The FWS, Twin Cities Field Office would like to discuss further with the Applicants to clearly understand the roles and expectations of being a cooperating agency before agreeing to cooperating agency status. The FWS, Twin Cities Field Office strongly advocates for project alternatives and designs that avoid adverse impacts to Trust lands and resources.

In a letter dated October 20, 2005, the FWS, Twin Cities Field Office provided information related to fish, wildlife and their habitats for the Project (Appendix N.11). The FWS requests a bald eagle nest survey of any proposed route prior to final design and requests that the Applicants contact the DNR "directly to ensure that stat-listed habitats and species are included in route considerations." Several corridor-specific comments were as follows:

- "Adverse affects to migratory birds using the Minnesota River corridor cause by conflict with the proposed transmission lines are also a concern."

- Recommend a route adjustment to avoid a high value wetland/grassland complex (Sections 25, 26, 35 and 36, T122N, R46W and Sections 19, 20, 29, 30 and 31, T22N, R45W).
- Avoid a very large drained wetland (Sections 9, 10, 11, 14 and 15, T122N, R45W) that the FWS has an interest in restoring.
- Avoid WPAs and wetland or grassland easements detailed in the map and GIS shapefiles provided by the FWS.
- Concern for impacts to public lands.
- Avoid an important migratory bird area near Salt Lake area on the Minnesota/South Dakota border.

The FWS Twin Cities Field Office was contacted by Western on October 26, 2005 to request input on the proposed routes and attached the route map and system alternatives map.

The Applicants met with Laurie Fairchild at the FWS, Twin Cities Field Office on November 14, 2005 to discuss threatened and endangered species, Federal lands and an overview of the route alignments and corridors. The FWS hasn't had a chance to look at the routes and it will be difficult to get input from five offices. The FWS requests the Applicants look for prairie habitat candidate species. The Applicants will consult State-listed species and will not route transmission lines through the refuge. The FWS requests replacing acreage to acreage, usually 1:1, on the easements and would like to know how many easements will be needed. The FWS is concerned about business impacts, height restrictions and will need to know the height of existing transmission lines. The FWS requests avoidance of the Salt Lake area. The Applicants will need mitigation since Federal aid is strict on requirements. If amount of easements in preferred routes would be significant on Federally-owned property the Applicants need to do a compatibility analysis. The FWS doesn't foresee any big issues.

The Applicants sent Ms. Fairchild shape files for the two new corridors and routes within all of the corridors and the updated Morris Corridor Route Map. Ms. Fairchild sent the Applicants shape files for species identified on FWS maps that were not part of the DNR Natural Heritage data.

10.1.10 U.S. ARMY CORPS OF ENGINEERS

The USACE, St. Paul District was contacted on April 21, 2005 to inform them of the Project at the early stages and request information regarding potential effects to waters of the U.S. and navigable waters of the U.S.

The USACE St. Paul and Omaha District Commanders were contacted by Western's Department of Energy on May 31, 2005 to inform the USACE about the Project, invite the USACE to the EIS Scoping Meetings June 14-16, 2005 and request input on scoping. The USACE, Omaha District responded on June 10, 2005 (Appendix N.12). Their primary concern is that the Applicants follow the requirements and regulations regarding transmission line and facility construction and use in relation to waters of the U.S. Although the USACE's "primary responsibility is associated with aquatic resources, our regulations require we assess impacts to factors relative to the public interest. including, but not limited to, fish and wildlife, historic, scenic, and recreational values, property ownership, floodplain management, water supply and conservation, mineral needs, navigation, economics and mitigation." On July 21, 2005, the USACE, Omaha District replied in similar terms (Appendix N.13).

The U.S. Army Corps of Engineers (USACE), St. Paul and Omaha District Commanders were contacted by Western on October 27, 2005 to request input on the proposed routes and attached the route map and system alternatives map.

10.2 PUBLIC PARTICIPATION

10.2.1 INFORMATIONAL MEETINGS

The Applicant's conducted six informational public meetings in March and April 2005. The meetings were conducted in the towns of Canby, Granite Falls, Willmar, Morris, Benson and Ortonville. These meetings were designed to introduce the project and to get input on the proposed corridors and other issues of concern. A presentation was given by a representative of Otter Tail Power Company, which included the following topics:

- Need for Power
- Proposed Addition of the BSP II Power Plant
- Identification of the Big Stone Transmission Project partners
- Project Schedule
- Opportunities for Public Input
- Transmission Route Alternatives
- Public Information Sources

The primary concerns raised by those in attendance were:

- Interference of the transmission line with farming practices.

- Landowner issues including placement on property, easement procedures, property values, crop losses and ROW
- Stray Voltage from HVTL
- Health Effects from HVTL
- Audible noise from HVTL
- Signal interference for radios, television, GPS or satellite dishes.
- Visual Impacts
- Need for new HVTL
- Line Construction
- Vegetation
- Alternate Technologies including Wind Power

10.2.2 FEDERAL EIS SCOPING MEETINGS

Western held three public scoping meetings in June 2005. The meetings were held in Milbank, South Dakota, Morris, Minnesota and Granite Falls. The meetings were conducted in an open-house format providing an opportunity for information exchange about the proposed project. Attendees were provided project information and the opportunity to speak with resource specialists about concerns related to the project. Display boards showing project location, resource information, the NEPA process and the Minnesota and South Dakota State permitting processes aided in the information exchange. Comments collected through the scoping process will be included in the Project EIS and scoping document.

10.2.3 PRE-APPLICATION MEETINGS

Landowner pre-application meetings were held in August 2005 at five locations in Granite Falls, Benson, Willmar, Canby, and Ortonville, Minnesota. The number of attendees ranged from 21 to 59 attendees. The meetings were conducted in an open-house format similar to the Federal public scoping meetings previously discussed. Applicant representatives and resource specialists were available to provide information and answer questions about the project and proposed transmission routes. Public comment cards were also available for attendees to record their comments. The comments were entered into a database and analyzed to ensure that each issue was considered during the preparation of the permit application.

The primary concerns identified during the meetings and recorded on comment cards were similar to those raised at the informational meetings held in March and April 2005. The concerns varied among a range of subject areas including agriculture, alternate technologies, transmission line routing, construction procedures, environmental concerns, landowner issues, land use, Federal and State processes, public safety, signal interference, project purpose, visual effects, cultural impacts, and project benefits. A summary of the comments received are provided in Appendix P.1.

10.2.4 IDENTIFICATION OF LANDOWNERS

Landowner names are provided in Appendix O.2. The landowners that could potentially be impacted by one or more of the proposed routes and substation sties are included in the application.

10.3 PERMITS THAT MAY BE REQUIRED

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	
Certificate of Need	MN PUC
Route Permit	MN PUC
Cultural and Historic Resources Review	MN SHPO
Endangered Species Consultation	MN DNR – Ecological Services
License to Cross Public Waters	MN DNR – Lands and Minerals
Utility Permit	Mn/DOT
Wetland Conservation Act	BWSR
NPDES Permit	MPCA
South Dakota State Approvals	
Transmission Facility Route Permit	SD PUC
Section 401 Water Quality Certification	SD DENR
Cultural and Historic Resources Review	SD SHPO

Permit	Jurisdiction
Endangered Species Consultation	SD GFP
Permit to Occupy ROW	Mn/DOT
NPDES Permit	SD DENR
Federal Approvals	
Environmental Impact Statement	Western (DOE)
Section 106 Review	Western (DOE)
Regulations for Compliance with Floodplain/Wetlands Environmental Review Requirements	Western (DOE)
Section 7 Consultation	FWS
Section 10 Permit	Corps of Engineers
Section 404 Permit	Corps of Engineers
Permit to Cross Federal Aid Highway	FHWA
Notice of Proposed Construction (7460-1)	FAA
Notice of Actual Construction or Alteration	FAA
Farmland Protection Policy Act/Farmland Conversion Impact Rating	USDA/NRCS
Spill Prevention, Control and Countermeasure (SPCC) Plan	EPA
FWS	Compatibilty Analysis of Disturbed Easements/Lands

10.3.1.1 Local Approvals

Typical local approvals associated with transmission line construction are listed below. Per Minn. Stat. 116C.61, subd. 1, the issuance of a route permit is the only approval required to be obtained by the utility; however, the Applicants will work with local governments to address concerns related with these approvals.

Road Crossing/ROW 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.

10.3.1.2 State of Minnesota Approvals

Certificate of Need

Prior to issuance of a route permit, a CON is required from the PUC.

Route Permit

HVTLs cannot be constructed without a route permit approved by the PUC.

Cultural and Historic Resources Review

A cultural and historic resources review was conducted by the State Minnesota SHPO. This review assists the Applicants in identifying potential impacts to cultural and historic resources.

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 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 Minn. Stat. §84.415 and Minn. Rules, §6135. The Applicants will file these permits once the design of the transmission line is complete and will acquire the permit 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 Applicants will file for this permit once the design of the transmission line is complete and will acquire the permit prior to construction.

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 since the construction will cause a disturbance of greater than one acre for the whole of the project.

10.3.1.3 State of South Dakota Approvals

Transmission Facility Route Permit

A transmission line cannot be constructed without a route permit from the Public Utilities Commission. A permit will be applied for as outlined in South Dakota Codified Law 49-41B-11 in the near future. The SD PUC only requires one route to review and approve (or reject). There are two possible locations where the Granite Falls transmission line will cross over from South Dakota into Minnesota, and the Applicants encourage the Commission to cooperatively work with the South Dakota PUC as dictated by Minn. Stat. 116C.53, subd.3.

Section 401 Water Quality Certification

This permit is required for fill in jurisdictional waters of the United States, and is intended to ensure that the project will not impact the stream quality or violate surface water quality standards. The certification is required from the SD DENR.

Cultural and Historic Resources Review

A cultural and historic resources review was conducted by the State South Dakota SHPO. This review assists the Applicants in identifying potential impacts to cultural and historic resources.

Endangered Species Consultation

The South Dakota GFP Wildlife Diversity Program maintains and inventory, protects, and manages the species and habitats that comprise the biological diversity of South Dakota. Consultation was requested from the department for the project regarding rare and unique species.

Permit to Occupy ROW

This permit is required by the South Dakota Department of Transportation an is required for the Applicants to gain access to the work site from highway ROW.

NPDES Permit

See Minnesota NPDES permit requirements.

10.3.1.4 Federal Approvals

Environmental Impact Statement

Interconnection of the proposed Transmission Line Project and the associated BSP II Power Plan would incorporate a major new generation resources into Western's transmission system. Western has determined that an EIS is required under U.S. Department of Energy (DOE) NEPA Implementing Procedures (10 CFR 1021). The EIS will be prepared in accordance with the National Environmental Policy Act with Western as the lead Federal agency.

Section 106 Review

Section 106 of the NHPA requires Federal agencies to "take into account" the effects of their actions on "historic properties" (i.e., districts, sites, buildings, structures and objects included in or eligible for the NRHP). Section 106 is implemented by following regulations issued by the Advisory Council on Historic Preservation (36 CFR 800). Western is the lead Federal agency for 106 compliance. Agency Section 106 responsibilities can be coordinated with the NEPA process by planning for public participation, analysis and review, such that the purposes and requirements of both statutes are met in a timely and efficient manner.

Section 7 Consultation

The FWS consults with Federal agencies under Section 7 of the Endangered Species Act to ensure the Project does not jeopardize listed species or destroy or adversely modify critical habitat.

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 Applicants will apply for a permit for each of the crossings 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 Applicants will apply for these permits once a route is awarded for the Project.

Notice of Proposed Construction

Notice and approval are required for structures 200 feet in height or the height of the structures would exceed a slope requirement as defined in the FAA Advisory Circular (AC 70/7460-2K). Form 7460-1 is required for the notice.

