AN OFFICIAL FILING
BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Joint Application of Dairyland Power Cooperative, Northern States Power Company-Wisconsin, and Wisconsin Public Power, Inc., for Authority to Construct and Place in Service 345 kV Electric Transmission Lines and Electric Substation Facilities for the CapX Twin Cities-Rochester-La Crosse Project, Located in Buffalo, Trempealeau, and La Crosse Counties, Wisconsin

Docket No: 05-CE-136

DIRECT TESTIMONY OF GRANT STEVENSON

INTRODUCTION

Q. Please state your name and business address.

A. My name is Grant Stevenson, and my business address is 414 Nicollet Mall, Minneapolis, Minnesota 55401.

Q. By whom are you employed and in what capacity?

A. I am employed by Xcel Energy Services Inc., ("Xcel Energy") the service company affiliate of Northern States Power Company, a Wisconsin corporation ("NSPW" or "Company"). My current job position is Senior Project Manager. As part of my responsibilities, I am the project manager for the Hampton to Rochester to La Crosse 345 kV Project ("Hampton – Rochester – La Crosse 345 kV Project" or "345 kV Project") and am primarily responsible for scope, cost, schedule, and risk management of the 345 kV Project.

Q. Please describe your educational background and professional experience.

A. I graduated from the University of Minnesota in 1986 with a Bachelor's degree in Mechanical Engineering. After graduation, I joined Northern States Power Company, a Minnesota corporation, as a Mechanical Engineer at the Sherburne County generating plant in Becker, Minnesota. I was responsible for managing projects to improve productivity, efficiency, and safety at the company's largest generating plant. I also managed contractors, plant operations, maintenance, and technical personnel. Since 1986, I have held positions with Xcel Energy with increasing responsibility.

I became a Transmission Project Manager in September 2000. In my role as Transmission Project Manager, I was a project manager for Xcel Energy's 825 megawatt ("MW") wind outlet transmission projects in southwestern Minnesota from 2003 until 2006. The project included more than 500 miles of transmission lines and affected 29 substations. In August 2006, I was promoted to Senior Transmission Project Manager and was assigned to the CapX2020 projects. This is the sixth transmission line proceeding I have participated in. My resume is attached as **Ex.-Applicants-Stevenson-1**.

Q. For whom are you testifying?

A. I am providing testimony on behalf of NSPW, Dairyland Power Cooperative ("Dairyland"), and WPPI Energy, (collectively "Applicants"). Applicants seek approval from the Public Service Commission of Wisconsin ("PSCW") and the Wisconsin Department of Natural Resources ("WDNR") to construct the Wisconsin portion of the 345 kV Project. The Wisconsin portion includes a 345 kV line from Alma, Wisconsin to

a new transmission substation near Holmen and associated 161 kV system interconnections at the new substation (the "La Crosse 345 kV Project" or "Project").

Q. What is the purpose of your testimony in this proceeding?

A. The purpose of my testimony is to provide information regarding the Project including engineering design, high level overview of construction methods, costs, and schedule. I am also available to support certain portions of the application for a Certificate of Public Convenience and Necessity ("CPCN") and WDNR Utility Permit ("CPCN Application").

Q. Were you involved in the preparation of Applicants' CPCN Application?

A. Yes. I contributed to the project management, engineering, and construction sections of the CPCN Application and was involved in routing analysis, development, and risk management. Additionally, I have participated in all aspects of Applicants' public outreach for the 345 kV Project including public open houses and agency meetings.

