ROUTE PERMIT APPLICATION FOR 161 KV HIGH VOLTAGE TRANSMISSION LINE

ECOHARMONY WEST WIND PROJECT

FILLMORE COUNTY, MINNESOTA

MPUC DOCKET NO. IP-6688/TL-09-601

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Table 1-1
Alternative Permitting Process Submission Requirements Checklist

Rule/Statute	Information Required	Location in Permit Application
Minn. R. 7849.5500, Subp. 1(C)	Subpart 1. **Eligible Projects**. An applicant for a site permit or a route permit for one of the following projects may elect to follow the procedures of parts 7849.5500 to 7849.5720 instead of the full permitting procedures in parts 7849.5200 to 7849.5340: high voltage transmission lines between 100 and 200 kV	Section 2.1
Minn. R. 7849.5500, subp. 2	Subpart 2. **Notice to COMMISSION**. An applicant for a permit for one of the qualifying projects in subpart 1, who intends to follow the procedures of parts 7849.5500 to 7849.5700, shall notify the Commission of such intent, in writing, at least 10 days before submitting an application for the project.	Section 2.4 and Appendix C
Minn. R. 7849.5530	**Contents of Application** (alternative permitting process). The applicant shall include in the application the same information required in part 7849.5220, except the applicant need not propose any alternative sites or routes to the preferred site or route. If the applicants shall include in the application the identity of the rejected sites or routes and an explanation of the reasons for rejecting them	See below for part 7849.5220, subp. 2, Section 4.2 for rejected alternative
Minn. R. 7849.5220, Subp. 2 (applicable per Minn. R. 7849.5530)	**Application Contents (HVTL)** (a) a statement of proposed ownership of the facility at the time of filing the application and after commercial operation	Section 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	Section 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	Not applicable
	(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	Sections 4.1 and 5.1
	(e) the environmental information required under 7849.5220, Subp. 3	See Minn. Rules 7849.5220, Subp. 3(a) – (h) entry in this table
	(f) identification of land uses and environmental conditions along the proposed routes	Section 6.0
	(g) the names of each owner whose property is within any of the proposed routes for the high voltage transmission line	Appendix A
	(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	Figure 2

Rule/Statute	Information Required	Location in Permit Application
	(i) identification of existing utility and public rights-of-way along or parallel to the proposed routes that have the potential to share right-of-way with the proposed line	Section 4.5, Figure 4
	(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	Section 5.0
	(k) cost analysis of each route, including the costs of construction , operating, and maintaining the high voltage transmission line that are dependent on design and route	Section 4.7
	(l) a description of possible design options to accommodate expansion of the high voltage transmission line in the future	Section 5.2
	(m) the procedures and practices proposed for the acquisition and restoration of the right-of-way, construction, and maintenance of the high voltage transmission line	Sections 5.3
	(n) a listing and brief description of federal, states, and local permits that may be required for the proposed high voltage transmission line	Section 4.8
	(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	Section 2.3
Minn. R. 7849.5220, Subp. 3	**Environmental Information** (a) a description of the environmental setting for each site or route	Section 6.1
	(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	Section 6.2
	(c) a description of the effects of the facility on land based economics, including, but not limited to, agriculture, forestry, tourism, and mining	Section 6.3
	(d) a description of the effects of the facility on archaeological and historic resources	Section 6.4
	(e) a description of the effects of the facility on the natural environment, including effects on air and water quality resources and the flora and fauna	Sections 6.5 and 6.6
	(f) a description of the effects of the facility on rare and unique natural resources	Section 6.7
	(g) identification of human and natural environmental effects that cannot be avoided if the facility is approved at a specific site or route	Section 7.13
	(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	Section 6.0 (Mitigation)

Rule/Statute	Information Required	Location in Permit Application
Minn. R. (7849.5240, Subp. 2 (applicable per Minn. R. 7849.5550)	**Notice of Project** Notification to persons on Commission's general list, to local officials, and to property owners	Will be mailed to required recipients within 15 days of application submission
Minn. R. 7849.5240, Subp. 4	Publication of notice in a legal newspaper of general circulation in each county in which the route is proposed to be located	Will be published within 15 days of application submission
Minn. R. 7849.5240, Subp. 5	Confirmation of notice by affidavits of mailing and publication with copies of the notices	Will be submitted within 30 days of notice mailing/publication
Minn. R. 78494.5910	**Factors to be Considered in Permitting a HVTL**	
	(a) effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services	Section 7.1
	(b) effects on public health and safety	Section 7.2
	(c) effects on land-based economics, including, but not limited to, agriculture, forestry, tourism, and mining	Section 7.3
	(d) effects on archaeological and historic resources	Section 7.4
	(e) effects on the natural environment, including effects on air and water quality resources and flora and fauna	Section 7.5
	(f) effects on rare and unique natural resources	Section 7.6
	(g) application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity	Section 7.7
	(h) use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries	Section 7.8
	(i) use of existing large electric power generating plant sites	Section 7.9
	(j) use of existing transportation, pipeline, and electrical transmission systems or rights-or-way	Section 7.10
	(k) electrical system reliability	Section 7.11
	(l) costs of constructing, operating, and maintaining the facility which are dependent on design and route	Section 7.12
	(m) adverse human and natural environmental effects which cannot be avoided	Section 7.13
	(n) irreversible and irretrievable commitments of resources	Section 7.14
Minn. R. 7849.5930, Subps. 1 and 2	Prohibited Routes **Wilderness areas**. No high voltage transmission line may be routed through state or national wilderness areas **Parks and natural areas**. No high voltage transmission line may be routed through state or national parks or state scientific and natural areas unless the transmission line would not materially damage or impair the purpose for which the area was designated and no feasible and prudent alternative exists. Economic considerations alone do not justify use of these areas for a high voltage transmission line	Not applicable

Rule/Statute	Information Required	Location in Permit Application
Minn. Stat. § 216E.03 Subd, 7(b) (applicable per Minn. Stat. § 216E.04, Subd. 8)	**Consideration in designating sites and routes** (1) Evaluation of research and investigations relating to the effects on land, water and air resources of large electric power, generating plants and high voltage transmission lines and the effects of water and air discharges and electric and magnetic fields resulting from such facilities on public health and welfare, vegetation, animals, materials and aesthetic values, including baseline 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	Sections 5.7, 6.0
	(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	Sections 4.5, 5.2, 7.7
	(3) Evaluation of the effects of new electric power generation and transmission technologies and systems related to power plants transmission – designed to minimize adverse environmental effects	Not applicable to transmission projects
	(4) Evaluation of potential for beneficial uses of waste energy from proposed large electric power generating plants	Not applicable to transmission projects
	(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	Sections 6.2.5 and 6.3
	(6) Evaluation of adverse direct and indirect environmental effects that cannot be avoided should the proposed site and route be accepted	Sections 6.2 through 6.6, Mitigation sections, 7.1 through 7.6, and 7.13
	(7) Evaluations of alternatives to the applicants proposed site or route proposed pursuant to subdivisions 1 and 2	Section 4.2
	(8) Evaluation of potential routes that would use or parallel existing railroad and highway rights-of-way	Sections 5.3, 7.8
	(9) Evaluation of governmental survey lines and other natural division lines of agricultural land so as to minimize interference with agricultural operations	Section 6.3.1 and Figure 4
	(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	Sections 4.5 and 7.7
	(11) Evaluation of irreversible and irretrievable commitments of resources should the proposed site or route be approved	Section 7.14
	(12) When appropriate, consideration of problems raised by other state and federal agencies and local entities	Section 4.8 Appendix B Appendix D

1.0 SUMMARY OF PROPOSED PROJECT

EcoHarmony West Wind, LLC, a Minnesota limited liability company (the Applicant), has proposed to construct a 200 to 280 megawatt (MW) wind project in Fillmore County, Minnesota. Figure 1 provides a general layout of the entire wind project, including the transmission line. The wind project will provide Minnesota and the region with clean, renewable wind energy in furtherance of Minnesota's and neighboring states' renewable energy objectives.

As part of the overall wind project, it is necessary to construct a transmission line to convey the energy from the turbines to the transmission grid. EcoHarmony West Wind has determined that a 161 kilovolt (kV) line is the appropriate voltage and that an eight and one-half mile long route in Bristol and Harmony Townships is the most appropriate location for that transmission line. Figure 2 presents a General Transmission Line Layout Map. The requested route width is 220 feet when the route follows a county road, 110 feet on either side of the county road. The ultimate right-of-way that will be required for the line, however, is only 50 to 100 feet. The rationale for this route width is described in Section 4.1 of this application.

A Route Permit from the Minnesota Public Utilities Commission (PUC) is required under Minnesota Statutes section 216E.03, subd. 2, to construct the proposed transmission line and related associated facilities. The proposed EcoHarmony West transmission line and associated facilities (the Project) for which a permit is being requested include:

- A new approximately 8 and one half mile long 161 kilovolt (kV) transmission line to transfer energy generated by the wind turbines to an interconnect point at an existing 161 kV transmission line, owned by ITC Midwest, near Harmony, Minnesota.

- A new Collector Substation called EcoHarmony West Substation in Bristol Township, Minnesota; and

- A new switching station in Harmony Township, Minnesota, at the point of interconnection to the transmission grid.

The new EcoHarmony West Substation will be a project collection substation. The electricity generated by all of the project turbines will be conveyed to the substation via underground electric cable. The proposed overhead transmission line will then carry the wind power to the Switching Substation, about eight and one-half miles away. The Switching Substation will be located immediately next to a 161 kV transmission line owned by ITC Midwest that runs generally north and

south from the Switching Substation. The location of the Switching Substation represents the point where energy from the wind project interconnects to the grid.

The Applicant has submitted separate applications to the PUC for a Certificate of Need and a Site Permit for the underlying wind project. Those applications are being considered by the Commission under separate dockets. PUC Dockets CN-08-961 and WS-08-973.

2.0 ALTERNATIVE PERMITTING PROCESS

2.1 Eligibility for Alternative Review

Because the proposed EcoHarmony West Transmission Line Project is under 200 kilovolts in size, it is eligible for review under the alternative review process established in Minnesota Statutes section 216E.04 and falls under the requirements established by the Commission in Minnesota Rules parts 7849.5500 to 7849.5720. Therefore, this permit application has been prepared in conformance with PUC alternative permit application requirements in Minnesota Rules part 7849.5520.

The basic difference between a permit application under the full process and the alternative process is that for the smaller transmission lines under the alternative process, an applicant need not have examined an alternative route to the route that is proposed. However, Minnesota Rules part 7849.5530 provides that if an applicant has examined an alternative route and rejected it, the applicant shall identify the rejected route and explain the reasons for rejecting it. EcoHarmony West Wind describes in Section 4.2 below an alternative route that was considered and the reasons for selecting the preferred route.

The Applicant has included a checklist near the front of this application indicating where in this document the information that is required to be included in a route permit application can be found.

2.2 Notification of Local Units of Government

Minnesota Statutes section 216E.04, subd. 3a, provides that at least 90 days before filing an application for a route permit for a transmission line in excess of 200 kilovolts, the applicant must provide notice to each local unit of government within which the route may be proposed describing the proposed project. That statute does not apply to this project because it is under 200 kV. Nonetheless, the Applicant here has had numerous contacts with local officials about the proposed Project.

EcoEnergy Wind, LLC has identified the following local units of government where the transmission line will traverse:

- Fillmore County (for occupying right-of-way along County Highway 44 and crossing County Highway 44)
- Bristol Township (for occupying right-of-way along County Highway 44 and private property)
- Harmony Township (for occupying right-of-way along County Highway 44, 120th Street and private property)

In anticipation of securing permits and to discuss the construction and operation of the EcoHarmony West Transmission Line Project, the Applicant has met with the following representatives of local government to discuss the wind farm and overhead transmission line:

- Mr. John Grindeland, Fillmore County Engineer, January 8, 2009
- Mr. Chris Graves, Fillmore County Zoning Administrator, March 27, 2009

In addition, EcoHarmony West Wind has sent a representative to the following township board meetings:

- Harmony Township Board Meeting, January 7, 2009
- Bristol Township Board Meeting, February 9, 2009

Letters related to the contacts the Applicant has had with local officials can be found in Appendix B.