Notice of Actual Construction or Alteration

This is required to provide the FAA with final construction as-built information for their records, using Form 7460-2.

Farmland Protection Policy Act (FPPA)/Farmland Conversion Impact Rating

The intent of the FPPA is to minimize the conversion of farmland to nonagricultural uses by Federal Projects. The Applicants will work with Western to meet the requirements of this program.

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 Applicants will update and develop their SPCC plans at substations meeting the criteria per 40 CFR 112.

Compatibility Analysis of Disturbed Easements/Lands

This permit is required for work within easements owned by the FWS. Compatibility is determined in accordance with the National Wildlife Refuge System Improvement Act. A compatible use is a wildlife-dependent recreational use or any other use on lands that in the sound professional judgment of the director will not materially interfere with or detract from the fulfillment of the mission of the FWS (wildlife conservation) or purposes of the land. The Applicants will work closely with the FWS on potential impacts to their lands.

11.0 APPLICATION SUMMARY

In this document and in the Certificate of Need Application, the Applicants have put forth the case for construction of two new high voltage transmission lines to serve the proposed Big Stone Unit II. The Applicants have identified and evaluated two different system alternatives into Minnesota and several different routes for the new lines.

The data show that the two lines preferred by the Applicants – one from Big Stone to Morris and one from Big Stone to Granite Falls – are the best of the system alternatives, and that the routes preferred by the Applicants between those endpoints are better than the alternative routes that were analyzed. More specifically:

- Morris Route 1 is a rebuild of approximately 99.7 percent of an existing transmission line and should minimize the amount of previously-undisturbed habitat.
- Although the structures proposed for Morris Route 1 will be slightly taller than the existing structures, the route will not be a new visual feature. Additionally, the primary concerns raised at public meetings are better addressed using Morris Route 1.
- Granite Falls Route 1 follows existing transmission line ROW for approximately 84 percent of the route. In relation to the other Granite Falls alternatives, Granite Falls Route 1 therefore is more consistent with the State's policy (PEER vs. Minnesota Environmental Quality Council and Minnesota Rules part 4400.3150, items H and J) of utilizing existing transmission rights of way (See Section 5.3).
- Although the structures proposed for Granite Falls Route 1 will be slightly taller than the existing structures along the rebuild sections, the route will not be a new visual feature along approximately 49 percent of the route. Additionally, the primary concerns raised at public meetings are better addressed using Granite Falls Route 1.
- Granite Falls Route 1 is the least cost option of the Granite Falls Route alternatives. Costs for Route 1 are estimated between $24,136,733 and $33,148,320.
- Granite Falls Route 1 will have less agricultural impact than the other Granite Falls Route alternatives.

- Granite Falls Route 1 will have less impact on the sensitive rock outcrop communities along the Minnesota River near Granite Falls.

The new lines will enhance the state's electric energy security and expand the capacity of the transmission grid from an area of the state where development of additional generation sources is likely to occur.

Minnesota Statutes § 116C.57, subd. 8(b), provides that when the Commission issues a route permit, it shall specify "the design, routing, ROW preparation, and facility construction it deems necessary" with any appropriate conditions. The Applicants request that the Commission issue a route permit in this case authorizing construction of a new 230 kilovolt line from the Minnesota/South Dakota border crossing to the Morris Substation along the route preferred by the Applicants and authorizing construction of a line from the Minnesota/South Dakota border crossing to the Granite Falls Substation that will be constructed to 345 kilovolt specifications except for the last 9.4 miles between the eastern edge of Hazel Run township and the Granite Falls Substation along the route preferred by the Applicants. The Applicants request that the permit authorize the permittees to energize the Granite Falls line to 345 kV when future independent projects are constructed that are capable of 345 kV operation.

In addition, the Applicants request that the permit authorize the permittees to modify the substations that will require new equipment and other modifications to accommodate the future projects. The Applicants also understand that the permit will include other reasonable and appropriate conditions similar to what has been included in permits issued in the past for new transmission.

Finally, the Applicants request that the Commission recognize in the permit that the Granite Falls line must be constructed and ready for operation in 2009 and the Morris line must be constructed and ready for operation in 2010.

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13.0 DEFINITIONS

aggregate	A mass or body of rock particles, mineral grains, or a mixture of both; any of several hard, inert materials, such as sand, gravel, slag, or crushed stone, mixed with a cement or bituminous material to form concrete, mortar, or plaster, or used alone, as in railroad ballast or graded fill. The term can include rock material used as chemical or metallurgical fluxstone.
avian	Of or relating to birds.
A-weighted decibel scale	Decibels with the sound pressure scale adjusted to conform with the frequency response of the human ear.
base load power plant	Provides a steady flow of power regardless of total power demand by the grid. These plants run at all times through the year except in the case of repairs or scheduled maintenance.
capacity	The capability of a system, circuit, or device for storing electric charge.
carbon sequestration technologies	Applicable to the reduction of emissions from electric generation point sources and to the decarbonization of fuels for use in other applications.
clayey	Resembling or containing clay.
conductor	A material or object that permits an electric current to flow easily.
corona	The breakdown or ionization of air in a few centimeters or less immediately surrounding the conductors.
corridor	For the purposes of the Project, an approximately three-mile strip of land that was considered for the placement of the route. The corridors will be analyzed in the Federal EIS.
Cretaceous	144 to 65 million years ago.
decibels (dB)	A unit for expressing the ratio of two amounts of electric or acoustic signal power equal to 10 times the common logarithm of this ratio; a unit for expressing the ratio of the magnitudes of two electric voltages or currents or analogous acoustic quantities equal to 20 times the common logarithm of the voltage or current ratio.
de-energized	To disconnect from a source of electricity; shut off the power to.
direct current (DC)	A continuous flow of electric charge through a conductor, such as a wire, from high to low potential.
double-circuited	The transmission structure is carrying two sets of transmission lines, each with three conductors.
Ecological Classification System (ECS)	Part of a nationwide mapping initiative developed to improve our ability to manage all natural resources on a sustainable basis. This is done by integrating climatic, geologic, hydrologic and topographic, soil and vegetation data.
fauna	The collective animals of any place or time that live in mutual association.
flora	The collective plants of any place or time that live in mutual association.

Granite Falls Routes 1 and 3 or Granite Falls Routes 2 and 4	For the purposes of the Application, refers to the common segments being analyzed for either Granite Falls Route 1, Route 2, Route 3 or Route 4. Routes 1 and 3 are essentially the same from from Florida Township, as are Routes 2 and 4.
Granite Falls Routes 1 and 3 or Granite Falls Routes 2 and 4	For the purposes of the Application, refers to the route as a whole versus a common segment.
ionization	Removal of an eletron from an atom or molecule.
oxide	A compound of oxygen with one other more positive element or radical.
ozone	A form of oxygen in which the molecule is made of three atoms instead of the usual two.
Project	Pertains to all portions of the proposal, including proposed transmission facilities and associated facilities.
raptor	A member of the order Falconiforme, which contains the diurnal birds of prey, such as hawks, harriers, eagles and falcons.
route	For the purposes of the Application, a 2,000-foot wide section of land that the Applicants propose to construct the transmission line within.
route alignment	For the purposes of the Application, a proposed location within the route for the transmisison line to be constructed.
Scientific and Natural Area	A program administered by the DNR with the goal to preserve and perpetuate the ecological diversity of Minnesota's natural heritage, including landforms, fossil remains, palnt and animal communities, rare and endangered species, or other biotic features and geological formations, for scientific study and public edification as components of a healthy environment.
Sstem Alternative	One of two alternatives that was analyzed in the CON that includes a package of improvements for each alternative. Each package included a route to Granite Falls. The primary difference between each system alternative is the choice of endpoint for the second transmission line. System Alternative 1 includes a route to Morris, whereas System Alternative 2 includes a route to Willmar.
transformer	An electrical device by which alternating current of one voltage is changed to another voltage.
voltage	Electric potential or potential difference expressed in volts.
wetland	Areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands include swamps, marshes, bogs and similar areas.

14.0 ABBREVIATIONS

A	ampere
ACSR	Alluminum core steel reinforced
ACSS	Alluminum core steel supported
ALJ	Administrative law judge
APE	Area of Potential Effect
BMP	Best Management Practices
CapX	Capital Expenditures for the Year 2020
CFR	Code of Federal regulations
CON	Certificate of Need
dB	decibels
DC	direct current
DEIS	Draft Environmental Impact Statement
DNR	Minnesota Department of Natural Resource
DOC	Minnesota Department of Commerce
DOE	Minnesota Department of Energy
Mn/DOT	Minnesota Department of Transportation
EA	Environmental Assessment
ECS	Ecological classification system
EIS	Environmental Impact Statement
EMF	electromagnetic field
EPA	Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
F	degrees Fahrenheit
FWS	U.S. Fish and Wildlife Service
G	gauss
GIS	Geographic information system
HVTL	high voltage transmission line
Hz	Hertz
kV/m	kilovolts per meter
MAPP	Mid-continent Area Power Pool
MBTA	Migratory Bird Treaty Act
MCBS	Minnesota County Biological Survey
MISO	Midwest Independent System Operator
MW	megawatt
NAC	Noise area classification
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Ellimination System
NPS	National Park Service
NRCS	National Resources Conservation Service
NRI	National River Inventory
NWI	National Wetland Inventory
PA	Programmatic Agreement
PLS	Public Land Survey
ppm	parts per million
PUC	Minnesota Public Utilities Commission

PWI	Public Water(s) Inventory
ROD	Record of Decision
ROW	Right-of-way
RUS	Rural Utilities Service
SDPUC	South Dakota Public Utilities Commission
SHPO	Minnesota State Historic Preservation Office
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WCA	Wetland Conservation Act
WPA	Wildlife/Waterfowl Protection Agency

APPENDIX A
CERTIFICATE OF NEED

APPENDIX B
PROPOSED PROJECT MAPS

APPENDIX C
PROJECT LOCATION AND STRUCTURE GRAPHICS

County	Township	Range	Section
Morris Route 1 (Preferred Route)			
Big Stone	121	46	2,11,14-16,21
	122	45	3,4,9,10,15-22,25-30
	122	46	25,35,36
	123	45	3,4,9,10,15,16,21,22,27,28,33,34
Stevens	124	43	1,2,7-12
	124	44	7-12
Big Stone	124	45	9-12,15,16,21,22,27,28,33,34
Morris Route 2			
Big Stone	121	46	2,11,14-16,21
	122	45	4,5,8,9,17-20
	122	46	13,23-26,35
	123	45	2,3,10,11,14,15,22,23,26-28,32-35
Stevens	124	43	2-6
	124	44	1-6
Big Stone	124	45	1-3,10,11,14,15,22,23,26,27,34,35
Willmar Route 1			
Kandiyohi	119	35	27-30,34
	119	36	25-30
Chippewa	119	37	1,2,11-14,23-26
Swift	120	37	6-11,11-17,23,25,26,35,36
	120	38	1-3,12
	121	37	31
	121	38	28-36
	121	39	19-30
	121	40	19-30
	121	41	15-27
	121	42	13-24
	121	43	13-24
Big Stone	121	44	13-15,18-24
	121	45	13,19-30
	121	46	15,16,21-27