Q. What exhibits are attached to your testimony?

A.
- Ex.-Applicants-Stevenson-1: Resume of Grant Stevenson;
- Ex.-Applicants-Stevenson-2: Briggs Road Substation Conceptual Layout (PSC REF #:150056);
- Ex.-Applicants-Stevenson-3: Responses to PSCW Staff Data Requests 01-32 (correspondence with rail roads) and 01-33 (railroad AC electromagnetic study) (PSC REF #: 146639);
- Ex.-Applicants-Stevenson-4: AC Electromagnetic Study;
- Ex.-Applicants-Stevenson-5: Appendix J to the CPCN Application (Highway 35 Black River Floodplain Proposed Construction Plan) (PSC REF#: 150055);
- Ex.-Applicants-Stevenson-6: Q1 Rebuild Scenarios after CapX2020 Project Route Determination;
- Ex.-Applicants-Stevenson-7: Updated Environmental Impact Fee Tables;

Ex.-Applicants-Stevenson-8: Response to PSCW Staff Data Request 01-20 (Lower voltage costs assumed in EIF calculation) (PSC REF #: 146639); and

Ex.-Applicants-Stevenson-9: Response to PSCW Staff Data Request 03-02 (Lower voltage costs assumed in EIF calculation) (PSC REF #: 149401).

OVERVIEW OF PROJECT

Q. Can you provide a general overview of the Project as proposed to the PSCW?

A. The Project consists of the following:

- A new, 40- to 55-mile, 345 kV transmission line from the proposed Mississippi River crossing at Alma, Wisconsin to a Holmen area substation. The line would mostly follow existing 161 kV or 69 kV corridors. The new 345 kV line would, in most places, be constructed as a double circuit 345/161 kV line on single poles.
- A new substation near U.S. Highway 53 and Briggs Road near Holmen, Wisconsin ("Briggs Road Substation").

Details of the routes proposed and the reasons Applicants selected those routes are presented in the testimony of Mr. Tom Hillstrom.

STRUCTURE TYPES

Q. Generally speaking, what are the typical components of a 345 kV transmission system?

A. A 345 kV overhead transmission system is primarily comprised of transmission line components and substation facilities. Overhead transmission line components typically include: (1) an above ground structure, often referred to as a pole or tower; (2) the wires carrying the electricity, called conductors; (3) insulators that connect the conductors to the structures and provide structural support and electrical insulation; (4) ground rods located below ground and connected to each structure; and (5) grounded shield wires to

protect the line from direct lightening strikes. Transmission poles are generally made or either steel or wood. Overhead conductors are typically comprised of aluminum and steel strands.

Q. What structure types are Applicants proposing to use for the Project?

A. The Project would be constructed using weathering steel poles that oxidize to a dark brown color, except in areas where galvanized poles would be used as requested by the Wisconsin Department of Transportation ("WisDOT") to minimize visual impacts along the Great River Road/State Highway 35 ("GRR/STH 35"). For most of the Project, Applicants propose to install single shaft steel poles on concrete foundations. Where large angles (typically those greater than 30 degrees) are necessary, the Project may be designed using two-pole structures to reduce foundation diameters and aid constructability. Multipole structures could also be required in the hilly coulee region to provide additional strength for long spans between hilltops, to aid constructability, and to aid construction access in areas of special concern near the Trempealeau and Black rivers. The Project could require the use of 345/161 kV double circuit, 345 kV single circuit, 161 kV single circuit, 345/161/69 kV triple circuit, and 69 kV single circuit structures, depending on which route is selected.

Q. How tall are the structures that Applicants' propose?

A. Structure heights above ground would range from 75 to 195 feet, with the majority of poles being in the 130- to 170-foot range.

Q. Have Applicants made any revisions to the structure heights to reduce impacts in certain areas?

A. Yes. Applicants have reviewed concerns raised by agencies regarding the Black River floodplain and areas where the Project follows the GRR/STH 35. While structures for the Project will generally be 130 to 170 feet tall with a right-of-way of 150 feet, Applicants proposed alternate designs in the Black River floodplains and areas along the GRR/STH 35 in direct response to concerns raised by agencies:

- Sections 2A1, 2A2, 2A3 near GRR/STH 35: right-of-way reduced to 115 feet to preserve a screen of trees to reduce visual impacts. Pole heights are 130 to 155 feet.
- Sections 2A1, 2A2, 2A3, 2B, 2C, 2D, 2F near GRR/STH 35: Applicants worked closely with WisDOT staff to reduce visual impact through careful and modified pole placement and structure finish selection.
- Section 2I, crossing of Trempealeau River and GRR/STH 35: an alternate multipole type with heights of 90 to 110 feet is proposed to address WisDOT aesthetic concerns in this area. This horizontal design will also reduce bird impacts at the adjacent wetland area.
- Section 5B, Black River floodplains crossing, existing Dairyland's Alma-La Crosse 161 kV transmission line ("Q1 Line") alignment: pole heights of 75 feet are proposed. Existing Q1 Line pole heights are 60 to 70 feet tall. The design is a horizontal multipole configuration to reduce aesthetic and bird impacts.