2.3 Certificate of Need

A Certificate of Need for a 161 kV transmission line is only required if the line is over ten miles long or crosses the state border. Minnesota Statutes section 216B.2421, subd. 2(3). The proposed Project here is under ten miles in length and does not cross the state line since it is located entirely in Fillmore County, so a Certificate of Need is not required. A Certificate of Need is required for the underlying wind project, and EcoHarmony West Wind has applied for that certificate. PUC Docket No. IP-6688/CN-08-961.

2.4 Notice to the Commission

Minnesota Rules part 7849.5500, subd. 2, says an applicant who intends to seek a route permit under the alternative review process must notify the Public Utilities Commission of such intent at least ten days before

submitting the application. The Applicant notified the PUC of its intent to use the Alternative Permitting Process for the Proposed Project on May 15, 2009. (A copy of the notification letter is included in Appendix C).

3.0 OWNERSHIP

3.1 Proposed Ownership

EcoHarmony West Wind, LLC is a project-specific, special-purpose Limited Liability Compay. It is wholly owned by EcoEnergy Wind, LLC, a member of The Morse Group.

EcoEnergy Wind, LLC (hereinafter EcoEnergy) will develop the entire wind project, including the proposed transmission line, and manage the overall construction of the project. After initial development and engineering, it will seek Joint Venture partners to obtain project financing, secure a turbine supply, and contract for project construction. Upon commissioning of the wind project, the operation and maintenance of the project will be managed by a qualified third party operator.

3.2 Named Permittee

The Permittee on the Route Permit should be EcoHarmony West Wind, LLC. EcoHarmony West Wind may transfer the permit at some point but that entity is unknown at this time.

The following person is the primary contact person for the Applicant regarding this application and the transmission project:

Don Miller
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EcoEnergy Wind
725 Main Ave N
Harmony, MN 55939

4.0 THE TRANSMISSION LINE PROJECT

4.1 Proposed Transmission Line Route Description

The proposed transmission line starts at the site of a new EcoHarmony West Collector Substation in Bristol Township within a five acre parcel of land that was used for agricultural purposes. Figure 1 shows the entire wind project and the proposed transmission line. The transmission line originates from this substation and begins its route to a proposed Switching Substation located southeast of the City of Harmony. See Figure 2 for a general layout and topography of the transmission line route.

The requested width of the proposed route is 220 feet where the route parallels a county road or street, 110 feet on either side of the center line. This width is based on the part of the route that follows Fillmore County State Aid Highway 44 (CSAH 44). The CSAH 44 right of way is typically 120 feet wide. The proposed transmission line would be located within this right of way or within 50 feet of this right of way on one side of the highway or the other. The 120 foot right of way plus 50 feet on either side sums up to a 220 foot corridor. This width was then adopted as a standard width for that portion of the proposed route that parallels a county road or street.

Where the proposed line will be located on private easement that does not parallel a county road or street, such as at each end where it connects to a substation, and that portion of the line running south between CSAH 44 and 120th Street, EcoHarmony requests that the approved route be as wide as the property owned by the person whose land is crossed. That will provide flexibility for the owner and EcoHarmony to place the line along the mutually preferred route. In any event, the right-of-way ultimately required by EcoHarmony will be 50 to 100 feet.

The proposed route is more specifically described below. These specific segments are based on the original conceptual layout of the route. Most, but not all of the easements needed for the route as described below have been obtained. Until all the easements are obtained, the specific alignment is subject to change within the 220 foot wide route corridor requested. In addition, discussions with Fillmore County and Harmony Township in regard to placing the poles in the road's right of way are still underway. Pending these discussions, the final alignment may vary from the description below, but again, only within the 220 foot corridor width.

1. The EcoHarmony West Collector Substation will be located on the east side of Fillmore County State Aid Highway 15, approximately one half mile north of Fillmore County State Aid Highway 44.

(County State Aid Highways are referred to in this document as CSAH or just County Road.)

2. The transmission line leaves the Collector Substation and runs south on private easement, about 1\2 mile to County Road 44. Then it turns east and runs inside County Road 44 right-of-way to 271st Avenue.

3. Then it crosses to the south side of County Road 44 at 271st Ave.

4. From there it runs easterly on private easement along the south side of County Road 44 approximately 2 miles to a point one quarter mile east of County Road 17.

5. Where it crosses to the north side of County Road 44, one quarter mile east of County Road 17

6. It continues easterly on private easement along the north side of County Road 44 approximately 2 miles to 305th Avenue

7. Then crosses to the south side of County Road 44 at 305th Avenue and continues south on private easement approximately 1 mile to 120th Street

8. And continues east on private easement along the north side of 120th Street for approximately one quarter mile

9. Thence, east in the right-of-way of 120th Street for approximately 1.2 miles to Minnesota Highway 139

10. It crosses Minnesota Highway 139 diagonally to the south side of 120th Street

11. And runs east on the south side of 120th Street approximately three quarters of a mile on private easement

12. Where it crosses to the north side of 120th street and continues approximately ½ mile on private easement to the Switching Substation site.

13. The Switching Substation will be located adjacent to an existing 161 kV transmission line owned by ITC Midwest along 331st Avenue.

This proposed route follows existing road right-of-way along Fillmore CSAH 44 and Harmony Township's 120th Street for approximately six miles. Along the entire length of these routes, at least one side of the right-of-way is free of any existing overhead electric lines. The proposed route crosses from one side of the road to the other to avoid existing

electric distribution lines owned by Tri-County Electric Cooperative. EcoEnergy Wind has currently secured private easement along approximately 4 miles of these roadways. EcoEnergy is also in direct communication with both Fillmore County and Harmony Township in regard to placing all or parts of the transmission along these two roads in the public right-of-way. Both governmental units have expressed willingness to allow the transmission line in the public right-of-way as needed for the project. EcoEnergy Wind will continue to coordinate the exact pole locations with the private landowners, Fillmore County, and Harmony Township to the satisfaction of all parties.

4.1.1 List of Landowners

Minnesota Rules part 7849.5220, subp. 2.G, requires an applicant for a route permit for a high voltage transmission line to include in the application the names of each owner whose property is within the proposed route. The names of the landowners who are within the proposed route for this transmission line are found in Appendix A. (Note: the list does not include the names of spouses or other co-owners.)

4.1.2 Topographical Map

Minnesota Rules part 7849.5220, subp. 2.H, requires an applicant for a route permit for a high voltage transmission line to include in the application a topographical map showing the entire length of the proposed line. A topo map for this project is included as Figure 2.

4.2 Rejected Alternative Route

North Route vs. South Route

Early planning for a transmission line route considered the entire project boundary area. Initially, two general routes were identified. One route was a 'northern' route generally running in proximity to CSAH 20 and CSAH 22. A second 'southern' route was identified to run along the CSAH 44 corridor. Both routes are shown in Figure 3.

Field investigation of the northern route revealed difficulties in siting and constructing a transmission line in this area. There is not a continuous existing right-of-way through this area to easily follow. The route would require crossing open farm land which makes access and maintenance more difficult and impacts more acres of production land. The northern route would come into the City of Harmony along CSAH 22 and then wrap around the north and east sides of Harmony to reach the interconnect transmission line. This portion of the route already contains a number of transmission lines which would complicate construction of a new line. For these reasons, the northern route was deemed to be an impractical route and subsequent planning and attention was devoted to the southern route.

4.3 Proposed Collector Substation Description

The proposed EcoHarmony West Collector Substation will be located in Bristol Township, Minnesota, and would occupy approximately three acres in a parcel currently owned by the Bigalk Family Trust for agricultural purposes. Applicant intends to purchase an overall parcel of six to eight acres to provide room for roadside ditch, driveway, storm water pond, and grading purposes. The 161/34.5 kV substation will be designed to accommodate the incoming 34.5 kV collector lines and the outgoing 161 kV line. The substation design has not been completed at this time but will generally include the following components:

- Circuit breakers;
- High voltage switches;
- Steel structures to support the high voltage bus, switches and other miscellaneous equipment;
- Surge arresters;
- Ground grid;
- Power and control cable

- Control building
- Control panels
- DC battery system;
- AC station power;
- AC and DC station service panels;
- Communication panel;
- Crushed rock used as surfacing of the substation;
- Fencing around the facility, to restrict public access

Underground 34.5 kV collector lines will be run from the turbine groupings to this Collector Substation which is located near the geographic center of the wind farm.

4.4 Proposed Switching Station

The proposed Switching Station would be located on a three acre parcel along 331st street, southeast of Harmony, Minnesota, currently owned by the James Todd family for active agriculture. The switching station will be designed in collaboration with ITC Midwest, the owner of the interconnect line. The station will be designed to accommodate the proposed 161 kV lines and will include the following design components:

- 161 kV high voltage bus
- 161 kV Circuit breakers
- 161 kV High voltage switches
- Steel structures to support the high voltage bus, switches, and other misc. equipment
- Surge Arresters
- Ground grid
- Power and control cable
- Control building
    - Control Panels

- DC battery system
- AC station power
- AC & DC station service panels
- Communication panel

- Instrument transformers for protection and metering
- Control house for the substation control, relaying and communications equipment
- Concrete foundation to support the control house and electrical equipment
- Crushed rock used as surfacing of the switching station
- Fencing around the entire facility to restrict public access

The 161kV project transmission line will enter the switching station from the west while the existing ITC Midwest transmission line runs by the property in a north/south alignment. The existing transmission line will be rerouted into two separate breaker locations in the switching station.

4.5 Route and Substation Site Location Rationale

The site for the EcoHarmony West Collector Substation was selected for its location near the geographic center of the project. Preliminary micrositing of turbine locations and preliminary design of a collection system established a general area for locating the collection substation. Within the general area, the specific site was selected based on compatibility with the turbine and collection system layout, proximity to the Fillmore CSAH 44 corridor, and the absence of a site view impact on area residences.

Fillmore County Road 44 presents an excellent corridor for siting the transmission line. At least one side of the highway right-of-way is clear of existing overhead electric lines for the entire segment under consideration. Also there are relatively few homesteads to pass in this segment of County Road 44.

The proposed route turns south at 305th Avenue. It should be noted that 305th Avenue is a tee intersection with County Road 44 from the north. The land to the south of the intersection is agricultural land with no roadway or roadway easement. This is a fortuitous location to turn south for a number of reasons. Just east of 305th Avenue, a 161kV double pole

transmission line owned by Dairyland Power Company crosses CSAH 44 which is completely avoided.

Also, the land on both sides of County Road 44 up to 305th Avenue are signed up as participating lands in the wind farm project. Therefore, the landowners are willing to work with EcoEnergy in siting the transmission line. This is especially true of the agricultural land to the south of County Road 44. EcoEnergy has 100 foot wide transmission line easements across the open agricultural land in place. In crossing this agricultural land, the transmission line runs to 120th Street.

120th Street is a roadway owned by Harmony Township. EcoEnergy staff has met with Harmony Township officials to discuss the transmission line route. The Township is committed to working with EcoEnergy to site the transmission line either in or adjacent to the road right-of-way. After crossing the ag land the proposed route follows 120th Street right-of-way to the James Todd property where the Switching Substation will be located.

The Switching Substation location was selected due to its close proximity to the MISO interconnect line. The MISO interconnect line is a 161 kV transmission line owned by ITC Midwest. The EcoHarmony West project has queue position G746 for this interconnect and a System Impact Study for the project is currently underway. The James Todd family currently owns the property for the Switching Substation. The Applicant has entered into a perpetual easement with the Todds for placement of the Switching Station on their property.

In summary, the proposed transmission line route connects the collection substation to the Switching Substation at the MISO interconnect location. The route crosses open agricultural land as it leaves the collection substation, again when it turns south from CSAH. 44 to 120th Street, and also as it approaches the Switch Substation site. Otherwise, the transmission line will run along existing roadway corridor of CSAH. 44 and 120th Street either in private easement or inside the public right-of-way.

Existing Distribution Lines: In selecting the proposed transmission line route the first consideration was to avoid existing overhead electric distribution lines owned by Tri-County Electric. These distribution lines are generally located inside the road right-of-way along most of CSAH 44 and parts of 120th Street. EcoHarmony met with Tri-County Electric to discuss these lines. Tri-County Electric does not have any plans to replace these poles. It was decided the best outcome would be to avoid the Tri-County lines rather than build alongside them or to have EcoHarmony and Tri-County Electric share poles. Based on these discussions, the vast majority of the proposed route is located on the opposite side of CSAH 44

and 120th Street from the Tri-County distribution lines. There are several short segments along the route still under consideration for sharing poles with Tri-County Electric. EcoEnergy will continue to meet with Tri-County Electric and affected landowners to plan for the possibility of sharing poles on these segments.