County	Township	Range	Section
Willmar Route 2			
Kandiyohi	119	35	27,31-34
	119	36	29-36
Chippewa	119	37	5,8,17,20,25-29,36
Swift	120	37	29-32
	120	38	25-36
	120	39	13-26,35,36
	120	40	13-24
	120	41	6,7,13-24
	120	42	1,12,13,24
	121	41	19,20,29-32
	121	42	7-10,13-18,24,25
	121	43	7-18
Big Stone	121	44	10-18
	121	45	13-23
	121	46	13-16,21,24
Granite Falls Route 1 (Preferred Route)			
Yellow Medicine	115	39	5,6
	115	40	1,2,11-14,23-30
	115	41	25-30
	115	42	25-30
	115	43	25-30
	115	44	25-30
	115	45	19-25
	115	46	1-6,12,13,24
Chippewa	116	39	28,29,32
Lac Qui Parle	116	46	31-36
Grantie Falls Route 2			
Yellow Medicine	115	40	2,3,10,11,14,15,22,23,26-35
	115	41	31-36
	115	42	31-36
	115	43	19,20,28-30,32-36
	115	44	19-30
	115	45	6-16,24,25
	115	46	1-12
Chippewa	116	39	28-31
Yellow Medicine	116	40	34-36
Lac Qui Parle	116	46	31

County	Township	Range	Section
Granite Falls Route 3			
Yellow Medicine	115	39	5,6
	115	40	1,2,11-14,23-30
	115	41	25-30
	115	42	25-30
	115	43	25-30
	115	44	25-30
	115	45	20-25
	115	46	1,2,12,13,24
Chippewa	116	39	28,29,32
Lac Qui Parle	116	46	4,9,10,15,16,21,22,25-28,34-36
	117	46	3,10,15,22,27,34
	118	46	3,10,15,22,27,34
	119	46	3,10,15,22,27,34
	120	46	21,22,27,34
Granite Falls Route 4			
Yellow Medicine	115	40	1-3,10,11,14,15,22,23,26-35
	115	41	31-36
	115	42	31-36
	115	43	19-21,28-30,32-36
	115	44	19-30
	115	45	5-16,24,25
Chippewa	116	39	28-31
Yellow Medicine	116	40	34-36
Lac Qui Parle	116	45	6,7,18,19,30,31
	117	45	31,32,
	117	46	1,2,11-14,23-26,35,36
	118	46	1,2,11-14,23-26,35,36
	119	46	1,2,11-14,23-26,35,36
	120	46	8,9,13-17,23-26,35,36

APPENDIX D
PROJECT COSTS AND IMPACTS TABLES

APPENDIX E
SUBSTATION DRAWINGS

APPENDIX F
MORRIS DETAILED ROUTE MAPS

APPENDIX G
WILLMAR DETAILED ROUTE MAPS

APPENDIX H
GRANITE FALLS DETAILED ROUTE MAPS

APPENDIX I
LAND USE INFORMATION

General Land Cover Category	Specific GAP Category
Agriculture	Cropland
	Grassland
Wetland/Riparian/ Open Water	Floating Aquatic
	Water
	Broadleaf Sedge/Cattail
	Sedge Meadow
Forest	Red Pine
	Red Cedar
	Cottonwood
	Lowland Deciduous
	Aspen/White Birch
	Maple/Basswood
	Bur/White Oak
	Red Oak
Shrubland	Lowland Deciduous Shrub
	Upland Shrub
Prairie	Prairie
Developed	High intensity urban
	Low intensity urban
	Transportation

APPENDIX J
PHOTOGRAPHS

APPENDIX K
ENVIRONMENTAL OVERVIEW MAPS AND GRAPHICS

APPENDIX L
CULTURAL RESOURCES TABLES

APPENDIX M
FLORA AND FAUNA INFORMATION

Community Type	Description
Dry hill prairie (southern) type	Dry to dry mesic prairies on well-drained soils on slopes and hilltops on glacial till. Dominant grasses are little blue stem (*Schizachyrium scoparium*), side-oats grama (*Bouteloua curfipendula*) , big bluestem (*Andropogon gerardii*), porcupine grass (*Stipa spartea*) and prairie dropseed (*Sporobous cryptandrus*). Typical forbs include prairie smoke (*Geum triflorum*), purple prairie clover (*Petalostemon purpureum*), prairie phlox (*Phlox pilosa*), silverleaf scurfpea (*Psoralea argophyll*), buffalo bean (*Astragalus crassicarpus*), sky blue aster (*Aster oolentangiensis*) and wild licorice (*Glycyrrhiza lepidota*).
Mesic prairie (southern) type	Prairies on moist soil of level to shallowly sloping terrain on glacial till or outwash. Dominant grasses are big bluestem, Indian grass (*Sorghastrum avenaceum*) and prairie dropseed; common associated graminoids include little bluestem, Leiberg's panic grass (*Panicum leibergii*) and switch grass (*Panicum virgatum*). Typical forbs include grey-headed coneflower (*Ratibida pinnata*), heart-leaved alexanders (*Zizia aptera*), blazing stars (*Liatrisligulistylis* and *L. aspera*), purple prairie clover and ironweed (*Vernonia faciculata*).
Southern bedrock outcrop class	Plant communities growing in fissures and shallow depressions on granite outcrops in the Minnesota River Valley. Outcrops are scattered within dry to mesic prairie communities. Characteristic plants of rock outcrops are rock spike-moss (*Selaginella rupestris*), sand dropseed (*Sporobolus cryptandrus*), false pennyroyal (*Isanthus brachiatus*), prickly pear cactus (*Opuntia fragilis*), ball cactus (*Coryphantha vivipara*), sleder-leaved bluet (*Houstonia longifolia*), rusty woodsia (*Woodsia ilvensis*), fameflower (*Talinum parviflorum*), awned cyperus (*Cyperus aristatus*), aromatic aster (*Aster oblongifolius*) and golden aster (*Heterotheca villosa*).
Wet prairie (southern) type	Wet prairies on poorly drained, mineral or shallow organic soil in shallow depressions. Dominant graminoids are prairie cordgrass (*Spartina pectinata*), bluejoint grass (*Calamagrostis canadensis*), woolly sedge (*Carex lasiocarpa*) and Sartwell's sedge (*Carex sartwellii*). Scattered clumps of willows (*Salix spp.*) and red-osier dogwood (*Cornus stolonifera*) present. Typical forbs include gayfeather (*Liatris pycnostachya*), sneezeweed (*Helenium autumnale*), Virginia mountain-mint (*Pycnanthemum virginianum*), New England aster (*Aster novac-angliae*) and great lobelia (*Lobelia siphilitica*).
Dry sand - gravel prairie (southern) type	Dry prairies on level to steep terrain on sandy outwash deposits on terraces within major river valleys. Dominant grasses are little bluestem and side-oats grama; associated grasses include Indian grass, prairie dropseed June grass (*Koeleria macrantha*) and plains muhly grass (*Muhlenbergia cuspidate*). Some of the more common forbs are pasque flower (*Pulsatilla nuttalliana*), larkspur (*Delphinium virescens*), hoary frostweed (*Helianthemum bicknellii*), white sage (*Artemesia ludoviciana*), narrow-leaved puccoon (*Lithospermum incisum*), prairie bird-foot violet (*Viola pedatifida*), bluets (*Hedyotis longifolia*) and harebell (*Campanula rotundifolia*).
Mixed Emergent Marsh (southern) type	Marshes dominated by wetland species other than cattails. Mixed emergent marshes tend to occur on harder bottoms than cattail marshes. Bulrushes such as hard-stemmed bulrush (Scirpus acutus), river bulrush (Sx fluviatilis), softstem bulrush (S. validis), S. americanus and S. heterochateus are dominant. Common reed grass (Phragmites australis), spike rushes (Eleocharis spp.), prairie cordgrass (Spartina pecinata), broad-leaved arrowhead (Sagittaria latifolia) also occur.

LIST OF DOCUMENTED MAMMAL SPECIES IN PROJECT AREA (AS LISTED BY DNR)

Common Name	Scientific Name	Habitat	Distribution*
Arctic Shrew	*Sorex arcticus*	Moist woods and riparian areas	K, St, Sw
Big Brown Bat	*Eptesicus fuscus*	Deciduous forests	K
Deer Mouse	*Peromyscus maniculatus*	Grasslands and forests	BS
Eastern Chipmunk	*Tamias striatus*	Deciduous forests, forest edges and scrubland	BS, K
Ermine	*Mustela erminea*	Forests and scrubland, hunt in wet areas	K, Sw
Hayden's Shrew	*Sorex haydeni*	Moist woods and riparian areas	K, St, YM
House Mouse	*Mus musculus*	Fields and farmland	K, St
Masked Shrew	*Sorex cinereus*	Bottomland and upland forests	BS, K, L, St, Sw, YM
Meadow Jumping Mouse	*Zapus hudsonius*	Riparian areas	BS, K, L, St, Sw, YM
Meadow Vole	*Microtus pennsylvanicus*	Prairies and wet meadows	BS, K, L, St, Sw, YM
Northern Grasshopper Mouse	*Onychomys leucogaster*	Grasslands	Sw
Northern Short-tailed Shrew	*Blarina brevicauda*	Moist woods and riparian areas	K, L, St, YM
Plains Pocket Gopher	*Geomys bursarius*	Prairies and pastures	BS
Prairie Deer Mouse	*Peromyscus maniculatus bairdii*	Prairies	L, St, Sw, YM
Southern Red-backed Vole	*Clethrionomys gapperi*	Mixed forests and marshes	K
Thirteen-lined Ground Squirrel	*Spermophilus tridecemlineatus*	Grasslands	BS, K, St, Sw, YM
Virginia Opossum	*Didelphis virginiana*	Deciduous open woods and farmland	K
Western Harvest House	*Reithrodontomys megalotis*	Grasslands	YM
White-footed Mouse	*Peromyscus leucopus*	Upland forests	BS, K, L, St, Sw, YM

** - BS = Big Stone County, K = Kandiyohi County, L = Lac Qui Parle County Sw = Swift County, St = Stevens County, YM = Yellow Medicine County. No data was available for Chippewa County*

LIST OF DOCUMENTED BIRD SPECIES IN PROJECT AREA (AS LISTED BY DNR AND THE MOU)

Common Name	Scientific Name	Habitat	Distribution*
Acadian Flycatcher	*Empidonax virescens*	Mature forest	K, Sw
Alder Flycatcher	*Empidonax alnorum*	swamps, streamside and lakeside thickets	BS, C, K, L, St, Sw, YM
American Avocet	*Recurvirostra americana*	mudflats, in saline lakes, in fresh water and saltwater marshes	BS, C, K, L, St, Sw, YM
American Bittern	*Botaurus lentiginosus*	marshes, grassy lakeshores	BS, C, K, L, St, Sw, YM
American Black Duck	*Anas rubripes*	marshes, ponds, lakes	BS, C, K, L, St, Sw, YM
American Coot	*Fulica americana*	marshes, ponds, lakes	BS, C, K, L, St, Sw, YM
American Crow	*Corvus brachyrhynchos*	Forested areas along streams, city streets and parks,	BS, C, K, L, St, Sw, YM
American Golden-Plover	*Pluvialis fulva*	Lakeshores and prairies	BS, C, K, L, St, Sw, YM
American Goldfinch	*Carduelis tristis*	weedy fields and flood plains	BS, C, K, L, St, Sw, YM
American Kestrel	*Falco sparverius*	open fields, forest edges	BS, C, K, L, St, Sw, YM
American Pipit	*Anthus rubescens*	grasslands and sedge meadows	BS, C, K, L, St, Sw, YM
American Redstart	*Setophaga ruticilla*	Open deciduous or mixed woodlands, forest edges, roadside trees	BS, C, K, L, St, Sw, YM
American Robin	*Turdus migratorius*	open woodlands, fields, gardens and yards	BS, C, K, L, St, Sw, YM
American Tree Sparrow	*Spizella arborea*	willow and birch thickets; fields, weedy woodland edges	BS, C, K, L, St, Sw, YM
American White Pelican	*Pelecanus erythrorhynchos*	Shallow lakes and marshes	BS, C, K, L, St, Sw, YM
American Wigeon	*Anas americana*	ponds, lakes and marshes	BS, C, K, L, St, Sw, YM
American Woodcock	*Scolopax minor*	Moist, early-successional woodlands near open fields or forest clearings	BS, C, K, L, St, Sw, YM
Baird's Sandpiper	*Calidris bairdii*	marshes and wet meadows	BS, C, K, L, St, Sw, YM
Bald Eagle	*Haliaeetus leucocephalus*	Forested areas near lakes and rivers	BS, C, K, L, St, Sw, YM
Baltimore Oriole	*Icterus galbula*	Deciduous woodlands and shade trees	BS, C, K, L, St, Sw, YM
Band-tailed Pigeon	*Columba fasciata*	Coniferous forests	St
Bank Swallow	*Riparia riparia*	found near water, nest in banks	BS, C, K, L, St, Sw, YM
Barn Owl	*Tyto alba*	Grasslands, farmsteads	L
Barn Swallow	*Hirundo rustica*	Farmsteads, open woods	BS, C, K, L, St, Sw, YM
Barred Owl	*Strix varia*	Forests with some mature trees near open country	BS, K,L, St, Sw, YM
Barrow's Goldeneye	*Bucephala islandica*	Lakes and marshes	BS, L
Bay-breasted Warbler	*Dendroica castanea*	Boreal forests	BS, C, K, L, St, Sw, YM
Bell's Vireo	*Vireo bellii*	upland and lowland carr, riparian areas, brushy fields and young second-growth forest or woodland	L, St
Belted Kingfisher	*Ceryle alcyon*	Lakes and marshes	BS, C, K, L, St, Sw, YM

