May 13, 2010

VIA FEDERAL EXPRESS
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Re: In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota
MPUC Docket No.: ET-2/TL-08-1474
OAH Docket No.: 7-2500-20283-2

Dear Tony:

We write in follow up to our April 29, 2010 meeting that included the Minnesota Department of Commerce Office of Energy Security staff. During that meeting Great River Energy and Xcel Energy committed to providing information to you on possible transmission line design options for the Brookings County – Hampton 345 kV Project ("Project") at the Lower Minnesota River crossing locations in Le Sueur and Belle Plaine. We also offered to provide you with data we have regarding eagle collisions and transmission line facilities. This letter provides this information. In addition, this letter details our understanding of the requirements of the Bald and Golden Eagle Protection Act (the "Act") as it relates to the Project and our belief that no incidental take permit is required at this time because a bald eagle "take" is not likely to occur. Lastly, to assist the Minnesota Public Utilities Commission in making its decision, expected in July, we request that the United States Fish and Wildlife Service ("USFWS") advise us and the Office of Energy Security ("OES") staff by the end of the month whether the USFWS believes an incidental take permit is necessary prior to construction.

Project Background

We submitted a Certificate of Need application to the Commission in August 2007 for the Project and the other CapX2020 345 kV Projects, Hampton to La Crosse, Fargo to St. Cloud and St. Cloud to Monticello. By order dated May 22, 2009, the Commission granted the Certificate of Need for the Projects, finding that each project is needed to meet three independent needs, increase regional reliability, support generation outlet and enhance local

reliability. Order Granting Certificates of Need with Conditions, *In the Matter of the Application of Great River Energy, Northern States Power Company (d/b/a Xcel Energy) and Others for Certificates of Need for the CapX 345 kV Transmission Projects*, Docket No. ET-2, E-002, et al./CN-06-1115, May 22, 2009, as modified, August 10 , 2009 ("Certificate of Need Order"). The Certificate of Need Order further determined that the proposed 345 kV transmission line from Brookings County, South Dakota, to Hampton, Minnesota, must connect at a new Cedar Mountain Substation near Franklin and a new Helena Substation near New Prague. This necessary connection requires a crossing of the Lower Minnesota River.

To identify potential crossing locations, we gathered data from local, State and federal agencies, public meetings and from field visits within the 12-mile wide notice corridor developed for the Certificate of Need process. (A map of the notice corridor for the Lower Minnesota River crossing area is enclosed as **Attachment 1**). From that process, we identified 12 possible crossing locations. After meetings with USFWS staff, local representatives and stakeholders, the 12 crossings were narrowed to two crossings. The two crossings, referred to as Le Sueur and Belle Plaine, were determined to be the most appropriate because they use existing crossing locations (which was requested by both the public and regulatory agencies, including the USFWS). These two crossings also minimize impacts to human settlement and the environment. Following meetings with regulatory agencies and other stakeholders, we incorporated the two crossings into the preferred and alternate routes that we proposed in their Route Permit Application filed with the Commission in December 2008. The six letters of correspondence from the USFWS regarding possible configurations are attached as **Attachment 2**.

Lower Minnesota River Crossing Configuration Options

In evaluating Lower Minnesota River crossing locations and design options, we reviewed four structure designs: double circuit monoshaft, double circuit H-Frame, single circuit side by side H-Frame design, and double circuit horizontal three-pole.

For the double circuit monoshaft design, the conductors would have a vertical orientation. The pole heights would be approximately 170- to 180-feet tall and the right-of-way would be approximately 150 feet.

The double circuit H-Frame design would have similar right-of-way requirements, but structures heights could be reduced by approximately 30 to 40 feet.

The single circuit H-Frame structures placed side-by-side or the double circuit horizontal three-pole design would require additional tree clearing and additional poles at the river crossing, but would lower the height of the conductors and keep all conductors in a horizontal plane to reduce the aerial obstructions to avian species. These two designs would require an

approximately 220- to 285-foot wide right-of-way. However, the pole heights would be reduced to 75 to 85 feet.

Diagrams of these four designs are enclosed as **Attachment 3**. Photo simulations of the H-Frame and side-by-side H-Frame designs are enclosed as **Attachment 4**. A summary of the structure types and characteristics is shown in the table below. We note that spans will vary depending on final structure design and pole heights.