Road Right-of-way: When locating transmission lines, public utilities, as well as wind companies, prefer to follow existing road right-of-way to the extent possible. Road right-of-way has been historically used for siting utilities as it provides an existing corridor for construction and maintenance. In recent years, some utility companies have begun to locate their facilities on private easement, just outside the road right-of-way. This is because utility lines inside the right-of-way must be moved at the owner's expense if the road authorities require relocation. For utility lines outside the road right-of-way, any relocations due to road improvements are paid for by the road authority.

There is no standard for deciding if a transmission line should be inside or outside the road right-of-way. EcoEnergy is aware of wind farm transmission lines in Mower County that are located inside the public road right-of-way. EcoEnergy has also constructed a wind farm in Illinois for which the project owner required the transmission line be on private easement.

The preliminary plan for this project was to set the transmission line in private easement to the extent possible. The primary reason for this was because some of the financial backers of wind projects demand private easement. However, in pursuing the private easements, a small number of properties were encountered for which private easements might not be readily obtained. For that reason, EcoHarmony is proposing that the transmission line be allowed inside the road right-of-way along those certain properties. (Figure 4 shows locations where public right-of-way easement is requested).

The Applicant fully understands that the transmission line can only be placed in the public right-of-way with approval from Fillmore County and Harmony Township. EcoHarmony has met with the Fillmore County Highway Engineer and the Harmony Township Board to discuss the transmission line in relation to the road right-of-way. Both parties indicated a willingness to cooperate with setting the poles in the road right-of-way if desired.

Homestead Conflicts: When electric transmission lines or distribution lines follow a road corridor, they invariably run past a homestead. Sometimes trees or other improvements at the homesteads are located in the road right-of-way or very close to it. To avoid negative impacts to the

homestead property, overhead electric lines will sometimes "cross the road" to avoid homesteads.

Along the proposed transmission line route, Tri-County Electric distribution lines have crossed the road to avoid two homesteads along CSAH 44. In each case this distribution line is located inside the CSAH 44 right-of-way. At these two locations, EcoEnergy may also prefer to "cross the road" and share a pole with the Tri-County Electric distribution line. In such event, a single pole inside the CSAH 44 right-of-way would carry both the EcoHarmony transmission line and the Tri-County Electric distribution line and thereby avoid poles in the homestead yards. This is a fairly common solution and Tri-County Electric has expressed a willingness to work with EcoEnergy in these types of situations.

These three general issues of: existing distribution lines; road right-of-way; and homestead conflicts were the basis of selecting the proposed route as presented in Figure 2.

4.6 Schedule

The proposed schedule for the transmission line, the substation, and the switching station construction are as follows:

- Completion of land acquisition for the transmission line – July 2009
- Completion of the Interconnection Studies – November 2009
- Permitting process complete – January 2010
- Start construction of the transmission line – June 2010
- Start construction of the substation – July 2010
- Start construction of the switching station – July 2010
- Completion of required MISO network upgrades – January 2011
- Energize EcoHarmony West Project Substation and transmission line – April 2011

4.7 Estimated Project Costs

EcoEnergy Wind has completed a preliminary cost estimate for the Project and estimates that the transmission line and substations will cost approximately $6.1 million. The estimated cost of each facility is a follows:

161 kV Transmission Line	$ 1,600,000

Collection Substation	$ 2,500,000
Switching Substation	$ 2,000,000
Total Project Cost	$6,100,000

Although not itemized, the cost of mitigation measures required under Minn. Rules part 7849.5220, Subp. 3(h), has been factored into the overall Project cost.

Since the transmission line and associated facilities will be new construction, the annual operating and maintenance expenses will be primarily inspection costs, which will be approximately $10,000 per year.

The proposed transmission line route and design were selected to help minimize construction costs and to facilitate operation and maintenance. Initial planning for the wind farm layout identified the relationship between the substation locations and the overhead transmission line. The location options for the Switching Substation are limited because it needs to be relatively close to the existing ITC-Midwest interconnect transmission line. The site selection for the Collector Substation balanced the desire for an efficient power collection system with the need for a feasible transmission line route to the interconnect line. Upon completing an initial micrositing of the turbines, it became apparent that the Fillmore CSAH 44 corridor was central to the wind farm layout. The decision to jog the route one mile south at 305th Avenue was based on the location of a Dairyland Power Company high voltage line crossing just to the east. Jogging the line one mile avoided the Dairyland line and set up a straight shot to the Switching Substation along 120th Street. Using these two roadway corridors minimizes the overall length of the line. The road rights-of-way also provide good access to the line for both construction and future maintenance. Minimizing the length of the line and using public right-of-way to access the line help to control lease costs, construction costs, and future maintenance costs.

4.8 List of Permits

Minnesota Rules part 7849.5220, subp. 2.N, requires that a list of federal, state, and local permits that may be required for the proposed transmission line must be included in the application. Table 4-1 on the following page summarizes the federal, state and local permits that may need to be obtained prior to construction of the proposed transmission line and substation facilities.

Table 4-1

List of Potential Required Permits and Jurisdictional Body

Permit Description	Jurisdiction
Preconstruction Notification	US Army Corps of Engineers
Route Permit (Alternative Process)	Minnesota PUC
NPDES Storm Water Permit for Construction	Minnesota Pollution Control Agency
Utility License Agreement / Line Crossing Permit	Minnesota Department of Transportation
Utility Crossing Public Water	Minnesota Department of Natural Resources
Utility License Agreement / Line Crossing Permit	Fillmore County Department of Transportation
Preconstruction Notification	Fillmore County Soil and Water Conservation District
Road Crossing Permit	Township, Fillmore County
Road Right-of-Way Use License	Township, Fillmore County
Driveway Access Permits	Township, Fillmore County
Over-width/Overweight Road Permit	Township, Fillmore County

4.8.1 Federal Permits

Preconstruction Notification – Army Corps of Engineers (ACOE)

Activities required for the construction, maintenance, repair, and removal of utility lines and associated facilities are covered under ACOE St. Paul District Regional General Permit (RGP-03-MN) under Paragraph G – Structural Discharges.

4.8.2 State Permits

Route Permit (Alternative Process) – Minnesota Public Utilities Commission (PUC)

A Route Permit from the PUC is required for the construction of high voltage transmission lines (HVTL), designating a route for the line. That is the permit that is being applied for in this application.

National Pollutant Discharge Elimination System (NPDES) – Minnesota Pollution Control Agency (MPCA)

Construction projects that disturb greater than one acre of land surface require an NPDES Storm Water Permit for construction activities. The Proposed Project would qualify for a General Permit under this program. Permit application submittals include submittal of a Storm Water Pollution Prevention Plan (SWPPP) that incorporates Best Management Practices (BMPs) to minimize discharge of pollutants from areas disturbed by construction.

Utility License Agreement / Line Crossing Permit – Minnesota Department of Transportation

Transmission or underground lines crossing State highways will require a DOT utility license agreement from Minnesota Department of Transportation. The Proposed Project will cross Minnesota State Highway 139.

Crossing Public Water Permit – Minnesota Department of Natural Resources (DNR)

Transmission lines crossing Public Waters require a crossing permit from the Minnesota DNR. The proposed project will cross Deer Creek.

4.8.3 County Permits

Utility License Agreement / Line Crossing Permit – Fillmore County Department of Transportation

Transmission or underground lines crossing county highways will require a DOT utility license agreement from Fillmore County Department of Transportation. The Proposed Project is expected to occupy segments of C.S.A.H. 44 right-of-way and to cross C.S.A.H. 44 at three locations.

Over-width/Overweight Load Permit

Permits may be required to move over-sized loads on county roads.

Preconstruction Notification – Fillmore County Soil and Water Conservation District

Fillmore County Soil and Water Conservation District may have jurisdiction over wetlands not covered by the state or federal jurisdictions.

4.8.4 Local Permits

The following local permits may be required prior to beginning construction of the Proposed Project:

Road Crossing and/or Road-Right-of-Way Permits

Road Crossing Permits may be required from Bristol and Harmony Townships to cross or occupy roadway rights-of-way.

Driveway Access Permit

A permit will be required from Fillmore County to provide driveway access to the Collector Substation off County Road 15. A permit will be required from Harmony Township to allow driveway access to the Switching Substation off of 331st Avenue.

Over-width/Overweight Load Permit

Permits may be required to move over-sized loads on county, city and/or township roads.

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

5.1 Transmission Line Structures

The typical structures along the route are proposed to be wood structures with braced posts (as shown in Figures 5-1 and 5-2). The structures will be 65-75 feet high and will be directly embedded in the ground. The average span between structures will be 350-400 feet. At some of the turns and at the ends, the structures will be galvanized or weathered steel (as shown in Figures 5-3 and 5-4). These structures will likely be somewhat taller, at 78 feet. The conductor will be 795 ACSR (Drake).

Table 5-1 below summarizes the structure design for the lines:

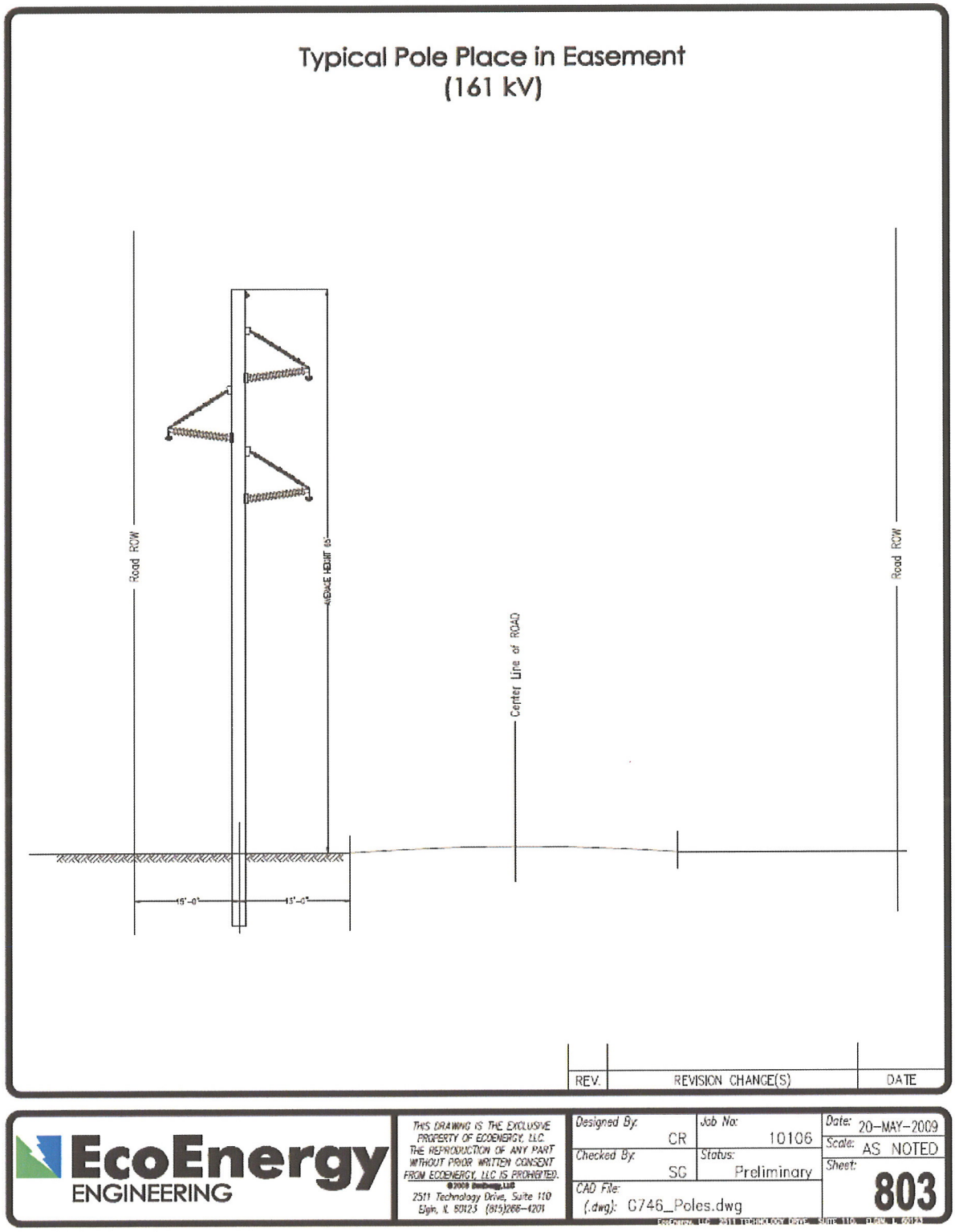
Table 5-1

Structure Design Summary

Line Voltage	161 kV
Structure Type	Braced Posts
Pole Type – Tangent	Wood
Pole Type – Large Angle and Dead-End	Steel
Conductor	795 ACSR (Drake)
Foundation	Directly Embedded
Double Circuit/Single Circuit	Single Circuit
Average Span (feet)	350 – 400 feet
Average Height (feet)	65 – 75 feet
Average Diameter (in)	30 inches