Common Name	Scientific Name	Habitat	Distribution*
Bewick's wren	*Thryomanes bewickii*	Lowland forest	L
Black Scoter	*Melanitta nigra*	Lakes and boreal forests	BS, C, K. L
Black Tern	*Chlidonias niger*	Marshes and lakes	BS, C, K, L, St, Sw, YM
Black-and-white Warbler	*Mniotilta varia*	Deciduous forests	BS, C, K, L, St, Sw, YM
Black-backed Woodpecker	*Picoides arcticus*	Mature forest	YM
Black-bellied Plover	*Pluvialis squatarola*	Lake shores, mud flats	BS, C, K, L, St, Sw, YM
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Moist thickets in low overgrown pastures and orchards	BS, C, K, L, St, Sw, YM
Black-billed Magpie	*Pica hudsonia*	Grasslands and savannah	BS, L, St
Blackburnian Warbler	*Dendroica fusca*	Coniferous forests	BS, C, K, L, St, Sw, YM
Black-capped Chickadee	*Poecile atricapillus*	Deciduous and mixed forests and open woodlands	BS, C, K, L, St, Sw, YM
Black-crowned Night-Heron	*Nycticorax nycticorax*	marshes and lakes	BS, C, K, L, St, Sw, YM
Black-headed grosbeak	*Pheucticus melanocephalus*	Deciduous forests	L
Black-necked Stilt	*Himantopus mexicanus*	Lakeshores and marshes	K, St
Blackpoll Warbler	*Dendroica striata),*	Coniferous forests	BS, C, K, L, St, Sw, YM
Black-throated Blue Warbler	*Dendroica caerulescens*	Mature forest	BS, C, K, L, St, YM
Black-throated Gray Warbler	*Dendroica nigrescens*	Mixed woodlands	L
Black-throated Green Warbler	*Dendroica virens*	Coniferous forests	BS, C, K, L, St, Sw, YM
Blue Grosbeak	*Guiraca caerulea*	Brushy areas, open woods, thickets & old fields	L, YM
Blue Jay	*Cyanocitta cristata*	Mixed and deciduous stands and parklands around inhabited areas	BS, C, K, L, St, Sw, YM
Blue-gray Gnatcatcher	*Polioptila caerulea*	Moist deciduous forests	BS, C, K, L, St, Sw, YM
Blue-headed Vireo	*Vireo solitarius*	mixed coniferous and deciduous forest	BS, C, K, L, St, Sw, YM
Blue-winged Teal	*Anas discors*	Marshes and lakeshores	BS, C, K, L, St, Sw, YM
Blue-winged Warbler	*Vermivora pinus*	Shrubland, old fields	K, L, YM
Bobolink	*Dolichonyx oryzivorus*	Grassland, prairie	BS, C, K, L, St, Sw, YM
Bohemian Waxwing	*Bombycilla garrulus*	Open coniferous forests	C, K,L, St, Sw, YM
Bonaparte's Gull	*Larus philadelphia*	Forested lakes and rivers	BS, C, K,L, St, Sw, YM
Boreal Chickadee	*Parus hudsonicus*	Coniferous forests	K, L, St, Sw, YM
Boreal Owl	*Aegolius funereas*	Coniferous forests	K
Brant	*Branta bernicla*	Rivers, marshes, estuaries	L

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Brewer's Blackbird	*Euphagus cyanocephalus*	Prairies, fields and farmyards	BS, C, K, L, St, Sw, YM
Broad-winged Hawk	*Buteo platypterus*	Deciduous woodlands	BS, C, K, L, St, Sw, YM
Brown Creeper	*Certhia americana*	Mixed coniferous forest	BS, C, K, L, St, Sw, YM
Brown Thrasher	*Toxostoma rufum*	Hedgerows and open forest	BS, C, K, L, St, Sw, YM
Brown-headed Cowbird	*Molothrus ater*	Grasslands and forest edges	BS, C, K, L, St, Sw, YM
Buff-breasted Sandpiper	*Tryngites subruficollis*	Prairies and grasslands	BS, C, K, L, St, Sw, YM
Bufflehead	*Bucephala albeola*	Wooded wetlands and ponds	BS, C, K, L, St, Sw, YM
Burrowing Owl	*Speotyto cunicularia*	Grasslands	BS, L, St, Sw, YM
Cackling Goose	*Branta hutchinsii*	Lakes and marshes	C, St
California Gull	*Larus californicus*	Lakes	BS
Canada Goose	*Branta canadensis*	Lakes and open water wetlands	BS, C, K, L, St, Sw, YM
Canada Warbler	*Wilsonia canadensis*	Moist mature forests	BS, C, K, L, St, Sw, YM
Canvasback	*Aythya valisineria*	pot holes, open marshes	BS, C, K, L, St, Sw, YM
Cape May Warbler	*Dendroica tigrina*	Open coniferous forests	BS, C, K, L, St, Sw, YM
Carolina Wren	*Thryothorus ludovicianus*	Woodland thickets, ravines and rocky slopes	K, L
Caspian Tern	*Sterne caspienne*	Rivers and streams	BS, C, K, L, St, Sw, YM
Cattle Egret	*Bubulcus ibis*	ponds, pasturelands	BS, C, K, L, St, Sw, YM
Cedar Waxwing	*Bombycilla cedrorum*	open woodlands, fields, gardens and yards	BS, C, K, L, St, Sw, YM
Cerulean Warbler	*Dendroica cerulea*	Deciduous forests	K
Chesnut-collared Longspur	*Calcarius ornatus*	Prairie	BS, C, K, L, St, Sw, YM
Chestnut-sided Warbler	*Dendroica pensylvanica*	open woodland and scrub	BS, C, K, L, St, Sw, YM
Chimney Swift	*Chaetura pelagica*	Nest in man-made structures	BS, C, K, L, St, Sw, YM
Chipping Sparrow	*Spizella passerina*	Open woods and fields	BS, C, K, L, St, Sw, YM
Cinnamon Teal	*Anas cyanoptera*	Shallow ponds, marshes, lakes	BS, C, K, L, St, Sw, YM
Clark's Grebe	*Aechmophorus clarkii*	Sloughs and shallow lakes with emergent vegetation	BS, K, L, St, YM
Clay-colored Sparrow	*Spizella pallida*	prairies	BS, C, K, L, St, Sw, YM
Cliff Swallow	*Petrochelidon pyrrhonata*	open country near cliffs	BS, C, K, L, St, Sw, YM
Common Goldeneye	*Bucephala clangula*	Mature forests near wetlands	BS, C, K, L, St, Sw, YM
Common Grackle	*Quiscalus quiscula*	Open areas with scattered trees	BS, C, K, L, St, Sw, YM
Common Loon	*Gavia immer*	Lakes and open water wetlands	BS, C, K, L, St, Sw, YM
Common Merganser	*Mergus merganse*	Marshes, shallow lakes and ponds	BS, C, K, L, St, Sw, YM

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Common Moorhen	*Gallinula chloropus*	Near marshes, lakes, ponds	C, K, L, St
Common Nighthawk	*Chordeiles minor*	Grasslands and open fields	BS, C, K, L, St, Sw, YM
Common Redpoll	*Carduelis flammea*	open fields, forest edges	BS, C, K, L, St, Sw, YM
Common Tern	*Sterna hirundo*	Lakeshores	BS, C, K, L, St, Sw, YM
Common Yellowthroat	*Geothlypis trichas*	Marshes and wetlands	BS, C, K, L, St, Sw, YM
Connecticut Warbler	*Oporornis agilis*	Forested wetlands	BS, C, K, L, St, YM
Cooper's Hawk	*Accipiter cooperii*	Dense deciduous and coniferous forests and riparian areas	BS, C, K, L, St, Sw, YM
Curlew Sandpiper	*Calidris ferruginea*	Mudflats	BS
Dark-eyed Junco	*Junco hyemalis*	Mixed open woods and brush	BS, C, K, L, St, Sw, YM
Dickcissel	*Spiza americana*	prairies, grasslands, pastureland	BS, C, K, L, St, Sw, YM
Double-crested Cormorant	*Phalacrocorax auritus*	Lakes, rivers, marshes	BS, C, K, L, St, Sw, YM
Downy Woodpecker	*Picoides pubescens*	Mixed woodlands and bottomland forests, forest edges	BS, C, K, L, St, Sw, YM
Dunlin	*Calidris alpina*	Wet meadows and ponds	BS, C, K, L, St, Sw, YM
Eared Grebe	*Podiceps nigricollis*	Open water with emergent vegetation	BS, C, K, L, St, Sw, YM
Eastern Bluebird	*Sialia sialis*	Grasslands and open woods	BS, C, K, L, St, Sw, YM
Eastern Kingbird	*Tyrannus tyrannus*	Open areas, forest edges	BS, C, K, L, St, Sw, YM
Eastern Meadowlark	*Sturnella magna*	Grasslands and prairies	C, K, L, Sw, YM
Eastern Phoebe	*Sayornis phoebe*	Open woodlands near streams	BS, C, K, L, St, Sw, YM
Eastern Screech-Owl	*Otus kennicotti*	Open woods, forest edges	BS, C, K, L, St, Sw, YM
Eastern Towhee	*Pipilo erythrophthalmus*	Open woods, forest edges	BS, C, K, L, St, Sw, YM
Eastern Wood-Pewee	*Contopus virens*	Open woods, forest edges	BS, C, K, L, St, Sw, YM
Eurasian Collared-Dove	*Streptopelia decaocto*	Parks, fields, farmland	BS, C, K, Sw
European Starling	*Sturnus vulgaris*	Open fields, farmland	BS, C, K, L, St, Sw, YM
Evening Grosbeak	*Coccothraustes vespertinus*	Coniferous forests	BS, C, K, L, St, Sw, YM
Ferruginous Hawk	*Buteo regalis*	Grassland, farmland	BS, C, K, L, St, YM
Field Sparrow	*Spizella pusilla*	Pastures and old fields	BS, C, K, L, St, Sw, YM
Forster's Tern	*Sterna forsteri*	Marshes	BS, C, K, L, St, Sw, YM
Fox Sparrow	*Passerella iliaca*	Forest edges and scrub areas	BS, C, K, L, St, Sw, YM
Franklin's Gull	*Larus pipixcan*	Lakeshores, marshes	BS, C, K, L, St, Sw, YM
Gadwall	*Anas strepera*	Marshes, rivers and ponds	BS, C, K, L, St, Sw, YM
Glaucous Gull	*Larus hyperboreus*	Large lakes	BS, K, L