Structure Type	**Estimated ROW Width (Cleared Area)**[1]	**Structure Height**	**Horizontal Conductor Spacing**	**Vertical Conductor Spacing**	**Number of horizontal planes**[2]
Double Circuit Monoshaft	150	170-180'	18' conductor to pole	25'	4
Double Circuit Steel H-Frame	150	130-150'	29'	25'	3
Single Circuit Side By Side H-Frames	220-285	75 – 85'	29'	N/A	2
Double Circuit, Three-Pole Design	210-275	75 – 85'	29'	N/A	2

More information on river crossing designs that was included in the route proceeding record is contained in our February 8, 2010 letter to Judge Richard Luis and is attached as **Attachment 5**. We have also included a summary of the route proceeding record relating to the crossing alternatives as **Attachment 6.** We are continuing to evaluate design options for the Minnesota River crossings.

In developing route alternatives for the Brookings Project, we also evaluated possible undergrounding construction for double circuit 345 kV configuration and costs at two different

[1] This right-of-way excludes 60-foot right-of-way for the existing facilities at Belle Plaine.
[2] Includes shield wire.

locations with two different techniques. One construction technique is referred to as horizontal directional drilling ("HDD"); the second technique is referred to as trenching. We evaluated HDD at the Le Sueur river crossing and trenching at an area near County Highway 70 near Lakeville, MN. The reports for these analyses are enclosed as **Attachments 7 and 8.**[3] Pictures showing construction of an underground system are enclosed as **Attachment 11**.

At the Le Sueur crossing, transition facilities from the overhead lines to underground lines would be placed on the bluffs on each side of the river. This would result in approximately 2.5 miles of underground transmission. The circuit would be a straight line between these end points, which would pass under or near Bucks Lake. Black & Veatch, an engineering and construction consulting firm, estimated the cost to install the underground transmission at the Le Sueur crossing would be approximately $400 million. *See* Attachment 7.

An additional consideration relating to underground facilities is the duration of outages. While underground facilities have less frequent outages than overhead facilities, they take more time to repair. Because conductors located underground cannot be as easily inspected as overhead conductors, locating and repairing outages can be difficult and time consuming. Typical overhead transmission line outages are repaired and returned to operation within 24 hours. In contrast, repairs to underground facilities can take several weeks or more, particularly if the failed cable becomes frayed and wedged in the underground duct or casing. Such a cable would typically be abandoned and new cable would be threaded through an empty redundant duct made in the initial underground installation or a new duct or casing would need to be installed. It is unlikely that a redundant duct or casing would be installed across the Minnesota River at each of the crossings because of the associated costs. Therefore, if a failed line had to be abandoned, a new path would need to be directionally bored across the Minnesota River at considerable time and expense. During the extent of the repair, generation outlet capability of the system would be reduced and hundreds of megawatts of generation might not be able to be delivered to customers. The regional transmission system generally comprised of the 345 kV system and higher voltages would also be affected. Regional reliability is related to the efficient transfer and delivery of bulk power across regions and between regions while withstanding system contingencies, *e.g*. a line being out of service. The loss of the 345 kV segment at the Lower Minnesota River crossing would decrease the ability and flexibility of the regional transmission system.

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[3] Undergrounding analyses have also been conducted for the CapX2020 St. Cloud to Monticello and Hampton to La Crosse projects. These reports are attached as **Attachments 9** and **10**. Caution must be taken in comparing the undergrounding configurations and costs across the three projects, as each analysis was very specific to the needs, terrain, environmental impacts, technology utilized, and miles of underground circuit required. For example, the Hampton to La Crosse project analyzed a single circuit 345 kV configuration for the Mississippi River which would require an installation at a much greater depth than the Minnesota River.