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

Figure 5.1


Typical Pole Place in Easement
(161 kV)
Road ROW
AVERAGE HEIGHT 85'
Center Line of ROAD
Road ROW
45'-0"
45'-0"
REV.
REVISION CHANGE(S)
DATE
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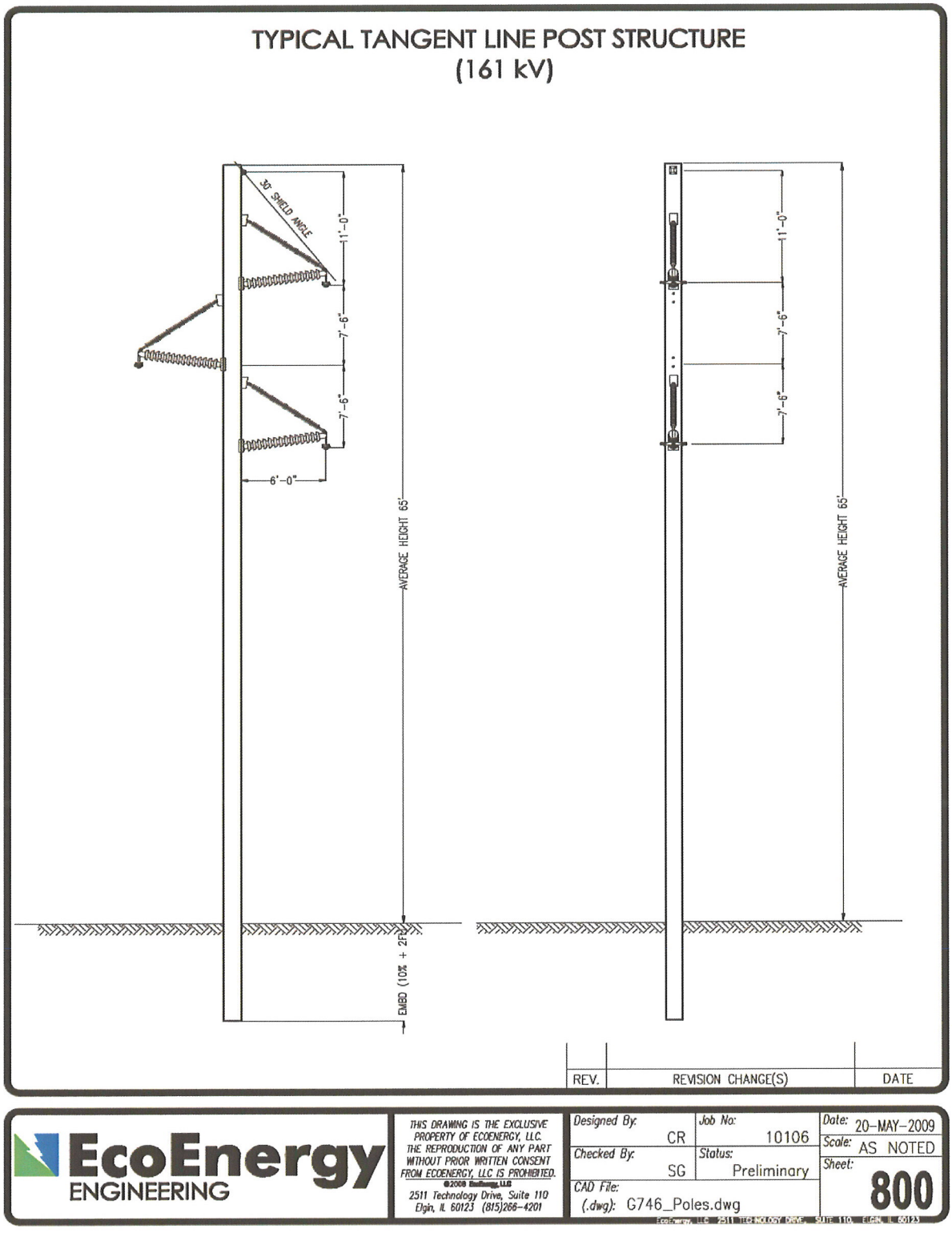
2511 Technology Drive, Suite 110
Elgin, IL 60123 (815)266-4201
Designed By: CR
Job No: 10106
Date: 20-MAY-2009
Checked By: SG
Status: Preliminary
Scale: AS NOTED
CAD File: (.dwg): G746_Poles.dwg
Sheet: 803

Figure 5.2


TYPICAL TANGENT LINE POST STRUCTURE
(161 kV)
30° SHIELD ANGLE
11'-0"
7'-6"
7'-6"
6'-0"
AVERAGE HEIGHT 65'
EMBED (10% + 2')
11'-0"
7'-6"
7'-6"
AVERAGE HEIGHT 65'
REV.
REVISION CHANGE(S)
DATE
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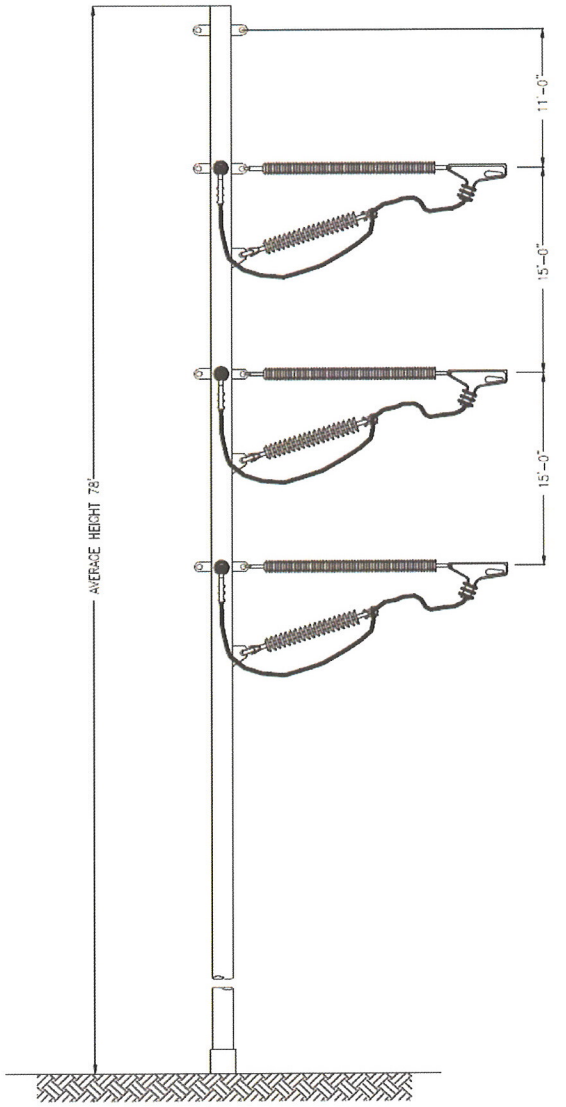
Status: Preliminary
Scale: AS NOTED
Sheet: 800
CAD File: (.dwg): G746_Poles.dwg
EcoEnergy, LLC 2511 TECHNOLOGY DRIVE SUITE 110 ELGIN, IL 60123

Figure 5.3

TYPICAL DEAD-END WITH JUMPER STRUCTURE
(161 kV)



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Designed By:	Job No:	Date:
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SG	Preliminary	AS NOTED
CAD File: (.dwg): G746_Poles.dwg		Sheet: 802

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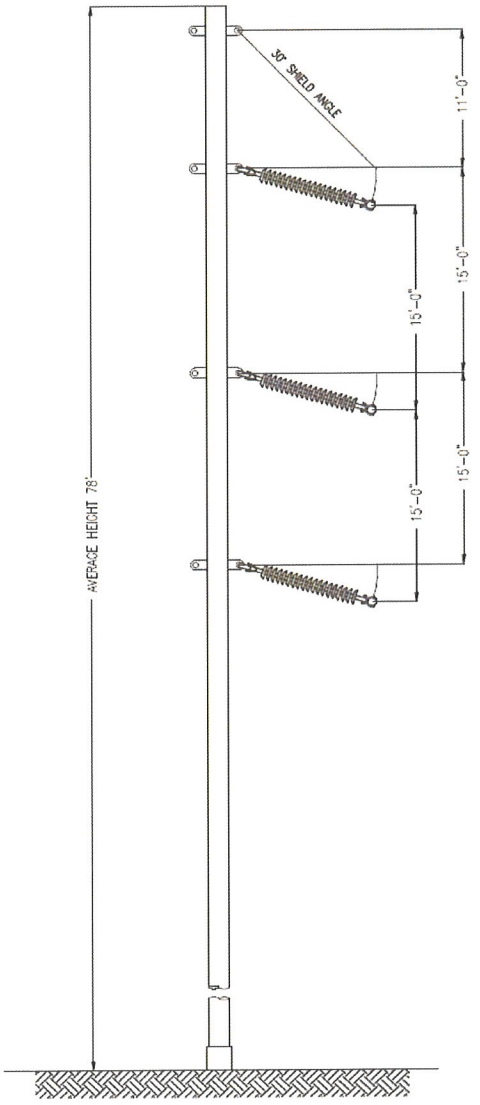
Figure 5.4

TYPICAL LARGE ANGLE SUSPENSION STRUCTURE
(161 kV)



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Designed By:	Job No:	Date:
CR	10106	20-MAY-2009
Checked By:	Status:	Scale:
SG	Preliminary	AS NOTED
CAD File: (.dwg): G746_Poles.dwg		Sheet: 801

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5.2 Possible Design Options for Expansion

There are no design options being considered to accommodate expansion of the line in the future. Expansion could involve either a double circuit (probably 161/161) or a higher voltage (230 kV), but neither option has been considered because both are unnecessary and would result in higher costs for a scenario that is unlikely to develop.

The proposed transmission line is intended to serve the EcoHarmony West Wind Project. The line will transmit electricity from the wind farm's Collector Substation to the point of interconnect at the project's Switching Substation. The line will be designed to convey up to 280 MW of electrical energy between these two points. The EcoHarmony West Wind Project will be permitted and constructed as a 200 to 280 MW facility. There are no plans or means to expand the wind farm beyond 280 MW. Therefore, it is not anticipated that this transmission line would be expanded in the future.

It is possible that the Switching Station on the east end of the line near the grid interconnect point could be used for purposes other than just collecting energy from the Collector Substation on the west end. However, in such event an entirely new transmission line could be required to carry energy to the Switching Station from some other location where energy is being generated.

5.3 Right-of-Way Acquisition

5.3.1 Collector Substation

The proposed EcoHarmony West Collector Substation on the west end of the transmission line will require up to ten acres. The proposed site is located in the Southwest quarter of Section 14, Township 101 North, Range 11 West in Fillmore County. The land adjoins County Road 15. The proposed site is presently owned by the Bruce R. Bigalk Family Trust. A Purchase Agreement for the land has been signed with the Trustees.

5.3.2 Switching Substation

The proposed switching station on the east end is located on land owned by James Todd. EcoEnergy has negotiated a perpetual easement agreement with the Todds for up to 6 acres located in the Southeast quarter of Section 23, Township 101 North, Range 10 West of Fillmore County. This site is immediately west of the proposed interconnection point along the ITC Midwest transmission line.