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Golden Eagle	*Aquila chrysaetos*	Open and semi-open areas	BS, C, K, L, St, Sw, YM
Golden-crowned Kinglet	*Regulus satrapa*	Coniferous forests	BS, C, K, L, St, Sw, YM
Golden-crowned Sparrow	*Zonotrichia atricapilla*	Forest edges and scrub areas	C
Golden-winged Warbler	*Vermivora chrysoptera*	Woods and forest edges	K, L, Sw, YM
Grasshopper Sparrow	*Ammodramus savannarum*	Grasslands, farmlands	BS, C, K, L, St, Sw, YM
Gray Catbird	*Dumetella carolinensis*	Dense shrubby areas near forests and streams	BS, C, K, L, St, Sw, YM
Gray Jay	*Perisoreus canadensis*	Coniferous forests	L, Sw
Gray Partridge	*Perdix perdix*	Grasslands and farmlands	BS, C, K, L, St, Sw, YM
Gray-cheeked Thrush	*Catharus minimus*	Coniferous forests	BS, C, K, L, St, Sw, YM
Great Blue Heron	*Ardea herodias*	Lakes, rivers, marshes	BS, C, K, L, St, Sw, YM
Great Crested Flycatcher	*Myiarchus crinitus*	Open woods and mixed forest	BS, C, K, L, St, Sw, YM
Great Egret	*Ardea alba*	Lakes, rivers, marshes	BS, C, K, L, St, Sw, YM
Great Gray Owl	*Strix nebulosa*	Dense coniferous forests near wetlands	K, St
Great Horned Owl	*Bubo virginianus*	Woodlands	BS, C, K, L, St, Sw, YM
Great-tailed Grackle	*Quiscalus mexicanus*	Agricultural fields	L
Greater Prairie Chicken	*Tympanuchus cupido*	Mixed prairie	C, K, L, St
Greater Scaup	*Aythya marila*	Lakes and bogs near forest	BS, C, K, L, St, Sw, YM
Greater White-fronted Goose	*Anser albifrons*	Pot holes, ponds, grassland	BS, C, K, L, St, Sw, YM
Greater Yellowlegs	*Tringa melanoleuca*	Lakes, ponds, marshes	BS, C, K, L, St, Sw, YM
Green Heron	*Butorides virescens*	Lakes, rivers, marshes	BS, C, K, L, St, Sw, YM
Green-winged Teal	*Anas crecca*	Marshes and ponds	BS, C, K, L, St, Sw, YM
Groove-billed Ani	*Crotophaga sulcirostris*	Pastures, dry grasslands	BS, L
Gyrfalcon	*Falco rusticolus*	Open areas near river bluffs	BS, C, L
Hairy Woodpecker	*Picoides villosus*	Deciduous forests	BS, C, K, L, St, Sw, YM
Harlequin Duck	*Histrionicus histrionicus*	Wetland and riparian areas	BS, K, L
Harris's Sparrow	*Zonotrichia querula*	Wetlands and scrub areas	BS, C, K, L, St, Sw, YM
Henslow's Sparrow	*Ammodramus henslowii*	Grassland	BS, K, L, Sw
Hermit Thrush	*Catharus tuttatus*	Mixed forest	BS, C, K, L, St, Sw, YM
Hermit Warbler	*Dendroica occidentalis*	Coniferous forests	L

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Herring Gull	*Larus argentatus*	Lakes and rivers	BS, C, K, L, St, Sw, YM
Hoary Redpoll	*Carduelis hornemanni*	shrubby open areas	BS, K, St, L, Sw, YM
Hooded Merganser	*Lophodytes cucullatus*	Marshes and lakes	BS, C, K, L, St, Sw, YM
Hooded Warbler	*Wilsonia citrina*	Mature deciduous forests	L
Horned Grebe	*Podiceps auritus*	Lakes and ponds	BS, C, K, L, St, Sw, YM
Horned Lark	*Eremophila alpestris*	Grassland and farmland	BS, C, K, L, St, Sw, YM
House Finch	*Carpodacus mexicanus*	Developed areas, farmland, grassland	BS, C, K, L, St, Sw, YM
House Sparrow	*Passer domesticus*	Developed areas, farmland, grassland	BS, C, K, L, St, Sw, YM
House Wren	*Troglodytes aedon*	Developed areas, farmland, forest edges	BS, C, K, L, St, Sw, YM
Hudsonian Godwit	*Limosa haemastica*	Mudflats and wetland	BS, C, K, L, St, Sw, YM
Indigo Bunting	*Passerina cyanea*	Farmland, old fields	BS, C, K, L, St, Sw, YM
Kentucky Warbler	*Oporornis formosus*	Moist deciduous forests	K, L
Killdeer	*Charadrius vociferus*	Mudflats	BS, C, K, L, St, Sw, YM
King Eider	*Somateria spectabilis*	Pot holes, marshes	C
King Rail	*Rallus elegans*	Marshes and ponds	K, L, Sw
Lapland Longspur	*Calcarius lapponicus*	Prairies, pastures and wetlands	BS, C, K, L, St, Sw, YM
Lark Bunting	*Calamospiza melanocorys*	Prairies and grasslands	BS, C, L, YM
Lark Sparrow	*Chondestes grammacus*	Grasslands and savannah	BS, C, K, YM
Lazuli Bunting	*Passerina amoena*	Scrubby fields and riparian areas	K, L
LeConte's Sparrow	*Ammodramus leconteii*	Grasslands and wet meadows	BS, C, K, L, St, Sw, YM
Least Bittern	*Ixobrychus exilis*	Marshes	BS, C, K, L, St, Sw, YM
Least Flycatcher	*Empidonax minimus*	Mixed forests, marsh edges	BS, C, K, L, St, Sw, YM
Least Sandpiper	*Calidris minutilla*	marshes and wet meadows	BS, C, K, L, St, Sw, YM
Lesser Scaup	*Aythya affinis*	Marshes and ponds	BS, C, K, L, St, Sw, YM
Lesser Yellowlegs	*Tringa flavipes*	Open woods	BS, C, K, L, St, Sw, YM
Lincoln's Sparrow	*Melospiza lincolnii*	Marshes and wooded wetlands	BS, C, K, L St, Sw, YM
Little Blue Heron	*Egretta caerulea*	Marshes, lakes and ponds	BS, K, L, YM
Little Gull	*Larus minutus*	Lakes	BS
Loggerhead Shrike	*Lanius ludovicianus excubitorides*	Fields, savannah and open woods	BS, C, K, L, St, Sw, YM
Long-billed Curlew	*Numenius americanus*	Grasslands, prairies	K, L, Sw

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Long-billed Dowitcher	*Limnodromus scolopaceus*	Mudflats, marshes	BS, C, K, L, St, Sw, YM
Long-eared Owl	*Asio otus*	Open woods and forest edges	BS, C, K, L, Sw, YM
Long-tailed Duck	*Clangula hyemalis*	Marshes and lakes	BS, K, L, YM
MacGillivray's Warbler	*Opororni tolmiei*	Shrublands	L
Magnificent Hummingbird	*Eugenes fulgens*	Deciduous woods	L
Magnolia Warbler	*Dendroica magnolia*	Mixed coniferous woods	BS, C, K, L, St, Sw, YM
Mallard	*Anas platyrhynchos*	Marshes, lakes and ponds	BS, C, K, L, St, Sw, YM
Marbled Godwit	*Limosa fedoa*	Prairies	BS, C, K, L, St, Sw, YM
Marsh Wren	*Cistothorus palustris*	Marshes	BS, C, K, L, St, Sw, YM
Merlin	*Falco columbarius*	Prairies and coniferous forests	BS, C, K, L, St, Sw, YM
Mountain Bluebird	*Sialia currucoides*	Forest edges and grasslands	C, K, L, Sw
Mourning Dove	*Zenaida macroura*	Open woodland and grasslands, developed areas	BS, C, K, L, St, Sw, YM
Mourning Warbler	*Oporornis philadelphia*	Open woodlands and scrubland	BS, C, K, L, St, Sw, YM
Mute Swan	*Cygnus olor*	Lakes and ponds	Sw
Nashville Warbler	*Vermivora ruficapilla*	Forest edges	BS, C, K, L, St, Sw, YM
Nelson's Sharp-tailed Sparrow	*Ammodramus nelsoni*	Marshes and wet meadows	L, Sw
Neotropic Cormorant	*Phalacrocorax brasilianus*	Marshes	BS, L
Northern bobwhite	*Colinus virginianus*	Shrubland and agricultural land	L
Northern Cardinal	*Cardinalis cardinalis*	Forest edges and scrub areas	BS, C, K, L, St, Sw, YM
Northern Flicker	*Colaptes auratus*	Open woods and forest edges	BS, C, K, L, St, Sw, YM
Northern Goshawk	*Accipiter gentilis*	Coniferous forests	BS, K, L, St, Sw, YM
Northern Harrier	*Circus cyaneus*	Open fields, grasslands, wet meadows and marshes	BS, C, K, L, St, Sw, YM
Northern Hawk Owl	*Surnia ulula*	Coniferous forests	K, St
Northern Mockingbird	*Mimus polyglottos*	Forest edges and pastureland	BS, K, L, St, Sw, YM
Northern Parula	*Parula americana*	Moist forests	C, K, L, St, Sw, YM
Northern Pintail	*Anas acuta*	Pot holes, marshes	BS, C, K, L, St, Sw, YM
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	Open woods, grasslands	BS, C, K, L, St, Sw, YM
Northern Saw-whet Owl	*Aegolius acadicus*	Mixed forest	BS, C, K, L, St, YM
Northern Shoveler	*Anas clypeata*	Pot holes, marshes	BS, C, K, L, St, Sw, YM
Northern Shrike	*Lanius excubitor*	Open fields, grasslands	BS, C, K, L, St, Sw, YM