Judge Luis' Recommendation

On April 22, 2010, Administrative Law Judge Richard Luis recommended that the Commission issue a Route Permit for overhead construction along an 240-mile route comprised of the Applicants' Modified Preferred Route with a two-mile modification near the Hampton Substation. ALJ Findings of Fact, Conclusions and Recommendation, *In the Matter of the Route Permit Application by Great River Energy and Xcel Energy for a 345 kV Transmission Line from Brookings County, South Dakota to Hampton, Minnesota*, Docket No. ET-2/TL-08-1474 (April 22, 2010). The overall Project cost for the recommended route is estimated to be $725 million (2007 dollars). A copy of Judge Luis's report can be found on the Commission's Edockets system, docket number 08-1474.[4]

In his report, Judge Luis recommended an aerial crossing of the Minnesota River at Le Sueur, citing costs as one of several factors: "Due to the significant environmental impacts, construction challenges and costs, undergrounding at Le Sueur or Belle Plaine is not a superior alternative to a traditional aerial crossing." *Id*. at finding 373. The $400 million cost is 80 times more than a similar capacity overhead circuit, which is estimated to cost $5 million for the same segment length. If underground construction were required at the Le Sueur crossing, the total Project cost would increase from $725 million to $1.12 billion, a 55 percent increase.

Bald and Golden Eagle Protection Act Requirements

The purpose of the Act is to control the taking, possession and transportation of bald eagles and golden eagles in the United States. 16 U.S.C. § 668. The USFWS's implementing regulations, 50 C.F.R. part 22, authorize the limited "take" of bald eagles and golden eagles under certain circumstances when the take is the unintended consequence of otherwise lawful activities. 50 C.F.R. § 22.11.

The USFWS has defined "take" to mean "pursue, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb".[5] The USFWS further defines "disturb" to include any activity that causes, or **is likely** to cause, to an eagle, injury, decrease in productivity, or abandonment of a nest.[6] Thus, only when there is a likelihood of disturbance is a permit required. *See e.g.* 50 C.F.R. §§ 22.26(c)(2), 22.26(e)(1) (stating that monitoring may be required where eagles **are likely** to be affected and in evaluation of a permit, the likelihood of take is considered); 50 C.F.R. § 22.26(g) (noting that USFWS may "deny issuance of a permit if we determine that take is not likely to occur").

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[4] The direct link is as follows: https://www.edockets.state.mn.us/EFiling/edockets/searchDocuments.do?method=viewDocument&documentId={7614403C-FDA7-429E-A39F-B9D763211A24}&documentTitle=20104-49478-01&userType=public.

[5] 50 C.F.R. § 22.3.

[6] 50 C.F.R. § 22.3 (emphasis added).

Bald and Golden Eagle Protection Act Requirements, as Applied to the Brookings Project

As noted in USFWS's analysis "Disturbance of Bald Eagles at Winter Roosting/Foraging Areas and Effects of Overhead Utility Line at River Crossings on Bald Eagles" and confirmed by our survey of the crossing locations, the Minnesota River Valley is an important eagle use area. The river valley provides varied and alternate sources for feeding and nesting. In fact, much of the river corridor exhibits the characteristics of an "important eagle use area" as defined in the Final Environmental Assessment.[7] It is our understanding the USFWS is evaluating whether an incidental take permit for bald eagles would be required for construction of the Project across the Lower Minnesota River. Given the design of the transmission facilities (tubular steel) and the fact that no nests were identified during the field survey within one mile of the route centerline, we do not believe a taking is likely to occur, and therefore an incidental take permit is not necessary.[8]

Eagle Interactions Associated With Distribution, Not Transmission Lines

Industry experience, confirmed by the studies cited in USFWS's analysis, is that electrocutions and collisions of bald eagles is most often associated with low-voltage distribution lines (less than 69 kV) and can largely be attributed to the spacing between the energized portion of the line and other conductive elements.[9] Distribution lines, if not properly designed, can provide insufficient separation between energized portions of the power line and a ground, leading to electrocutions. Additionally, bald eagle electrocutions are uncommon accounting to fewer than 5% of all avian electrocutions in several states.[10] Electrocution occurs when birds with large wingspans come in contact with either two conductors or a conductor and a grounding device. Our transmission line design standards provide adequate spacing to reduce the risk of raptor electrocution.[11]

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[7] USFWS. 2009. *Final Environmental Assessment Proposal to Permit Take as Provided Under the Bald and Golden Eagle Protection Act.* http://www.fws.gov/migratorybirds/CurrentBirdIssues/BaldEagle/FEA_EagleTakePermit_Final.pdf

[8] The USFWS has indicated previously that most, though not all, activities that conform with the National Bald Eagle Management Guidelines ("NBEMG") would not necessitate a permit. 74 Fed. Reg. 46836, 46854 (Sept. 11, 2009). Although not every project is as straightforward as maintaining a project separation distance from a bald eagle nest of 330 or 660 feet, based on the activity, our proposed construction activities would be at least a mile away from any bald eagle nest.