5.3.3 The Transmission Line

Existing Rights-of-way

As previously discussed, the majority of the proposed route follows the existing roadway corridor along Fillmore CSAH 44 and Harmony Township's 120th Street. EcoEnergy Wind has acquired easement agreements for most of the properties along these two roadways. These agreements provide for a 50 foot wide easement on the properties, along the road rights-of-way. There are currently three landowners along these roads that are not under easement agreement, but EcoEnergy has had positive discussions with two of the land owners and has been unable to contact the third. At these properties, if the Applicant is unsuccessful in negotiating a private easement agreement, then permission will be sought to place the transmission line in public road right-of-way.

If EcoEnergy is unable to obtain private easement for these properties, permit applications will be submitted to Fillmore County and Harmony Township to place the transmission line within the public road right-of-way along either Fillmore CSAH. 44 or Harmony Township 120th Street. EcoEnergy has held discussion with both Fillmore County and Harmony Township. Both governmental units have expressed a willingness to allow the transmission line inside the respective road rights-of-way. Both governmental units have a permit process to allow facilities inside their road right-of-way.

Agricultural Land

In addition to placement of transmission line along roadway corridors, approximately two miles of the line will cross private agricultural land in the following three locations:

From Collector Substation to Fillmore CSAH 44 – 1/2 Mile

The proposed transmission line would exit the Collector Substation site and run south approximately one half mile across existing agricultural land to Fillmore CSAH 44 and then turn east toward 271st Avenue. At 271st Ave, the transmission line will cross to the south side of CSAH 44. The transmission line would then turn east and run on private easement along the C.S.A. H. 44 corridor.

From CSAH 44 to 120th Street – One Mile

The proposed transmission line would follow the CSAH 44 corridor until 305th Avenue. At 305th Avenue the line would turn south and run across existing agricultural land for approximately one mile to 120th Street. One of the agricultural parcels is owned by Mr. Robert Vagts. The second is

owned by Mr. Rick Morem. EcoEnergy has signed lease agreements for both of these parcels.

From 120th Street to the Switching Substation – 1/2 Mile

The transmission line follows the 120th Street corridor to the Jim Todd property. The Switching Substation will be sited on the Todd property approximately one quarter mile north of 120th Street. The transmission line would cross agricultural land on the Todd property from the 120th Street corridor to the Switching Substation.

Road Crossings

Additionally, the proposed transmission line route will cross existing roads at a number of locations. The line will cross County Road 44 and 120th Street to avoid existing overhead electric distribution lines at the following locations:

CSAH 44: at 271st Street, just east of County Rd 17, and at 305th Ave

120th Street: at State Hwy 139 and one half mile east of State Hwy 139

The following roads will be crossed at existing intersections as the line runs west to east:

275th Avenue, 295th Avenue, and State Hwy 139.

Right-of-Way Crossing Permits will be secured for the appropriate road authority for these crossing permits.

5.4 Transmission Construction Procedures

Project construction will only commence after state and local approvals are obtained, property easements and route permits are acquired, soil conditions are established and final design is completed. Construction will follow standard construction and mitigation practices. These practices address staging, erecting transmission line structures and stringing transmission lines. Construction and mitigation practices to minimize impacts will be developed based on the proposed schedule for activities, permit requirements, prohibitions, maintenance guidelines, inspection procedures, terrain, and other practices and conditions.

Typical construction equipment used on a project consists of tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, front end loaders, bucket trucks, bulldozers, flatbed tractor-trailers, flatbed trucks, pickup trucks, concrete

trucks and various trailers. Many types of excavation equipment are set on wheel or track-driven vehicles. Poles are transported on tractor-trailers.

Efforts will be made to stage construction within the road ROW to the greatest extent possible. A three to five acre staging area will be required to store and handle materials. The Applicant will obtain temporary construction easements, as necessary.

After the construction contractor has mobilized his equipment and crews to the Project site, the poles are installed. The installation begins by moving the poles by truck from the staging areas to the staked location and placing them within the roadway ROW until the structures are set. Typically, access to the transmission line route is made directly from the existing roads or trails that run parallel or perpendicular to the transmission line route. Where the transmission line route does not parallel a road, access will be gained where the route crosses an existing road. Permission from the property owner is obtained prior to accessing the transmission line route. Where necessary to accommodate the heavy equipment used in construction, including cranes, cement trucks and hole drilling equipment, existing access roads may be upgraded or new roads may be constructed. New access roads may also be constructed when no current access is available or the existing access is inadequate to cross roadway ditches.

Most of the poles will be placed directly in the ground. Holes are drilled one to two feet larger than the base of the pole, the pole is placed in the hole, and the hole is then filled with granular material. In some locations culverts may be used in the hole to provide adequate support for the pole. Angle and dead end structures will be placed on concrete foundations. In those cases, holes will be drilled the diameter and depth of the foundation in preparation for the concrete, rebar and anchor bolts placed in the hole, and the hole filled with concrete. The concrete foundations may vary in size depending on soil conditions and final design of the pole foundations.

After the poles are set, the three conductors and shield wire are strung between the poles. The wire is typically strung in approximately two mile sections. The stringing equipment is set up within the permitted transmission line route. Access to each structure is required to attach the conductors to the insulators and shield wire to the clamps. Temporary guard structures are set at each road and other wire crossing to keep the wire off the crossing.

The proposed route does not impact any known environmentally sensitive areas or wetland areas. All work will be performed in accordance with the permits issued for the work (see Section 4.8). The use of established construction practices and the provisions of the corresponding permits will protect the topsoil, help prevent soil erosion, and ensure that proper

equipment fueling and lubricating methods are employed. Construction crews will maintain sound soil conservation practices during construction and operation of the facilities to protect topsoil and any adjacent storm waterways, and to minimize soil erosion. Crews will avoid major disturbance of drainage systems during construction.

5.5 Restoration Procedures

During construction, crews will attempt to limit ground disturbance wherever possible. However, areas are disturbed during the normal course of work, which can take several weeks in any one location. When construction is completed, disturbed areas are restored to their original condition to the maximum extent practicable. If damage has occurred to crops, fences, drain tiles, or the adjacent property, the Applicant will repair and/or fairly reimburse the landowner for the damages sustained. The Applicant will engage an outside contractor to restore the damaged property to as near as possible to its original condition. Portions of vegetation that are disturbed or removed during construction of transmission lines will naturally reestablish to pre-disturbance conditions. Resilient species of common grasses and shrubs typically reestablish with few problems after disturbance. Areas with significant soil compaction and disturbance from construction activities along the proposed transmission line route will require assistance in reestablishing the vegetation stratum and controlling soil erosion.

5.6 Maintenance Procedures

Transmission lines and substations are designed to operate for decades and require only moderate maintenance, particularly in the first few years of operation.

It is anticipated that maintenance of the line will be performed by an experienced contractor under a long-term service agreement including line inspection, equipment maintenance, and repairs. Vegetation growth will be monitored approximately every 5 years. If undesirable vegetation has become established that would affect the safe operation or maintenance of the line, the vegetation would be removed.

Substations require a certain amount of maintenance to keep them functioning in accordance with accepted operating parameters and the NESC requirements. Transformers, circuit breakers, batteries, protective relays, and other equipment need to be serviced periodically in accordance with the manufacturer's recommendation. The site itself must be kept free of vegetation and drainage maintained.

5.7 Electric and Magnetic Fields

The rules of the Public Utilities Commission relating to what must be included in an application for a Route Permit for a high voltage transmission line require an applicant to address the matter of electromagnetic fields (EMF) generated when an electric current travels along a wire. Minnesota Rules part 7849.5220, subp. 2.J. The Public Utilities Commission has addressed this issue in every Route Permit it has considered and has consistently found that there are no adverse health effects from EMF associated with transmission lines. Most recently, the PUC made the following finding in a proceeding involving a 161 kV line in Rochester, Minnesota.

> 39. There is insufficient evidence to demonstrate a causal relationship between EMF exposure and any adverse human health effects. On the basis of the most current information available from the World Health Organization and expert advice of the Minnesota Department of Health, no Minnesota regulations have been established pertaining to magnetic fields from HVTLs.

In the Matter of the Application of Rochester Public Utilities for a Route Permit for a 161 kV Transmission Line and Substation, PUC Docket No. E299/TL-07-1366, PUC Findings of Fact, Conclusions of Law and Order Issuing a Route Permit to Rochester Public Utilities for the Westside Transmission Line and Substation Project, August 7, 2008, para. 39, at page 7. The PUC also addressed the issue in the Environmental Assessment that was prepared as part of that proceeding, and will do so here in the Environmental Assessment on this project.

There is nothing unique about the transmission line proposed here that would cause it to be any different than other 161 kV lines from an EMF standpoint. Similar to other transmission lines of comparable size, no adverse health effects will be caused by the EcoHarmony West transmission line.

Nonetheless, in order to provide the reader with a background about EMF, the following discussion, taken from other applications and Environmental Assessments, is set forth.

5.7.1 Electric Fields

The flow of electricity on any wire (conductor) produces an electric field in the area surrounding the wire. The electric field associated with a high voltage transmission line 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 as one moves away from the transmission line. Nearby trees and building material also greatly reduce the strength of transmission line electric fields.

The intensity of electric fields is associated with the voltage of the transmission line and is measured in kilovolts per meter (kV/M). Transmission line electric fields near ground are designated by the difference in voltage between two points (usually 1 meter). For a 161 kV line, the maximum electric field, right under the line, is on the order of less than 1 kV/M. This is significantly less than the maximum limit of 8 kV/M which has been a permit condition imposed by the PUC in other High Voltage Transmission Line (HVTL) applications. The permit standard was designed to prevent serious hazard from shocks when touching large objects parked under extra HVTL of 345 kV or greater.

Table 5-2 below provides the electric fields at maximum conductor voltage for the proposed transmission lines reported by the PUC in its Environmental Assessment on the Rochester 161 kV line. Maximum conductor voltage is defined as the nominal voltage plus five percent.

Table 5-2 – Calculated Electric Fields (kV/m) for Proposed 161 kV Transmission Line (3.28 feet above ground)*

Type	Voltage	Distance to Proposed Centerline								
		300'	200'	100'	50'	0'	50'	100'	200'	300'
Single Circuit 161 kV	169 kV	0.01	0.02	0.09	0.28	0.71	0.29	0.09	0.02	0.01

*See Application for Rochester Northwest 161 kV Transmission Line and Westside Substation, at page 5-6, Dec. 14, 2007, PUC Docket No. E299/TL-07-1366.

5.7.2 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 a high voltage transmission line 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 milligauss (mG).

The calculated magnetic flux density table (see Table 5-3 below), provides the estimated peak magnetic fields based on the proposed lines and structure designs. The average magnetic field associated with the EcoHarmony West transmission line will be lower than these values. The expected magnetic fields for the structure type and voltage have been calculated at various distances from the center of the pole.

Table 5-3 - Calculated Magnetic Fields (milligauss) for Proposed 115 kV Transmission Line Design (3.28 feet above ground)*

Type	Condition	Distance to Proposed Centerline								
		-300'	-200'	-100'	-50'	0'	50'	100'	200'	300'
Single Circuit 161 kV	Peak	0.5	1.00	3.4	9.2	22.3	11	4.1	1.1	0.5

*See Application for Rochester Northwest 161 kV Transmission Line and Westside Substation, at page 5-8, Dec. 14, 2007, PUC Docket No. E299/TL-07-1366.

It can be noted that magnetic fields are not singularly associated with power lines. Every person has exposure to these fields to a greater or lesser extent throughout each day, whether at home or in schools and offices. Table 5-4 below contains field readings for a number of selected, commonly encountered items. These reading represent median readings, meaning one might expect to find an equal number of readings above and below these levels.

Table 5-4 Typical Magnetic Fields (mG) from Common Appliances

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

The National Institute of Environmental Health Science. *Electric and Magnetic Fields Associated with the Use of Electric Power.* June 2002: 34-36.

5.7.3 Stray Voltage

"Stray voltage" is a condition that can occur on the electric service entrances to buildings from distribution lines; it is not generally associated with transmission lines. More precisely, stray voltage is a voltage that exists between the neutral wire of the service entrance and grounded objects in buildings such as barns and milking parlors. Transmission lines do not, by themselves, create stray voltage because they do not connect to businesses or residences. Transmission lines, however, can induce stray voltage on a distribution circuit that is parallel to and immediately under the transmission line. Appropriate measures will be taken to prevent stray

voltage problems when the transmission lines proposed in this Application are parallel to or cross distribution lines.