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Northern Waterthrush	*Seiurus noveboracensis*	Lakeshores, marshes, wooded wetlands	BS, C, K, L, St, Sw, YM
Olive-sided Flycatcher	*Contopus cooperi*	Woodlands	BS, C, K, L, St, Sw, YM
Orange-crowned Warbler	*Vermivora celata*	Shrubby mixed woodlands	BS, C, K, L, St, Sw, YM
Orchard Oriole	*Icterus spurius*	Deciduous riparian forests	BS, C, K, L, St, Sw, YM
Osprey	*Pandion halieatus*	Lakes and rivers	BS, C, K, L, St, Sw, YM
Ovenbird	*Seiurus aurocapilla*	mixed upland forests	BS, C, K, L, St, Sw, YM
Pacific Loon	*Gavia pacifica*	Lakes and ponds	K
Painted Bunting	*Passerina ciris*	Mixed shrubland/savannah	L
Palm Warbler	*Dendroica palmarum*	open grasslands	BS, C, K, L, St, Sw, YM
Pectoral Sandpiper	*Calidris melanotos*	Flooded areas, marshes, lakeshores	BS, C, K, L, St, Sw, YM
Peregrine Falcon	*Falco peregrinus*	Open grasslands and wetlands near cliffs	BS, C, K, L, St, Sw, YM
Philadelphia Vireo	*Vireo gilvus*	Open woodlands and riparian areas	BS, C, K, L, St, Sw, YM
Pied-billed Grebe	*Podilymbus podiceps*	Marshes and ponds	BS, C, K, L, St, Sw, YM
Pileated Woodpecker	*Dryocopus pileatus*	Mature forests	BS, C, K, L, St, Sw, YM
Pine Grosbeak	*Pinicola enucleator*	Coniferous forests	C, K, L, St, Sw, YM
Pine Siskin	*Carduelis pinus*	Coniferous forests	BS, C, K, L, St, Sw, YM
Pine Warbler	*Dendroica pinus*	Coniferous forests	BS, K, L, Sw
Piping Plover	*Charadrius melodus*	Lakes and ponds	BS, L, St, YM
Prairie Falcon	*Falco mexicanus*	Grasslands	BS, L, Sw, YM
Prothonotary Warbler	*Protonotaria citrea*	Bottomland and riparian forests	K, L, Sw
Purple Finch	*Carpodacus purpureus*	Coniferous forests	BS, C, K, L, St, Sw, YM
Purple Martin	*Progne subis*	Open woods and pastureland	BS, C, K, L, St, Sw, YM
Red Crossbill	*Loxia curvirostra*	Coniferous forests	BS, C, K, L, St, Sw, YM
Red Knot	*Calidris canutus*	Marshes	BS, K, L, St
Red-bellied Woodpecker	*Melanerpes carolinus*	open and moist woodlands	BS, C, K, L, St, Sw, YM
Red-breasted Merganser	*Mergus serrator*	lakes and ponds	BS, C, K, L, St, Sw, YM
Red-breasted Nuthatch	*Sitta canadensis*	Coniferous forests	BS, C, K, L, St, Sw, YM
Red-eyed Vireo	*Vireo olivaceus*	Deciduous forests	BS, C, K, L, St, Sw, YM
Redhead	*Aythya americana*	Lakes, ponds, marshes	BS, C, K, L, St, Sw
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Open woods and forest edges	BS, C, K, L, St, Sw, YM
Red-necked Grebe	*Podiceps grisegena*	Lakes and ponds	BS, C, K, L, St, Sw, YM

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Red-necked Phalarope	*Phalaropus lobatus*	Marshes and ponds	BS, K, L, St, Sw, YM
Red-shouldered Hawk	*Buteo lineatus*	Mature forests near lakes and streams	BS, C, K, L, St, Sw, YM
Red-tailed Hawk	*Buteo jamaicensis*	Grasslands and deciduous forests	BS, C, K, L, St, Sw, YM
Red-winged Blackbird	*Agelaius phoeniceus*	Marshes and wet meadows	BS, C, K, L, St, Sw, YM
Ring-billed Gull	*Larus delawarensis*	Lakes and rivers	BS, C, K, L, St, Sw, YM
Ring-necked Duck	*Aythya collaris*	Marshes	BS, C, K, L, St, Sw, YM
Ring-necked Pheasant	*Phasianus colchicus*	Farmland, old fields	BS, C, K, L, St, Sw, YM
Rock Pigeon	*Columba livia*	Dry rocky areas and urban zones	BS, C, K, L, St, Sw, YM
Rock Wren	*Salpinctes olbsoletus*	Rock outcrops	L
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	Open deciduous forests	BS, C, K, L, St, Sw, YM
Ross's Goose	*Chen rossii*	Marshes and ponds	BS, C, K, L, St, Sw, YM
Rough-legged Hawk	*Buteo lagopus*	Grasslands, farmlands, marshes	BS, C, K, L, St, Sw, YM
Ruby-crowned Kinglet	*Regulus calendula*	Mixed forests	BS, C, K, L, St, Sw, YM
Ruby-throated Hummingbird	*Archilochus colubris*	Mixed forests and forest edges	BS, C, K, L, St, Sw, YM
Ruddy Duck	*Oxyura jamaicensis*	Marshes, lakes, pot holes	BS, C, K, L, St, Sw, YM
Ruddy Turnstone	*Arenaria interpres*	Marshes, ponds	BS, C, K, L, St, Sw, YM
Ruff	*Philomachus pugnax*	Marshes and ponds	BS, K, L, St, YM
Ruffed Grouse	*Bonasa umbellus*	Open woods and scrub areas	K
Rusty Blackbird	*Euphagus carolinus*	swamps and riparian areas	BS, C, K, L, St, Sw, YM
Sabine's Gull	*Xema sabini*	Lakes, ponds	BS, K, L
Sage Thrasher	*Oreoscoptes montanus*	Brushy, scrub areas	YM
Sanderling	*Calidris alba*	lakes	BS, C, K, L, St, Sw, YM
Sandhill Crane	*Grus canadensis*	Wetlands mixed with shrubby uplands	BS, C, K, L, St, Sw, YM
Savannah Sparrow	*Passerculus sandwichensis*	Prairies, meadows and pastures	BS, C, K, L, St, Sw, YM
Say's Phoebe	*Sayornis saya*	Grasslands and shrubland	BS, L
Scarlet Tanager	*Piranga olivacea*	Woodlands	BS, C, K, L, St, Sw, YM
Scissor-tailed flycatcher	*Tyrannus forficatus*	Prairies and agricultural fields	L
Sedge Wren	*Cistothorus platensis*	Marshes and wet meadows	BS, C, K, L, St, Sw, YM
Semipalmated Plover	*Charadrius semipalmatus*	Mudflats, lakes and marshes	BS, C, K, L, St, Sw, YM
Semipalmated Sandpiper	*Calidris pusilla*	Lakes and marshes	BS, C, K, L, St, Sw, YM
Sharp-shinned Hawk	*Accipiter striatus*	Mixed forests	BS, C, K, L, St, Sw, YM

Common Name	Scientific Name	Habitat	Distribution*
Sharp-tailed Grouse	*Tympanuchus phasianellus*	Prairie	BS
Short-billed Dowitcher	*Limnodromus griseus*	Wooded wetlands and coniferous bogs	BS, C, K, L, St, Sw, YM
Short-eared Owl	*Asio flammeus*	Grassland	BS, C, K, L, St, Sw, YM
Smith's Longspur	*Calcarius pictus*	Forest edges and grasslands	BS, L, St, YM
Snow Bunting	*Plectrophenax nivalis*	Grassland and farmland	BS, C, K, L, St, Sw, YM
Snow Goose	*Chen caerulescens*	Marshes and agricultural fields	L
Snowy Egret	*Egretta thula*	Marshes and ponds	BS, K, L, St, YM
Snowy Owl	*Nyctea scandiaca*	Open fields and pastures	BS, C, K, L, St, Sw, YM
Snowy Plover	*Charadrius alexandrinus*	Shallow, sandy lakes	L
Solitary Sandpiper	*Tringa solitaria*	Ponds and marshes near coniferous forests	BS, C, K, L, St, Sw, YM
Song Sparrow	*Melospiza melodia*	Wet meadows, marshes and riparian areas	BS, C, K, L, St, Sw, YM
Sora	*Porzana carolina*	Marshes	BS, C, K, L, St, Sw, YM
Spotted Sandpiper	*Actitis macularius*	Marshes, lakes, rivers	BS, C, K, L, St, Sw, YM
Spotted Towhee	*Pipilo maculatus*	Forest edges and open woodlands	L, St
Sprague's Pipit	*Anthus spragueii*	Prairies	BS, L, St
Stilt Sandpiper	*Calidris himantopus*	Lakes and ponds	BS, C, K, L, St, Sw, YM
Summer Tanager	*Piranga rubra*	Mixed forests and forest edges	BS, K, L, St, Sw
Surf Scoter	*Melanitta perspicillata*	Ponds and marshes	BS, C, L
Swainson's Hawk	*Buteo swainsoni*	Grasslands and farmlands	BS, C, K, L, St, Sw, YM
Swainson's Thrush	*Catharus ustulatus*	Mixed forests	BS, C, K, L, St, Sw, YM
Swamp Sparrow	*Melospiza georgiana*	marshes and scrub-shrub wetlands	BS, C, K, L, St, Sw, YM
Tennessee Warbler	*Vermivora peregrina*	Mixed forests	BS, C, K, L, St, Sw, YM
Thayer's Gull	*Larus thayeri*	Lakes and rivers	BS, K
Townsend's Solitaire	*Myadestes townsendi*	Open woodlands	BS, C, K, L, St, Sw, YM
Townsend's Warbler	*Dendroica townsendi*	Coniferous forests	L
Tree Swallow	*Tachycineta bicolor*	Wooded areas near wetlands	BS, C, K, L, St, Sw, YM
Trumpeter Swan	*Cygnus buccinator*	Lakes, streams, marshes	BS, C, K, L, Sw
Tufted Titmouse	*Baelophos bicolor*	Mixed forests	C, K
Tundra Swan	*Cygnus columbianus*	Lakes and ponds	BS, C, K, L, St, Sw, YM
Turkey Vulture	*Cathartes aura*	Grasslands	BS, C, K, L, St, Sw, YM
Upland Sandpiper	*Bartramia longicauda*	Dry prairies	BS, C, K, L, St, Sw, YM
Varied Thrush	*Ixoreus naevius*	Moist coniferous forests	BS, C, K, St, Sw

Common Name	Scientific Name	Habitat	Distribution*
Veery	*Catharus fuscescens*	Bottomland and riparian forests	BS, C, K, L, St, Sw, YM
Vermilion Flycatcher	*Pyrocephalus rubinus*	Riparian forests	K
Vesper Sparrow	*Pooecetes gramineus*	Open grasslands and pastures	BS, C, K, L, St, Sw, YM
Virginia Rail	*Rallus limicola*	Marshes and ponds	BS, C, K, L, St, Sw, YM
Warbling Vireo	*Vireo gilvus*	Mixed forests	BS, C, K, L, St, Sw, YM
Western Grebe	*Aechmophorus occidentalis*	Lakes and ponds	BS, C, K, L, St, Sw, YM
Western Kingbird	*Tyrannus verticalis*	Grasslands and pastureland	BS, C, K, L, St, Sw, YM
Western Meadowlark	*Sturnella neglecta*	Grassland	BS, C, K, L, St, Sw, YM
Western Sandpiper	*Calidris mauri*	Mudflats and marshes	BS, L, Sw
Western Tanager	*Piranga ludoviciana*	Mixed forests	K, St
Whimbrel	*Numenius phaeopus*	Mudflats and marshes	BS, K, L
Whip-poor-will	*Caprimulgus vociferus*	Upland forests	BS, C, K, L, Sw, YM
White-breasted Nuthatch	*Sitta carolinensis*	Open woodlands	BS, C, K, L, St, Sw, YM
White-crowned Sparrow	*Zonotrichia leucophyrus*	Boreal forests	BS, C, K, L, St, Sw, YM
White-eyed Vireo	*Vireo olivaceus*	Upland forests	C
White-faced Ibis	*Plegadis chihi*	Marshes and flooded fields	BS, C, K, L, Sw
White-rumped Sandpiper	*Calidris fuscicollis*	Mudflats and marshes	BS, C, K, L, St, Sw, YM
White-throated Sparrow	*Zonotrichia albicollis*	Coniferous forests	BS, C, K, L, St, Sw, YM
White-winged Crossbill	*Loxia leucoptera*	Coniferous forests	BS, C, K, L, St, Sw, YM
White-winged Scoter	*Melanitta fusca*	Lakes	BS, K, L, Sw, YM
Wild Turkey	*Meleagris gallopavo*	Upland woods and grassland	BS, C, K, L, St, Sw, YM
Willet	*Catoptrophorus semipalmatus*	Marshes and grassland	BS, C, K, L, St, Sw, YM
Willow Flycatcher	*Empidonax traillii*	Riparian forests	BS, C, K, L, St, Sw, YM
Wilson's Phalarope	*Phalaropus tricolor*	Marshes, ponds and mudflats	BS, C, K, L, St, Sw, YM
Wilson's Warbler	*Wilsonia pusilla*	Moist forests and riparian areas	BS, C, K, L, St, Sw, YM
Wilson's Snipe	*Gallinago delicata*	Marshes, ponds and fresh meadows	BS, C, K, L, St, Sw, YM
Winter Wren	*Troglodytes troglodytes*	Mixed forests	BS, C, K, L, St, Sw, YM
Wood Duck	*Aix sponsa*	Forested wetlands and marshes near woods	BS, C, K, L, St, Sw, YM
Wood Thrush	*Hylocichla mustelina*	Deciduous forests	BS, C, K, L, St, Sw, YM
Worm-eating Warbler	*Helmintheros vermivorous*	Deciduous forests	K, L