[9] Lehman, R.N., P.L. Kennedy, J.A. Savidge. 2007. *The state of the art in raptor electrocution research: A global review*. Biological Conservation (136), pp. 159-174.

[10] APLIC. 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

[11] The critical morphometric data for the bald eagle are as follows: wrist to wrist, 31-34 inches; wingspan, 66-96 inches and height, 18-28 inches.

Our experience is that bald eagle collisions are similarly rare and typically associated with distribution lines. Recent research by Bevanger,[12] Barrett and Weseloh,[13] Crowder and Rhodes[14] and Janss[15] confirms collisions are rare. These studies are enclosed as **Attachment 12**. These researchers identify "poor fliers" such as cormorants, gulls, and other large bodied birds with high wing loading (*i.e.* ratio of body weight to wing area) and low wing aspect (*i.e.* ratio of wing span to wing area) as more susceptible to collisions.

As we noted during our meeting with you on April 29, 2010, Xcel Energy maintains a database of avian interactions with power lines in their service territory. This database was created in 2002 and covers 18,000 miles of transmission line facilities and 79,000 miles of distribution line facilities owned by Xcel Energy Inc.'s four operating companies that provide service in Minnesota, North Dakota, South Dakota, Wisconsin, Michigan, Colorado, Texas and New Mexico. [16] The database is generally populated with data by maintenance crews during routine inspections of the facilities or when outages occur on the system.

Great River Energy, which serves members in Minnesota and Wisconsin, owns and operates 4,500 miles of transmission facilities. Great River Energy does not have an avian interaction database. However, we checked with the Manager, Transmission Construction and Maintenance, who is responsible for the maintenance of the Great River Energy transmission system and has worked in the transmission department for 25 years. He advised that he is unaware of any eagle interactions with Great River Energy's transmission facilities.

Similarly, since Xcel Energy created its database in 2002, none of the operating companies has had a confirmed bald eagle fatality caused by a transmission line. There have been only seven reported bald eagle fatalities, six of which were confirmed to have been caused by non-transmission facilities. A seventh fatality was reported near a 69 kV transmission line, a much smaller line than the facilities proposed for the Project. This

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[12] Bevanger, K. 1998. Biological and conservation aspects of bird mortality caused by electricity power lines: a review. Biological Conservation (86): pp 67-76.

[13] Barrett, G.C. and D.V. Weseloh. 2008. *Bird Mortality Near High Voltage Transmission Lines in Burlington and Hamilton, Ontario, Canada*. In Environmental Concerns in Rights-of-Way Management: Eighth International Symposium. J.W. Goodrich-Mahoney, L.P. Abrahamson, J.L. Ballard, and S.M. Tikalsky (eds).

[14] Crowder, M.R. and O.E. Rhodes, Jr. 2002. Relationships Between Wing Morphology and Behavioral Responses to Unmarked Power Transmission Lines. In Environmental Concerns in Rights-of-Way Management: Seventh International Symposium. J.W. Goodrich-Mahoney, D.F. Mutrie, and C.A. Guild (eds).

[15] Janns, G.F.E. Avian mortality from power lines: a morphologic approach of a species-specific mortality. Biological Conservation (95): pp. 353-359.

[16] The operating companies are in the following states: Southwest Public Service Company; Public Service Company Colorado (Colorado), Northern States Power Company, a Minnesota corporation (Minnesota, South Dakota, North Dakota), and Northern States Power Company, a Wisconsin corporation(Wisconsin and Michigan).

transmission line was adjacent to a railroad track and the cause of death is unknown. The specific incidents are as follows:

> 2 electrocutions from distribution equipment associated with fish hatchery and treatment lagoon in Colorado and Texas.
>
> 2 electrocutions from distribution structures in Colorado and Texas.
>
> 1 hit by vehicle at Colorado fish hatchery.
>
> 1 suspected electrocution in Wisconsin. Decayed Eagle carcass found below a 69 kV transmission line adjacent to railroad tracks by tree trimming service; cause of death unknown.
>
> 1 electrocution from distribution line in Minnesota. Eagle was carrying a mallard and made a phase to phase contact with the lines.