5.7.3.1 Other Safety Precautions

Farm equipment, passenger vehicles and trucks may be safely used under and near power lines. The power line will be designed to meet or exceed minimum clearance requirements over roads, driveways, cultivated fields and grazing lands specified by the National Electric Safety Code (NESC). Recommended clearances within the NESC are designed to accommodate a relative vehicle height of 14 feet.

Insulated electric fences used in livestock operations can pick up an induced charge from transmission lines. Usually, the induced charge will drain off when the charger unit is connected to the fence. When the charger is disconnected either for maintenance or when the fence is being built, shocks may result. Potential shocks can be prevented by using the following methods: 1) one or more of the fence insulators can be shorted to the ground with a wire when the charger is disconnected or 2) an electric filter can be installed that grounds out charges induced from a power line while still allowing the fence charger to be effective.

There is a potential for vehicles under high voltage transmission lines to build up an electric charge. If this occurs, the vehicle can be grounded by attaching a grounding strap to the vehicle long enough to touch the earth. Such buildup is a rare event, however, because generally vehicles are effectively grounded through tires. Modern tires provide an electrical path to ground because carbon black, a good conductor of electricity, is added when they are produced. Metal parts of farming equipment are frequently in contact with the ground when plowing or engaging in various other activities. Therefore, vehicles will not normally build up a charge unless they have unusually old tires or are parked on dry rock, plastic, or other surfaces that insulate them from the ground.

Buildings are permitted near transmission lines but are generally prohibited within the ROW because a structure under a line may interfere with safe operation of the transmission facilities. For example, a fire in a building on the ROW could damage a transmission line. As a result, NESC guidelines establish clear zones for transmission facilities.

6.0 ENVIRONMENTAL ANALYSIS

6.1 Environmental Setting

The entire EcoHarmony West Wind Project, including the turbines, the transmission line, and the substations, lies in a rural location with farming, livestock grazing, and related agricultural operations dominating land use. Agricultural fields, farmsteads, fallow fields, and large open vistas visually dominate the area surrounding the wind project and the topography is relatively flat with gently rolling hills. The landscape can be classified as rural open space where the visual resources of the area are neither unique to the region nor entirely natural. Building sites in the vicinity of the Project are primarily residences and farm buildings (inhabited and uninhabited) surrounded by forested shelterbelts located along the rural county roads.

Additional information about the area in Fillmore County and potential environmental concerns related to the entire project can be found in the Site Permit Application in PUC Docket No. WS-08-973.

6.2 Human Settlement

6.2.1 Public Health and Safety

The Applicant will ensure that proper safeguards will be implemented for construction and operation of the facility. The Proposed Project would conform to all applicable local, state, and NESC standards regarding clearance to the ground, clearance to crossing utilities, clearance to buildings, strength of materials, and right-of-way widths. The proposed transmission line will be designed to meet or surpass all relevant local and state codes and North American Electric Reliability Council (NERC) standards. Appropriate standards will be met for construction and installation, and all applicable safety procedures will be followed during and after installation. 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 was to occur and a structure or conductor on the transmission line was to fall to the ground. The protective devices are breakers and relays located where the line connects to the substation. This equipment will de-energize the transmission line should an event such as this occur.

Airport Safety. The nearest public airport is the Fillmore County Airport in Section 32 of Fountain Township (T-103-N, R-11–W). This airport is about four miles east of Preston and about four miles from the northwesterly boundary of the wind project and almost ten miles from the Collector Substation on the west end of the proposed transmission line. No impacts to the operation of the airport are anticipated from the transmission line at these distances. Nonetheless, EcoEnergy will contact the Federal Aviation Administration (FAA) and file a Notice of Proposed Construction or Alteration (FAA Form 7460-1) with the FAA if necessary.

6.2.2 Displacement

No person will be displaced as a result of construction of the proposed transmission line.

6.2.3 Noise

The entire EcoHarmony West Wind Project, including the transmission line that is the subject to this proceeding, is located in a rural, predominantly agricultural area. Sources of background noise audible to rural residents and visitors to the area include wind, agricultural activity, recreation (primarily hunting), and vehicles. General noise level data from the USEPA and National Transit Institute were used to provide a typical sound level range for rural residential and agricultural cropland uses. Typical baseline average day-night sound levels measured in A-weighted decibels [dB(A)] near the Project likely range from approximately 38 dB(A) to 48 dB(A) (USEPA 1978). These are relatively low background levels and are generally representative of the site. Higher levels exist near roads and other areas of human activity. The windy conditions in this region may elevate ambient noise levels relative to rural areas with less wind.

Table 6.1. Comparative Sound Levels

Source/Activity	Indicative noise level dB (A)
Threshold of hearing	0
Rural night-time background	20-40
Quiet bedroom	35
Wind farm at 350m	35-45
Car at 40mph at 100m	55
Busy general office	60
Truck at 30mph at 100m	65
Pneumatic drill at 7m	95
Jet aircraft at 250m	105
Threshold of pain	140

Source: The Scottish Office, Environment Department, Planning Advice Note, PAN 45, Annex A: Wind Power, A.27. Renewable Energy Technologies, August 1994. Cited in "Noise from Wind Turbines," British Wind Energy Association, http://www.britishwindenergy.co.uk/ref/noise.html .

Background noise levels in the Project area are typical of those in rural settings, where existing nighttime noise levels are commonly in the low to mid-30 dBA. The dBA scale is A-weighted decibels based on the range of human hearing. Low to mid-30 dBA are relatively low background levels and are generally representative of the site. Higher levels exist near roads and other areas of human activity. The windy conditions in this region tend to increase ambient noise levels compared to other rural areas.

Impacts

Noise is defined as any unwanted sound. Noise can have such subjective effects as annoyance, nuisance, and dissatisfaction, and can also interfere with activities such as speech, sleep, and learning. Physiological effects such as anxiety, tinnitus, or hearing loss can also occur as a result of noise exposure. Contribution to hearing loss can begin at levels as low as 70 dB(A).

The National Safety Council (NSC) recommends no more than 85 dB(A) for eight hours of exposure as the safe limit for farm operations. Industrial standards of the Occupational Safety and Health Administration (OSHA) regulations would apply during construction, operation, and maintenance of the facility. Short-term noise issues would be related to construction of the Project; long-term issues would be related to operation of the facility. Noise generated by construction activities would occur intermittently over the construction period during daytime hours and would be generated by an increase in traffic on local roads, as well as heavy equipment operation. Available estimates from other construction projects indicate that the maximum noise levels from heavy equipment would be 85 to 88 dB(A) at a distance of 50 feet (Western 2003).

During operation of the Project, noise will be emitted by the HVTL and substation. Corona-generated audible noise from HVTL operation is generally characterized as a crackling, hissing noise. The noise is most noticeable during wet-conductor conditions such as rain, snow, or fog. The average noise-level during wet weather at the edge of the ROW for the proposed HVTL is expected to be less than 45 dB(A). The noise (L_{50}) standard is 50 dB(A) for nighttime (Minn. Rule 7030.0040). Noise from a typical substation with transformers is less than 65 dB(A); however, the closest residence to the new collection substation is more than one quartermile away. Noise from the Switching Substation will be less than the collection substation because there will be no transformers. The closest residence to the Switching Substation is approximately one third of a mile away. Given the distance of residences from the HVTL and substations, the noise standards will be met.

Mitigative Measures

Noise impacts to nearby residents and other potentially affected parties were taken into consideration as part of the siting of the HVTL route. Therefore, no mitigation measures are proposed.

6.2.4 Aesthetics

EcoEnergy gave consideration to aesthetic impacts in the initial planning for both the transmission line route and substation sites. The transmission line route generally follows existing roadway corridor. People are accustomed to seeing utility poles along the road and accept them as part of the roadway corridor. In addition, EcoEnergy is pursuing private property easement for the route and thereby informing adjacent landowners of the aesthetic impact in the process.

There are twelve occupied residences that are within 1200 feet of the proposed corridor. Not all of these residents will have structures on their property. All residences where the preferred transmission line location will pass between the house and the roadway have been contacted about private easement for the project. EcoHarmony anticipates that it will enter into an easement agreement with each of these homeowners. For the most part, existing electrical distribution lines run along the proposed route such that residents are already familiar with overhead utility lines.

Table 6.2 below lists the twelve residences along the route. The table also indicates the distance of the residences to the proposed transmission line alignment. Figure 4 shows the location of the residences along and near the proposed route.

Table 6.2 Distance to Nearest Residences

Residence No.	Address	Located near		Distance from residence to proposed line (ft)
		CSAH 44	120th St	
1	12994 County 15	X		1214
2	26904 County 44	X		148
3	28209 County 44	X		192
4	28592 County 44	X		414
5	28773 County 44	X		158
6	29093 County 44	X		53
7	30326 County 44	X		550
8	30472 120th St		X	779
9	31089 120th St		X	1019
10	31316 120th St		X	322
11	11891 Hwy 139		X	409
12	32876 120th St		X	342

The Collector Substation was selected in part because the site is effectively screened from the view of the nearest homesteads. The easement agreement for the Switching Substation includes a provision for vegetative screening at the facility if desired by the landowner. These considerations will be carried through to the final planning and design of the transmission line project to help minimize overall aesthetic impacts. The nearest residence to each substation site is at least one quarter mile from the site.

Impacts

Construction of the transmission line and substation will create a visual impact. The line will consist of a series of single pole structures to support three electric cables. The poles will be located within approximately three to five feet of the road right-of-way along CSAH 44 and 120th Street. Both the CSAH 44 and 120th Street corridors do contain existing overhead electric lines on one side of the roads. This project will result in an additional line of poles and overhead cable along the roads. In addition, the proposed route does include three segments that are not along a road but cross agricultural land. In these segments, the pole line will be placed in private easement along property lines. The longest of these segments is approximately one mile in length, running between CSAH 44 and 120th Street. A large portion of this mile includes mature trees on the property line, therefore the trees will mask the pole line to decrease its overall visibility on the landscape. The substation sites will cover

approximately five to seven acres each. The sites will be graded relatively flat. The final Facility will include a chain link fence around the site perimeter for safety. The equipment inside the fence will be similar to other electrical substations.

Mitigative Measures

The primary mitigative measure for the transmission line is to construct the pole line within or adjacent to existing roadway corridors. Roadway corridors often host overhead electric lines and the public is used to seeing these lines along roads. Siting the line along the road corridors instead of across open land results in a much less noticeable visual impact.

Where the line must pass existing homesteads, EcoEnergy is committed to working with the homeowners to site poles in a manner to avoid major visual impact on the property. If a homeowner objects to the line, every effort will be made to locate the line on the opposite side of the road.

The one mile stretch of transmission line to be constructed across county will be located as close as possible to the existing property line and existing trees and wooded area. The line will not "cut-through" a wooded area so only a minimum of trees will be removed as a result of the project.

The substation sites were chosen in part based on visual impact to nearby residences. The nearest residence for each substation location is at least one quarter mile from the site. In addition, mature trees around the homesteds generally provide a vegetative screening between the house and the substation sites.

6.2.5 Socioeconomic

The 2000 U.S. Census reports that there were 21,122 people, 8,228 households, and 5,718 families residing in the county. The population density was 24 people per square mile (9/km^2). There were 8,908 housing units at an average density of 10 per square mile (4/km^2).

The Census Bureau also reported the economic situation of Fillmore County: median income for a household was $36,651, and the median income for a family was $44,883. The per capita income for the county was $17,067. About 6.80% of families and 10.10% of the population were below the poverty level, including 14.40% of those under age 18 and 11.20% of those aged 65 or over. The job activity associated with the project's construction phase and the long-term turbine land-lease payments associated with the wind farm, will have a positive impact on the local economy.

Impacts

Short-term impacts to socioeconomic resources will be relatively minor. The vast majority of the project area is comprised of agricultural lands. Since the poles will be placed near the road right-of-way or fence lines, virtually no land will be taken out of production as a result of the line. Landowner compensation will be established by an easement agreement, and the areas surrounding each pole may still be farmed. Project construction will not cause additional impacts to any industries within the Project area.

The proposed transmission line route does not pass in proximity to any existing population centers. Although the line will run past existing homesteads, it will not significantly impact these homesteads. The line will not prevent future development of parcels along the route.