Common Name	Scientific Name	Habitat	Distribution*
Yellow Rail	*Coturnicops noveboracensis*	Marshes and wet meadows	K, L
Yellow Warbler	*Dendroica petechia*	Riparian areas	BS, C, K, L, St, Sw, YM
Yellow-bellied Flycatcher	*Sphyrapicus varius*	Mixed forests	BS, C, K, L, St, Sw, YM
Yellow-bellied Sapsucker	*Sphyrapicus varius*	Mixed forests	BS, C, K, L, St, Sw, YM
Yellow-billed Cuckoo	*Coccyzus americanus*	Open woodlands	BS, C, K, L, Sw, YM
Yellow-breasted Chat	*Icteria virens*	Forest edges and riparian areas	BS, K, L, YM
Yellow-crowned Night-Heron	*Nyctanassa violacea*	Forested wetlands	BS, L, St
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	Marshes	BS, C, K, L, St, Sw, YM
Yellow-rumped Warbler	*Dendroica coronata*	Mixed forests	BS, C, K, L, St, Sw, YM
Yellow-throated Vireo	*Vireo flavifrons*	Forest edges	BS, C, K, L, St, Sw, YM
Yellow-throated Warbler	*Dendroica dominica*	Mixed forests	K

** - BS = Big Stone County, K = Kandiyohi County, L = Lac Qui Parle County Sw = Swift County, St = Stevens County, YM = Yellow Medicine County. No data was available for Chippewa County*

LIST OF DOCUMENTED REPTILE AND AMPHIBIAN SPECIES IN SOUTHWESTERN MINNESOTA (AS LISTED BY THE MINNESOTA HERPETOLOGICAL SOCIETY)

Common Name	Scientific Name	Habitat
American Toad	*Bufo americanus*	Woodlands, grasslands, developed areas
Bullsnake	*Pituophis catenifer*	Dry prairies and bluff lands
Canadian Toad	*Bufo hiophrys*	Wetlands, pastureland, forests, grasslands
Cope's Gray Treefrog	*Hyla chrysoscelis*	Prairies, grasslands, savannahs
Eastern Garter Snake	*Thamnophis sirtalis*	Grasslands and forest edges
Eastern Gray Treefrog	*Hyla versicolor*	Forest edges
False Map Turtle	*Graptemys pseudogeographica*	Slow flowing areas in large rivers
Five-lined Skink	*Eumeces fasciatus*	Granite outcroppings
Fox Snake	*Elaphe vulpina*	Forest edges, prairies, wet meadows
Great Plains Toad	*Bufo cognatus*	Grasslands
Milk Snake	*Lampropeltis triangulum*	Rocky outcrops
Mudpuppy	*Necturus maculosus*	Medium to large rivers and lakes
Northern Leopard Frog	*Rana pipiens*	Wetlands, lakes and streams
Northern Prairie Skink	*Eumeces sptentrionalis*	Dry prairies and grasslands
Plains Garter Snake	*Thamnophis radix*	Dry plains and grasslands
Redback Salamander	*Plethodon cinereus*	Upland mixed and coniferous forests*
Redbelly Snake	*Storeria occipitomaculata*	Woodlans near marshes or lakes
Smooth Softshell Turtle	*Apalone muticus muticus*	Rivers and streams with sandy or muddy bottoms
Snapping Turtle	*Chelydra serpentina*	Lakes, rivers, ponds and marshes
Spiny softshell Turtle	*Trionyx spiniferus*	Rivers, streams and large lakes with sandy or muddy bottoms
Tiger Salamander	*Ambystoma tigrinum*	Grasslands, pasturelands, forests near bodies of water
Western Chorus Frog	*Pseudacris triseriata*	Wetlands near woodlands
Western Hognose Snake	*Heterodon nasicus*	Dry prairies
Wood Frog	*Rana sylvatica*	Forested wetlands

**Only record near project area is an old, isolated record in Chippewa County along Minnesota River*

LIST OF DOCUMENTED FISH SPECIES IN PROJECT AREA (AS LISTED BY THE DNR)

Common Name	Scientific Name	Habitat
Bigmouth buffalo	Ictiobus cyprinellus	Species commonly found in lakes in route vicinity
Black bullhead	Ameiurus melas	Species commonly found in lakes in route vicinity
Black crappie	Pomoxis nigromaculatus	Species commonly found in lakes in route vicinity
Bluegill	Lepomis macrochirus	Species commonly found in lakes in route vicinity
Bowfin	Amia calva	Species commonly found in lakes in route vicinity
Brown bullhead	Ameiurus nebulosus	Species commonly found in lakes in route vicinity
Channel catfish	Ictalurus punctatus	Species commonly found in lakes in route vicinity
Common carp	Cyprinus carpio	Species commonly found in lakes in route vicinity
Freshwater drum	Aplodinotus grunniens	Species commonly found in lakes in route vicinity
Gar	Lepisosteidae family	Species commonly found in lakes in route vicinity
Golden shiner	Notemigonus crysoleucas	Species commonly found in lakes in route vicinity
Green sunfish	Lepomis cyanellus	Species commonly found in lakes in route vicinity
Largemouth bass	Micropterus salmoides	Species commonly found in lakes in route vicinity
Northern pike	Esox lucius	Species commonly found in lakes in route vicinity
Orange-spotted sunfish	Lepomis humilis	Species commonly found in lakes in route vicinity
Paddlefish	Polyodon spathula	Species commonly found in lakes in route vicinity
Pumpkinseed sunfish	Lepomis gibbosus	Species commonly found in lakes in route vicinity
Walleye	Stizostedion vitreum	Species commonly found in lakes in route vicinity
White sucker	Catostomus commersoni	Species commonly found in lakes in route vicinity
Yellow bullhead	Ameiurus natalis	Species commonly found in lakes in route vicinity
Yellow perch	Perca flavescens	Species commonly found in lakes in route vicinity

FISH SPECIES FOUND IN DNR RIVER SURVEYS (GRANITE FALLS ROUTES)

River (year of survey)	Fish Species Found
Canby Creek (1993)	Central stoneroller (Campostoma anomalum), common carp, brassy minnow, common shiner (Luxilus cornutus), hornyhead chub (Nocomis biguttatus), bigmouth shiner (Notropis dorsalis), rosyface shiner (Notropis rubellus), sand shiner (Notropis stramineus), bluntnose minnow, fathead minnow, blacknose dace (Rhinichthys atratulus), creek chub (Semotilius atromaculatus), white sucker, black bullhead, yellow bullhead, brook stickleback, green sunfish, orangespotted sunfish, Johnny darter, yellow perch, blackside darter, largemouth bass and northern pike
Florida Creek (1996)	Bigmouth shiner, black bullhead, blacknose dace, blackside darter, bluntnose minnow, brassy minnow, central stoneroller, common carp, common shiner, creek chub, fathead minnow, green sunfish, hornyhead chub, Iowa darter, Johnny darter, northern pike and white sucker
Lac qui Parle River (1994)	Central stoneroller, common carp, brassy minnow, common shiner, bigmouth shiner, sand shiner, bluntnose minnow, fathead minnow, blacknose dace, creek chub, white sucker, black bullhead, brook stickleback, Iowa darter, Johnny darter and yellow perch
Yellow Medicine River (1997) 1	Bigmouth buffalo, blackside darter, channel catfish, common carp, creek chub, fathead minnow, golden redhorse, goldeye (Hiodon alosoides), green sunfish, Johnny darter, northern pike, orangespotted sunfish, quillback, rock bass, sauger (Stizostedion canadense), shorthead redhorse, silver redhorse, slenderhead darter, spotfin shiner, walleye, white sucker, smallmouth bass and yellow perch.

FISH SPECIES FOUND IN DNR RIVER SURVEYS (MORRIS ROUTES)

River (year of survey)	Fish Species Found
Minnesota River (1998)	Bigmouth buffalo, black bullhead, black crappie, blacknose dace, blackside darter, bluegill, bluntnose minnow, channel catfish, common carp, common shiner, emerald shiner, fathead minnow, freshwater drum, golden redhorse, golden shiner, green sunfish, hornyhead chub, largemouth bass, northern pike, orangespotted sunfish, pumpkinseed, quillback, rock bass, shorthead redhorse, slenderhead darter, spottail shiner, stonecat, tadstructure madtom, walleye, white sucker, yellow bullhead and yellow perch
Stony Run Creek (1996)	Black bullhead, black crappie, blacknose dace, blackside darter, bluntnose minnow, brassy minnow, brook stickleback, central mudminnow (*Umbra limi*), common carp, common shiner, creek chub, emerald shiner, fathead minnow, golden shiner, green sunfish, hybrid sunfish (*Lepomis* hybrid), Iowa darter, Johnny darter, largemouth bass, northern pike, orangespotted sunfish, rosyface shiner, walleye, white sucker and yellow perch

FISH SPECIES FOUND IN DNR RIVER SURVEYS (WILLMAR ROUTES)

River (year of survey)	Fish Species Found
Pomme de Terre River (1998)	Blackside darter, common carp, common shiner, emerald shiner, fathead minnow, freshwater drum, Johnny darter, northern pike, orangespotted sunfish, sand shiner, shorthead redhorse, spotfin shiner, spottail shiner, walleye, white sucker and yellow perch
Stony Run Creek (1996)	Black bullhead, black crappie, blacknose dace, blackside darter, bluntnose minnow, brassy minnow, brook stickleback, central mudminnow (Umbra limi), common carp, common shiner, creek chub, emerald shiner, fathead minnow, golden shiner, green sunfish, hybrid sunfish (Lepomis hybrid), Iowa darter, Johnny darter, largemouth bass, northern pike, orangespotted sunfish, rosyface shiner, walleye, white sucker and yellow perch

APPENDIX N
AGENCY CORRESPONDENCE

APPENDIX O
LANDOWNER LIST

APPENDIX P
MEETING COMMENTS TABLES

GRANITE FALLS PRE-APPLICATION MEETING – AUGUST 1, 2005

Agriculture
Recommend that the routes follow roadway ROW and avoid cross country routes.
Transmission Line Route
Concern about poles being routed one mile from existing poles.
Preference for line to be routed along ¼ line to split easement between landowners.
Route Alternatives
Preference for rebuild of existing lines instead of adding new lines.
Process
Complaints indicating that the meeting announcement letter was confusing. Meeting format was not clearly described.
Map in mailing was too hard to read.
Complaint that overall process takes too long.
Purpose and Need
Attendee expressed general understanding of need for a line.
Landowner
What is the typical ROW and how much land does it take?
How are easement payments calculated?
Land Use
Why can't route go through governmental lands such as DNR designated lands?
Engineering
Preference for wood structures.
Is it possible to bury the line underground?
No preference for H-Frame versus single pole structures.
What is the optimal percent loading on a transmission line?
Visual
Concerned about view from bluff in Granite Falls.
What would a 345 kV line look like compared to a 230 kV line?
BSP Plant
The plant should be built at the existing NSP site in Granite Falls.
Public Safety
Concern about EMF health effects.