The incidence of bald eagle nests on transmission facilities is also limited. There is only one known active nest on a transmission structure, on an Xcel Energy lattice tower structure in Sherburne County .[17] It was a documented osprey nest that a bald eagle began to use. A picture of the nest and lattice structure is enclosed as **Attachment 13**. This lattice tower has double cross arms, which provides a surface on which to build nests. In contrast, the structures proposed for the Project will be round, tubular steel and we are unaware of any instance where a bird has been found nesting on structures with this design configuration.

No Bald Eagle Nest Found Within Mile of Either Route at Le Sueur and Belle Plaine Crossings

While the Minnesota River Valley is an important bald eagle area, our investigation shows that there are no bald eagle nests within one mile of either of the two Lower Minnesota River crossings. As recently as April 2010, we hired a biological expert to identify eagle's nests near the proposed river crossing at Le Sueur. We shared the findings of this evaluation with you at our meeting. The report is included as **Attachment 14.**

Bald Eagle Management Guidelines to Be Implemented with Other Mitigation Measures

To further minimize the risk of disturbance to bald eagles, we commit to follow the Bald Eagle Management guidelines (USFWS 2007) and will employ industry accepted best management practices to prevent birds from colliding with or being electrocuted by utility lines, towers and poles. These methods include installation of bird diverters on the shield wire at the

[17] No lattice structures are proposed as part of the Brookings Project.

river crossings.[18] We intend to conduct another bald eagle survey of the approved crossing prior to construction and will monitor for bald eagle activities throughout construction. This information will be provided to the OES and the USFWS and should there be any new data regarding eagle activities in the crossing area, we will work with USFWS to further evaluate the need for an incidental take permit.

We are also committed to working with the USFWS on proper timing of the construction at either crossing to further reduce the risk of impacts to bald eagles.

Conclusion

We believe that an incidental take permit is not indicated for the Project because we believe there is little likelihood that a bald eagle take will occur as a result of the Brookings Project transmission line aerially crossing the Minnesota River and that the mitigation methods we will employ will further reduce the risk of disturbance. A summary of our reasoning is as follows:

- Our investigation and biological survey found no eagle nest within one mile of either the Le Sueur or Belle Plaine crossing areas.
- Bald eagle interaction with electric facilities is typically with distribution facilities, not transmission facilities of the size and type proposed for the Project. Our experience is that bald eagles do not interact with 345 kV transmission line facilities.
- Construction will be timed to minimize avian impacts.
- A pre-construction survey of bald eagle activity will be completed and monitoring during construction will be undertaken.

[18] APLIC. 1994. *Mitigating bird collisions with power lines: The state of the art in 1994*. Edison Electric Institute, Washington, DC. 78 Chapter III, p. 20 (noting that shield wire is cited as the primary cause of bird collisions with power lines).

We request that the USFWS respond to this letter by the end of May and advise whether you concur with this conclusion. Please contact me should you need any additional information to complete your analysis.

/s/ Dan Lesher
Routing Lead, Brookings Project

/s/Kevin Lennon
Project Manager, Brookings Project

CC: Gerry Shimek, USFWS
Margaret Rheude, USFWS
Deb Pile, OES

Enclosures

Attachment 1: Certificate of Need notice corridor for Lower Minnesota River crossing areas
Attachment 2: USFWS letters
Attachment 3: Diagrams of pole designs
Attachment 4: Photo simulations of H-Frame side-by-side and H-Frame designs
Attachment 5: February 8, 2010 letter from Applicants to Judge Richard Luis
Attachment 6: Summary of Lower Minnesota River Crossing information from contested case proceeding
Attachment 7: Underground Analysis for Le Sueur Crossing, Brookings Project
Attachment 8: Underground Analysis for County Highway 70, Brookings Project
Attachment 9: Underground Analysis for Monticello—St. Cloud 345 kV Project
Attachment 10: Underground Analysis for Mississippi River crossing, Hampton – La Crosse 345 kV Project
Attachment 11: Pictures of underground construction
Attachment 12: Bevanger, Barrett and Weseloh, Crowder and Rhodes and Janss studies
Attachment 13: Bald eagle nest/lattice tower photograph
Attachment 14: Brookings County – Hampton 345 kV Transmission Line Project Migratory Bird Treaty Act/Eagle Nest Survey