EcoHarmony estimates that at least 15 temporary jobs will be created during the construction phase. After construction, the wind farm will provide 8 to 12 permanent technical and professional jobs to operate the project. Local contractors and suppliers will be used for portions of the construction. Total wages and salaries paid to contractors and workers in Fillmore County will contribute to the total personal income of the region. Expenditures made for equipment, fuel, operating supplies, and other products and services benefit businesses in the county and the state. Additional personal income will be generated for residents in the county and state by circulation and recirculation of dollars paid out by the Applicant for business expenditures and for state and local taxes. All these payments diversify and strengthen the local economy.

The development of wind energy has been found to be important in diversifying and strengthening the local economic base in other areas of the state. Northwest Economic Associates prepared a report, "Assessing the Economic Development Impacts of Wind Power," that included a case study of the Lake Benton I wind project in Lincoln County, Minnesota. NEA found that wind development had positive ramifications on the local economy.

Mitigative Measures

Socioeconomic impacts associated with the Project will be primarily positive with an influx of wages and expenditures made at local businesses during Project construction and an increase in the county's tax base from the construction and operation of the wind turbines. No mitigative measures are deemed necessary.

6.2.6 Cultural Values

A vision statement contained in the Fillmore County Comprehensive Plan lists the following principles for use in guiding County level decisions:

1. A diverse and stable economy that provides economic opportunities for all Fillmore County citizens is the cornerstone for building our County.

2. Protecting our rural values, heritage, and natural resources.

3. Fillmore County is committed to supporting agriculture

4. Development is planned to occur in and around existing communities

5. Quality school systems, recreational and cultural opportunities, effective transportation systems, a variety of housing types, and a safe and healthy environment are essential to a healthy County.

Impacts

EcoEnergy believes that this transmission line project and the greater overall wind farm development promote these principles and the cultural values of Fillmore County. The entire wind project supports and diversifies the County's economy. It provides economic opportunity within the County without threatening rural values, heritage, or natural resources. The overall project effectively supports the rural economy by providing revenue to farm families. These same farm families have endorsed the project through their participation. Over $600,000 in annual County tax revenue will be generated by the overall project which may be used for County general fund purposes. Through these impacts, the overall project enhances opportunity for the citizen's of Fillmore County to protect and promote their cultural values in a manner consistent with their Comprehensive Plan.

Mitigative Measures

The proposed transmission line is consistent with the Fillmore County Comprehensive Plan and minimizes impacts to property. No specific mitigative measures are proposed or are necessary beyond the route selection considerations and construction practices identified in this document under other factors.

6.2.7 Recreation

A review of public recreational lands within the project area was completed by Natural Resources Consulting, Inc. out of Cottage Grove, Wisconsin, (NRC Consulting). Figure 5 presents a map of the natural features and recreational resources in the project area.

The proposed transmission line will cross a designated snowmobile trail at 120th Street. The Bluff Valley Trail is maintained as a DNR "Grant in Aid" trail by the Bluff Valley Riders Snowmobile Club of Fillmore County. As indicated in Figure 5, a short segment of the transmission line would parallel the trail. However, at this segment, the transmission line and trail are on different properties separated by an existing fenceline. Therefore, the transmission line and trail will be on opposite sides of the fence line with no direct conflict. As indicated in Figure 5, the transmission line turns a corner near the trail, a line pole will be located at this corner and away from the trail. The transmission line will span over the trail itself, without any direct conflict.

Impacts

There are no known recreational resources within the project area which will be impacted by the overhead transmission line or substation.

Mitigative Measures

No mitigative measures are anticipated since there are no recreational resources impacted within the project area.

6.2.8 Public Services

As part of the project planning process, EcoEnergy Wind will meet with local, state, and federal agencies in regard to potential impacts the project may have on local services. It is expected that impacts to public services and infrastructure will be mostly related to local and state agencies. Anticipated issues include:

- impacts to existing road right-of-way
- impacts to existing storm water culverts
- impacts to the operation of emergency vehicles during construction
- potential impacts to existing electric lines or other utilities
- other impacts as may be identified

The potential impacts to public services and infrastructure will be considered for both the construction phase and operational phase of the project.

Impacts

Construction Traffic (Physical): The construction phase of the project will impact both CSAH 44 and 120th Street. The primary impact will be construction related vehicles along and within the road right-of-way.

Construction Traffic (Logistical): The construction phase of the project could also impact the movement and dispatch of emergency vehicles, postal carriers, and school bus routes as large equipment and vehicles maneuver through the area. The transmission line will be constructed in conjunction with the wind farm such that construction traffic management will be part of the overall Traffic Control Plan for the wind farm.

Electric Lines and Other Utilities: The CSAH 44 and 120th Street rights-of-way include existing overhead electric lines and existing buried utility lines such as telephone and gas lines. During the design phase of the project, the exact location of these existing utilities will be determined so that the new poles will avoid any conflict. If the transmission line construction is in close proximity to any other utility, the construction will be closely coordinated with the owner of that utility.

Mitigative Measures

Construction Traffic (Physical): EcoEnergy has already met with the Fillmore County Engineer and the Harmony Township road authorities to initiate discussion of the project's impact on their roads. EcoEnergy will develop a formal Transportation Plan for the overall wind farm.

This Transportation Plan will be reviewed with County, Township, and State road officials and revised as necessary in response to any comments that are received that will address the transmission line and substation construction.

Construction Traffic (Logistical): EcoEnergy will coordinate closely with the owners and users of local roads to minimize the impact on the roadway network during the project's construction. Construction project managers will notify appropriate officials prior to the arrival of oversize loads and prior to expected road delays that may affect select routes. Upon completion of the construction, the project will not present any additional or unusual safety concerns related to traffic.

Stormwater and Drainage: During final design of the transmission line, local and regional storm water drainage ways and culverts will be

identified. These features will be reviewed and analyzed to ensure the transmission poles do not impact existing drainage ways or culverts.

Existing Utilities: The transmission line will be located in private easement for much of its length. Locating in private easement will avoid conflict with utilities located in the road right-of-way. Where conflict s are identified, close coordination with the owners of impacted utilities will ensure that there is little disruption of service for these utilities.

Traffic: The construction phase of the project will bring construction vehicles into the CSAH 44 and 120th Street right-of-way. Safety concerns attributable to construction traffic will be managed by a construction management staff on-site. All material deliveries and equipment movements will be made on designated routes. Appropriate local road authorities will be advised of traffic related issues in accordance with the project Transportation Plan as described in the *Public Services and Infrastructure* section. EcoEnergy will implement a plan to stress safety and caution with the drivers of these vehicles. These trucks will be sharing the local roads with the general public, and most importantly, with school buses and young drivers. Management staff will continuously reinforce the need for driver safety to the truck operators for the duration of the project construction. Upon completion of the construction, the project will not present any additional or unusual safety concerns related to traffic.

6.3 Land-Based Economics

6.3.1 Agriculture

This project is located in rural Fillmore County. The vast majority of the project area comprises agricultural land.

Impacts

The general topography of the proposed transmission line route and substation sites consists of flat farm lands, with gentle rolling hills. The route is proposed mainly along existing road right-of-way and will not include any grading work or disturbing of existing soils.

The poles for the transmission line located in private easement will be sited on agricultural production land. However, since the poles will be located close to the road right-of-way or property lines, they will have little impact on farming operations. During design of the line, owners of the land will be consulted to absolutely minimize the impact of pole placement on their farming operation.

The substation sites will require minor grading work to flatten the sites. The scale of these sites is from six to eight acres such that the grading

work will not significantly alter the local topography. The substation sites will remove small parcels of agricultural land out of production.

Mitigative Measures

The easement agreements provide just compensation to the landowners for the disruption associated with the construction phase of the project and the impact of poles on their property. Landowners will be consulted during project design to ensure minimal impact of pole placement on their properties.

The substation sites were acquired from the landowners. The sites were selected in part to minimize the loss of superior farm land.

6.3.2 Forestry

There are no logging operations in the Fillmore County area where the transmission line will be constructed. There are few trees in the area of the proposed transmission line, and no trees will be removed to construct the line or the substations.

6.3.3 Tourism

The route of the proposed transmission line and substation sites are not located near nor associated with any known tourist attractions or community resources.

Impacts

There are no expected impacts to local tourism or community resources.

Mitigative Measures

No mitigation is necessary. Community benefits related to the project are predominantly economic benefits from jobs and revenues paid to project landowners as discussed under the "Demographic Impact" section

6.3.4 Mining

There are no mining operations or identified mineral resources located along the proposed route or at the substation sites.

6.4 Archeological and Architectural Historic Resources

EcoEnergy Wind has engaged Pathfinder CRM of Spring Grove Minnesota, to prepare an archival report for the project area to include cultural and archaeological considerations.

Impacts

Pathfinder has performed a desktop survey of the known cultural and archaeological resources within the project boundaries. Pathfinder did not find the CSAH 44 and 120th Street corridors or the substation sites to contain any cultural or archaeological resources.

Mitigative Measures

Upon final design of the transmission line, Pathfinder will perform a Phase 1 Archaeological Review to ensure that the construction does not compromise any known or unknown cultural or archaeological resources.

If archaeological sites are found during the Phase I survey or during construction, their integrity and significance will be addressed in terms of the site's potential eligibility for designation on the National Register of Historic Places (NRHP). If such sites are found to be eligible for the NRHP, appropriate mitigative measures will need to be developed in consultation with Minnesota SHPO and the State Archaeologist.

6.5 Natural Environment

6.5.1 Air Quality

Temporary air quality impacts resulting from installation of the proposed transmission lines and construction of the substation would be limited to emissions from construction vehicles and fugitive dust from R-O-W clearing activities. These impacts would be minimal and temporary.

During operation of the transmission lines and substation, the only potential air emissions would be those occurring as a result of corona, i.e., the breakdown of air – producing ozone and oxides of nitrogen – when the electrical field intensity exceeds the breakdown strength of the air. This can occur at transmission line conductors where imperfections occur and/or under humid/wet climatic conditions. These emissions generally occur at rates that cannot be measured and ozone is relatively short-lived, since it combines readily with other compounds in the atmosphere.

Mitigation

Air quality impacts are anticipated to be non-substantive, therefore, no mitigation is proposed.

6.5.2 Water Quality

6.5.2.1 Ground Water Resources

The geology of Fillmore County is defined as gently rolling or upland rolling plain. The eastern half of the county contains a series of gently rolling divides which are remnants of an old geologic plain. The soil survey of Fillmore County identifies a relatively flat area covering the townships of Harmony and Bristol, where the transmission line and substations are proposed to be located.

Impacts

The construction and operation of the transmission line will not have any effect in the geologic or groundwater resources of the area.

Mitigative Measures

Since the proposed transmission line and substation will not impact any geologic or groundwater resources, no mitigation is required.

6.5.3 Surface Water, and Floodplain Resources

Most of the project boundary is located in a high plain area between the Root River and Upper Iowa River watersheds. The project area also includes a number of judicial ditches and drainage ways. A review of the Federal Emergency Management Agency (FEMA) floodplain maps for the project area found there are no documented floodplains within the project area. Figure 5 presents a map of the natural features and resources in the project area. Deer Creek is a small tributary stream that will be crossed by the transmission line. An existing electrical distribution line already crosses Deer Creek along 120th Street.

Impacts

The only potential impact that the transmission line could have on surface waters is regarding stormwater drainage in ditches and at culverts. Placement of poles could potentially impact stormwater flows.

The collection substation site will impact a small existing drainageway. The Switching Substation site will not impact local drainage.

Mitigative Measures

During design of the pole locations, careful consideration will be given to ditch drainage and culvert locations to avoid any conflict. No other mitigative measures regarding surface water is required.

Site design of the substation sites will address drainage issues and ensure that adequate drainage is maintained without impacting neighboring property.

6.5.4 Wetlands

Natural Resources Consulting of Cottage Grove, Wisconsin, has been engaged to identify the wetland, surface water, and floodplain resources that may be affected.

Initial wetland desktop studies and field inspection show that no wetland areas exist that are expected to be impacted by the project. A small stormwater ponding basin is located in the CSAH 44 right-of-way within the project, but will not be impacted by the project. A detailed review and assessment of potential wetlands will be completed for the entire corridor prior to commencing final design of the project.

Impacts

It is not expected that the proposed project will impact any wetlands. If wetlands are delineated, all efforts will be made to avoid impact. If impacts cannot be avoided, appropriate permits and mitigative measures will be coordinated through the Minnesota DNR and local Board of Water Resources.

Mitigative Measures

Since the proposed project is not expected to impact any wetlands, no mitigative measures are required at this time.