BENSON PRE-APPLICATION MEETING – AUGUST 2, 2005

Agriculture
Preference for single poles versus double pole structures on farmland.
Landowner does not want to farm around poles.
Preference for routing along roadway ROW to minimize conflicts with agriculture.
Will there be any adverse electrical affects on farm equipment?
Alternate Technology
Danvers is interested in Wind generation projects.
Swift County RDA is interested in economic development in Danvers, especially wind generation projects.
Transmission Line Route
Preference for routing along road south of Danvers.
Will the route follow a future cross country pipeline corridor in the area?
Preference for no routing along new Highway 12.
Landowner prefers south corridor.
Are the routes displayed at the meeting the final route selection?
Several attendees do not like the Willmar corridor.
Landowner
Landowner requested a more detailed question and answer sheet that describes easements and ROW payments.
When will landowner be contacted about easements?
How will payment work for easements?
Landowner does not want transmission line on his property.
Process
Request for overview maps at the meetings.
Request for larger section numbers on the maps.
When will the alternatives be decided?
Who makes the decision on where to put the line?
Why can’t the line be routed through DNR and Wildlife land?
Engineering
Will the transmission construction be similar to pipeline construction?
Has a decision been made about what type of structures will be used?
Attendee does not like steel pole construction.

Public Safety
What is a safe setback distance from residences?
What are the health effects associated with EMF and Stray Voltage?
Concern about line arcing and electrocution.
Noise
Landowner claiming that they can hear 115 kV line in their bedroom wants to know proposed setback distance from residences.
Signal Interference
Concern about interference with radio, GPS, television and pager signals.
Wildlife
Landowner has concerns about their CRP land off Highway 12 that has wildlife and pheasant habitats.

WILLMAR PRE-APPLICATION MEETING – AUGUST 3, 2005

Agriculture
Landowner just got rid of distribution line poles and does not want new poles on his farm land.
Do not use corridor 2B because farming is good to the south along the corridor.
Environmental
Less environmental impacts for lakes and wildlife for the corridor to the south of Willmar.
Wetlands/Riparian Areas
Many landowners concerned about impacts to Ringo Lake.
Avoid the wetlands in Alternative 2A.
Transmission Alternatives
Is the line from Hancock to Tera still being used?
Land Use
Environmental Learning Center and clay shooting range should be avoided in Dovre Township.
The county zoning north of Highway 12 has smaller parcels, which are primarily residential. South of Highway 12 is zoned in larger parcels for agriculture.
Landowner
Landowner concerned about project impact on property values.
Will the easements be permanent?
Landowner asked about easement payment amounts.
Landowner does not want line on his property.

Purpose and Need
Attendee claims that Willmar Police Department has been running their generator during peak flows to help with the city loads.
Attendee expressed need for line in Willmar.
Process
Will there be more public meetings?
Request for more road labels on maps.
The map and letter were very informative.
How can I be more involved in the process?
Why do the state and federal governments decide where the route should go?
Attendee liked the power point presentation on power loads.
Have any decisions been made in reference to the route?
It would be much easier to comment and get involved if they knew where the line was going to be routed.
Public Safety
Concerns about EMF and Stray Voltage
Concerns about the poles acting as lightning rods.
What is considered a safe distance for the transmission line from residences?
Concern about shock from overhead lines during misty weather.
Signal Interference
Concern about interference with TV, cell phone, wireless internet and UHF TV signals.
Concern about loss of two way radio near power lines.
Special Status
Bald eagle nest near home on Long Lake.
Engineering
How far can the span be between two poles?
Transmission Line Route
Where is the line going?
Dovre township board voted against putting power line through their area.
Why would new line to Willmar be considered over rebuild of line to Morris?
There is more demand for the line in Willmar than in Morris.
There is a higher concentration of people in Corridor 2A, therefore the route should follow corridor 2B.

CANBY PRE-APPLICATION MEETING – AUGUST 8, 2005

Agriculture
Preference for single poles in fields. Double poles are acceptable in pasture land.
Placing poles on center of section line is acceptable.
Alternate Technology
Can wind turbines be connected to HVTL?
Interest in development of wind generation in Canby area.
Landowners are not customers of the Applicants, therefore they would like to learn how wind generation will be affected by the project.
Have nuclear power options been explored instead of coal fired generation?
Can landowner connect wind turbine into 41.6 kV line?
Education needs to be provided on economies of scale regarding connection of wind projects into HVTL.
Air Quality
Concern about the mercury emission from BSP II
Environmental
Sportsman's club concerned about mercury emissions in MN River Valley.
Cultural/Historical
There is an old tee pee ring on the south side of U.S. Highway 75 near Looter's Pasture.
A historical railway trestle is located in Florida Township, Section 22.
Landowner
What are the benefits for landowners?
Public Safety
Which pole structure is more stable?
Process
The utilities will do what they want regardless of the process.
Can the transmission line be placed on state land?
Landowners received notification for land within and outside the corridor which caused confusion as to where the transmission line will be routed.
The line should be routed on land of project beneficiaries.
Engineering
Frontier Communications concerned about ground fault issues affecting their cables.
Vegetation
Who will be responsible for weed control along route?

ORTONVILLE PRE-APPLICATION MEETING – AUGUST 9, 2005

Agriculture
Single poles are preferred on agricultural lands.
Concern about stray voltage affecting livestock.
Concern about interference with irrigation systems between Big Stone and Willmar, especially with cross-country routes.
Alternate Technology
How will new transmission facilitate wind generation?
Duane Ninneman– program director for Cure – interested in being renewables partner (100 MW wind) for this project: duaneninneman1@yahoo.com; 114 South 1st Street West, Montevideo, MN 56265; Cell: 320-808-3101; phone: 320-269-2984; www.curemnriver.org Organized a group that holds regular meetings about renewables and wind. Have been talking to PUC who advised them to get involved in CON process. Would like to talk to Todd G. about involvement. Has tried to talk to OTP but hasn't found right contacts yet.
Air Quality
Concern about mercury emissions from BSP II.
Process
Opposition to transmission line being built in South Dakota because beneficiaries are located in Minnesota.
Reluctance to cooperate with the project because the project will not benefit landowner personally.
What are mechanisms to become involved in process?
Is there a website available to make comments?
Landowners in Vernon Township, South Dakota have not been notified.
Request for landowner list.
Signal Interference
Concern about television, radio, and wireless internet interference.
Socioeconomics
Milbank residents requested information about construction schedule and increased labor force to prepare for increased business at their establishments.
Engineering
Why can't existing 230 kV line in South Dakota be used?
Transmission Line Route
Support for Alternative 1
Avoid Highway 12 for Willmar option.
Suggestion to use Minnesota River Valley to Granite Falls.
Highway 7 is better than Highway 12.
Suggestion to route the line south along the common corridor and east along an existing transmission line.
Suggestion to route new line along existing Highway 12 route.

Landowner
Concern about loss of property value.

Visual
Concerned about visual impacts along Alternative 2 near hobby farms.
Concerns about visual impact of BSP II Stacks.

Comment Cards
Ed Linden, Spicer Minnesota; I prefer the route 2B – that you stay away from the wetland areas.
Edwin Fairchild, Canby, Minnesota; I will not agree to any easements on any land that I own. We don't want the thing here. Edwin Fairchild Florida Township
Gerald Velde, Granite Falls, Minnesota; We have three pole settings of your present line from Canby to Granite Falls in Hazel Run Twp. N ½ of NW ¼; S ¼ of NW ¼ Sec 25 115-40. I have no problem with poles placed on the same locations.
James Dyer, Spicer, Minnesota; I have spoken with a number of representatives here and I'm somewhat assured that the "data" exists in a realistic decision. Thanks for the opportunity. I would like to add, though, that in my area (Ring Lake) when the lines be run, there is a wildlife wetland area (where I suspect the line might go under that alternative). I also think that "re-education" should be a key component of this process – people should understand the impacts of their decisions. Just another comment – let the corn and soybeans look at the power lines.
Jerry Wersinger, Benson, Minnesota; Concerned as we have agricultural land in alternative 2 zone.
Jim Dokken, Willmar, Minnesota; CD on Load Reliability
Norman Beyer, Hancock, Minnesota; I would not want any lines or posts on my property. The legal description of my property is: Sect -26 Twp- 121 Rang -42 NE ¼ Moyer of Swift County.
Rick Pederson, Spicer, Minnesota; Interest in leasing land and/or investing in wind generators.
Rick Peterson, Spicer, Minnesota; As landowners southwest of Spicer, we are interested in any plans to incorporate wind generated electricity. We had two high ridges on our 100 acre farm that may be ideal to harvest wind energy. My brother Dave is the executive director of the Prairie Lakes Environmental Learning Center (320-354-5894) near Lake Florida. Dave shares my interest in Wind Systems. Please network us with people who share our interest.
Rita Klumper, Worthington, Minnesota; Effect on out telecommunications plant? I also mailed a mailing list request to Western Area Power Administration in Lakewood, CO

AERIAL BOARD COMMENTS FROM GRANITE FALLS, BENSON AND WILLMAR MEETINGS – AUGUST 1-3, 2005

General
Larry Norton owns land in Section 13, Dovre Township and is concerned about road access and power lines.
Thomas Linden owns land on Long Lake and is concerned about wetlands, visual, and property values.
Concerned about Proposed Corridor 2A- property value, wetlands. Along County Rd. 27 Long Lake and North.
Agriculture
Marysland and Six Mile Grove Townships have new center pivot irrigation being installed.
Cultural/Historical
Cemetery is in southwest corner of city of Hazel Run.
Oak Park Church cemetery in Fahlun Township.
Land Use
Need to check with the city regarding new sewage plant.
New ethanol plant along 212.
Prairie Woods Environmental Learning Center is in Dovre Township
Area southeast of city has been annexed by city for business park and a new Walmart has been proposed.
Clay shooting range is on the southern edge of the learning Center in Dovre Township
New airport being built. Old airport will become industrial park.
The old dump ground is in southern Granite Falls city limits.
A new substation is being proposed south of Spicer by Kandiyohi Co-op.
Air Strip is being built in Section 14 of Hazel Run Township. It will be a grass strip. Also building a new home on the site
Public Safety
Dunnick's Pit is an open pit and a safety issue. Have had many cars fall in off the road.
Signal Interference
UHF TV Tower is located in the southern portion of Dovre township.
Transmission Line Route
Nice prairie area south of old dump, just outside city limits of Granite Falls.
Jeff Isdal and Marlin Bergeson own 400 acres between Long Lake and Ringo Lake near the new road. They are concerned about the location of the corridor
New home is proposed on road between Ringo and Long Lakes.
One landowner preferred southern corridor around Willmar.
Vegetation
Section 16 of Six Mile Grove Township has a tree claim of 4 square acres.

AERIAL BOARD COMMENTS FROM CANBY AND ORTONVILLE MEETINGS – AUGUST 8-9, 2005

Cultural
Canby cultural resources individual identified railroad stone arch bridge trestle as possibly eligible per landowner.
Tee pee rings possibly exist south of the common corridor.
De Graff cemetery identified near Alternative 2.
Land Use
Williams pipeline identified near Alternative 2.
Agriculture
Landowner concerned about irrigation system on land.
Vegetation
Section 16 of Six Mile Grove Township has a tree claim of 4 square acres.
Recreation
Private hunting area near Alternative 1.
Environmental
Concern about rivers and streams in corridors.