6.5.5 Flora and Fauna

6.5.5.1 Vegetation

The existing vegetation within the project area was assessed by review of aerial photographs, Light Data and Ranging information (LiDAR), and field inspections. This review process found the vast majority of the project area to consist of row crop agricultural land. There are also small areas of pasture lands and wooded parcels within the project boundaries. Most of the wooded parcels are around building sites or drainage ways.

Impacts

The transmission line poles will be located just outside the road right-of-way or just inside the road right-of-way. In either case, their location would have a negligible impact on existing vegetation since the disturbance area is very minor. A very limited number of trees may be removed if necessary to accommodate location of the line.

The Collector Substation and Switching Substation sites will replace row cropland with an aggregate surfaced area. The site for the Switching Substation also includes a small grove of trees, about 1 acre in area, to be removed. The landowner advises that the original oak trees in the grove have died off and been replaced with volunteer softwood trees and scrub brush.

Mitigative Measures

The construction and operation of the transmission line will have a very negligible impact on surrounding vegetation. Once poles are installed, the small disturbed area around the pole will be restored and re-vegetated. Tree removal will only be made where absolutely necessary for the line's construction.

The substation sites will be set at the minimum size needed to minimize the area of cropland taken out of production. The trees to be removed from the Switching Substation site have been offered to a local logging company. The logging company has advised that the trees have no commercial value beyond firewood. They said they would clear the trees and cut them up for sale as firewood to the extent practical.

6.5.5.2 Wildlife

The majority of the project area and surrounding landscape is used for agricultural purposes with crop land comprising a significant portion of the vegetative cover. Scattered patches of grassland, and forested hillsides make up the remaining wildlife habitat within the project boundary.

Avian and bat species are of particular interest in the vicinity of wind energy projects. Project specific pre-construction avian surveys are currently being conducted to identify the seasonal bird use within the project area. This survey effort will document the species composition and relative abundance of birds using or passing through the project area throughout the year. Also, a desktop avian and bat screening analysis will be conducted as part of the overall environmental analysis for the proposed project.

A number of mammal species have adapted to and thrive in agricultural landscapes that contain a mosaic of habitat types including crop land. The row crops provide seasonal cover and food for some species during the summer and fall months prior to harvesting, and waste grain remaining on the ground after harvest can provide migrating waterfowl and other wildlife with food leading into winter. The scattered forests, grasslands and wetlands provide the limited long-term cover and food. Species typical of this landscape include a variety of rodents such as squirrels,

rabbits and mice, white-tailed deer, red fox, coyote, raccoon, woodchuck and striped skunk.

Impacts

Regarding impacts to general wildlife, the transmission line infrastructure has a very small footprint on the landscape and will typically be located in existing agricultural fields thereby minimizing impacts to the most suitable wildlife habitat. The disturbance resulting from construction-related activities will be temporary and is expected to have minimal affects to the local wildlife.

Regarding impacts to birds and bats, an assessment of potential impacts to birds and bats can be determined for this project location. Similar studies that have been conducted in Minnesota and Iowa indicate that bird and bat fatalities related to transmission lines are minimal and do not significantly impact the overall population of these species.

Mitigative Measures

The location of the proposed wind energy facility was selected due to the favorable wind resource in this area and the open landscape that maximizes free flow of the wind. The proposed transmission line is located in this same area. As a result of this landscape and the agricultural land use practices, there is a lack of habitat that would typically attract large numbers of birds and bats. Based on these considerations, impacts to these species are expected to be minimal, and thus, pending study results that indicate otherwise, mitigative measures are expected to be unnecessary.

6.5.6 Soils

The Fillmore County Soil Survey manual was reviewed for general descriptions and summaries of the soils in the project area. The Soil Survey reports that the primary soil association for the project area is the Fayette – Dubuque - Whalan association. These soil groups are characterized by lightly colored soils formed chiefly over silty material. Within the project boundary, the Whalan type soil group is the most common. The soils in the project area have generally formed on top of a thin layer of glacial till that overlays the regional bedrock. These types of soils are typically found to be moderately well draining and susceptible to erosion.

Impacts

The construction and operation of this transmission line will not have any material impact on existing soils. The substation sites will be graded flat

and existing cropland will be replaced with an aggregate base surface for the final surface at the substations.

Mitigative Measures

Drilling the holes for the placement of the poles is the only soil impact of this project. Since this is such a minor impact, no mitigative measures are required.

The substation sites will require grading and will require erosion control in accordance with State and Federal rules.

6.6 Hazardous Materials

The process of constructing and operating an electric transmission line or substation does not introduce any special toxic or hazardous materials into the local environment. The materials and equipment required to construct and operate this facility are no different than used in conventional heavy highway or similar construction.

Impacts

During construction and operation of the line, vehicles involved in construction and maintenance will contain gasoline and other petroleum products. EcoEnergy Wind has not found any record of hazardous material disposal or dumping in this area and as such does not anticipate encountering any hazardous wastes along the line.

Mitigative Measures

The materials for the transmission line and substation are not anticipated to create a hazardous condition. If any wastes are generated or identified during this project, it will be addressed in conformance with local, State, and Federal requirements.

As part of the construction management requirements, a listing of the potential hazardous materials related to the construction or construction equipment will be filed in a construction field office. Material Safety Data Sheets will be maintained for any known hazardous material that any contractor or transportation company may bring to the site.

6.7 Rare and Unique Natural Resources

As part of the overall project review process, the Minnesota Department of Natural Resources performed a search of their Natural Heritage Database for the project area. This database contains information regarding known occurrences of rare and unique natural resources including wildlife and vegetation.

Impacts

The database search did not identify rare or unique plants or animals that would occur within the transmission line project boundary.

Mitigative Measures

Staff from EcoEnergy Wind, LLC and the project environmental consultant, Natural Resources Consulting, met with the Minnesota DNR to discuss the wind farm in October 2008. DNR staff included local regional staff from the Rochester office as well as a staff Ecologist from St. Paul. The Applicant will continue to work with the DNR to ensure that all rare and unique resources in the area are protected.

During the project planning phase, information gathered by the Natural Heritage Database inventory and DNR will be used to avoid locating the transmission line in the immediate vicinity of any critical or sensitive resources that might be identified. The Heritage Database information will also be used in the field, prior to construction, to ascertain whether or not any of the listed resources are present in areas designated for construction activities so that appropriate protective measures can be implemented prior to construction as needed.

7.0 FACTORS TO BE CONSIDERED BY THE COMMISSION

Minnesota Rules part 7849.5910 sets forth a number of factors that the Commission will consider when determining whether to issue a route permit for a proposed transmission line. There is information throughout this application that addresses each of these factors with respect to the EcoHarmony transmission line under review here. The purpose of this Section is to summarize the major features of this line under each of the factors the Commission will consider.

7.1 Effects On Human Settlement

The potential effects of the proposed transmission line on human settlement are discussed in Section 6.2. No residents or homes or businesses will be displaced. All applicable noise standards will be complied with. There will not be a need for additional public services. There are no recreational facilities or resources along the proposed route. The new line will not interfere with any goals under the Fillmore County Comprehensive Plan.

7.2 Effects On Public Health And Safety

No public health or safety effects are anticipated to result from the proposed transmission line. The line will have similar features as other 161 kV lines with respect to electric and magnetic fields, which are well below any levels of concern. Section 6.2.1 contains more information on this topic.

7.3 Effects On Land-Based Economies

As described in section 6.3, no adverse effects on the local economy are expected. There are no mining or forestry industries in the area. Tourism will not be adversely affected by the new line. The impacts of the transmission line on agricultural land will be minimal. The poles will follow existing right-of-way for much of the route, and the line will cross agricultural land for only about two miles, over private easement. Present farming practices can continue near the poles. The substation sites will require only a few acres.

7.4 Effects On Archaeological And Historic Resources

No archaeological or historic resources have been identified along the proposed transmission line route. Additional investigation will be conducted upon final design of the transmission line to ensure that

construction does not interfere with the integrity of these sites or resources.

7.5 Effects On The Natural Environment

Section 6.5 addresses the potential of the proposed line to impact air quality, water resources, flora and fauna, and soils. No material adverse impacts on any of these resources are anticipated from construction and operation of this transmission line. The line will have essentially no air quality impacts. There are no water bodies along the proposed line that will be impacted by the construction of the line. No wetlands or surface waters will be crossed by the line. The line will follow existing right-of-way for the most part, so little vegetation will be impacted by the placement of the structures. Soils will be disturbed to install the structures and substation sites will be graded but no long term impacts on nearby agricultural land are anticipated.

7.6 Effects On Rare And Unique Natural Resources

A search of the Minnesota Department of Natural Resources Natural Heritage database was conducted, and no rare or unique natural resources were identified along the proposed route.

7.7 Application Of Design Options To Maximize Efficiencies, Mitigate Impacts, And Accommodate Expansion

The Applicant has attempted to minimize the length of transmission that is required to deliver the energy from a large number of wind turbines to the grid and to keep the structures as unobtrusive as possible. The line is of sufficient voltage to handle the 280 MW capacity projected for the EcoHarmony West Wind project at full development. The structures are designed to be no taller than necessary and to be spaced to minimize the number of structures required. The site for the Collector Substation is located in the central part of the wind project as the most convenient location in order to collect the energy from all the turbines that will be installed as part of the overall project. The Switching Substation is located adjacent to an existing line to minimize the distance to the grid and to be available as needed in the future.

7.8 Use Of Existing Rights-Of-Way And Other Boundaries

The proposed transmission line will follow existing rights-of-way to the extent possible. The substation sites have been selected to border property lines to the extent possible. Easements for pole placement and overhang for blow-out purposes will result in minimal impacts to the property and will not affect existing or future uses of adjacent parcels.

7.9 Use Of Existing Generating Sites

Subpart I. of the rule seems intended primarily for the selection of sites for new generating facilities and is not applicable in this case where a proposed transmission line is being routed. However, the wind project that this transmission line will serve is a new location for wind turbines that will bring numerous benefits to the Fillmore County area.

7.10 Use Of Existing Transmission And Other Rights-Of-Way

Approximately ¾ of the route will be along existing road and electrical rights-of-way. Only a couple of miles of new right-of-way are required and most of this is already under easement with the owners.

7.11 Electrical System Reliability

This new transmission line will inject up to 280 MW of capacity into the transmission grid. The addition of this new line is being studied by the Midwest Independent Transmission System Operator (MISO). MISO will ensure that the line can be added to the system without jeopardizing reliability or deliverability.

7.12 Costs of Constructing, Operating, and Maintaining the Line

The new line is estimated to cost $6.1 million. The cost figures are presented in section 4.7. The Applicant has kept the line as short as reasonably possible and the voltage is no higher than necessary to handle the load. The costs are not out-of-line.

7.13 Unavoidable Impacts

It is unavoidable that some land will be taken out of agricultural use when a transmission line is constructed. However, the amount of land dedicated to the line and the substation sites is on the order of ten acres. Much of the line will be located along existing right-of-way.

Construction will result in short-term, temporary impacts, primarily related to soil disturbance and woody vegetation cutting. Construction of the proposed 161 kV transmission line can be scheduled to avoid conflicts with seasonal tillage, planting, and harvesting of agricultural crops wherever possible.

The visual impacts of the transmission line, substation, and switching station would be long-term. However, the transmission line would be located primarily along roadway/utility ROWs, and transmission and distribution lines will be co-located at some points. There are no

distinctive landscape features in the Project area that would require specific protection from visual impact.

7.14 Irreversible and Irretrievable Commitments of Resources

The transmission line, substation, and switching station are created from non-renewable materials, such as steel for poles, metals and other materials for transmission lines, conductors, and substations, as well as concrete and crushed rock, which, for the foreseeable future, would be irreversibly committed to the proposed Project. Fuel consumed during Project construction and maintenance also would be irreversibly and irretrievable committed to the proposed Project. Land occupied by the substation, switching station, and transmission poles would be irreversibly committed to use for the proposed Project for the foreseeable future. Although the materials and land used for the proposed Project could be "retrieved" in the future as recycled materials and by converting the land back to former uses, it is not likely to occur, since the transmission line would remain in service for the foreseeable future.

The commitment of these resources is countered by the benefit derived from the construction of a large wind conversion facility to help meet renewable energy mandates and construction of a transmission line that will improve reliability of service. These benefits would outweigh the irreversible and irretrievable commitment of resources.