- Section 8B, Black River floodplain crossing, Q1-Highway 35 Route: pole heights of 75 to 115 feet. The design is a horizontal multipole configuration to reduce aesthetic and bird impacts.

Q. What type of foundations do Applicants propose for the transmission structures?

A. The majority of poles are expected to be installed on steel reinforced concrete foundations. The foundations will generally be drilled pier concrete foundations that may vary 6 to 10 feet in diameter and 25 to 50 feet in depth. The particular dimensions of the foundations will depend on soil conditions. For the portion of the Q1-Highway 35 Route and Q1-Galesville Route in the Black River floodplain, vibratory caisson foundations are proposed. As an alternative, Applicants propose cap-on-pile foundation designs that would be required for some of the poles located in Segment 1, the Mississippi River crossing.

Q. What are the anticipated span lengths between structures for the Project?

A. Spans would typically be 600 to 1,100 feet between structures for the majority of the 345 kV line.

Q. The Minnesota Public Utilities Commission ordered that the Minnesota portion of the 345 kV Project use "double circuit capable" transmission structures for the Minnesota 345 kV transmission line. What does "double circuit capable" mean?

A. It means that the poles are designed to support two 345 kV circuits. A double circuit line can occupy the same width of right-of-way as a single circuit line. Therefore, constructing a double circuit capable line has the potential to reduce the overall number of transmission corridors. For the Minnesota portion of the 345 kV Project, certain segments will have two circuits built to 345 kV specifications with one circuit to be

operated at 345 kV and the other circuit operated at 161 kV. Other segments will have davit arms installed for both circuits, but only one circuit will be installed during initial construction.

Q. Are Applicants proposing to use double circuit capable transmission structures for the Wisconsin portion of the 345 kV Project?

A. Yes, but only for a 1.0- to 2.8-mile segment near the Mississippi River crossing. In this segment, the 345 kV line will be co-located with a 161 kV line, but the 161 kV side will be built to 345 kV specifications.

Q. Please describe the Applicants' proposal for a double circuit capable configuration near the Mississippi River crossing.

A. Applicants propose to use the double circuit capable configuration in the areas as follows, depending on the route selected:

- Q1-Highway 35 Route: Segments 1, 2A1, 2A2, 2A3 (2.8 miles).
- Q1-Galesville Route: Segments 1, 2A1, 2A2, 2A3 (2.8 miles).
- Arcadia Route: Segments 1, 2A1, 2A2 (1.6 miles).
- Arcadia-Alma Option: Segments 1, 2A1 (1.0 miles).

Segment 1 would be constructed to be capable of operating as 345/345/161 kV triple circuit structures but would be energized as 345/161/69 kV. Segments 2A1, 2A2, and 2A3 would be constructed as 345/345 kV and energized as 345/161 kV.

Q. Would constructing these segments as double circuit capable require additional right-of-way?

A. No. The same right-of-way would be required for either single circuit or double circuit capable segments.

Q. Are regulatory requirements necessary to change the operational voltage for the segments of the 345 kV Project where Applicants propose to use double circuit capable configuration?

A. Yes. Before increasing the operational voltage of the second 345 kV capable circuit, a CPCN from the PSCW would be required. For the Minnesota portion of the 345 kV Project, in order to increase the operational voltage of the second circuit, a Certificate of Need would be required from the Minnesota Public Utilities Commission. Therefore, Applicants could not change the operational voltage of these segments without additional regulatory approvals.

CONDUCTORS

Q. What type and size of conductor are proposed for the Project?

A. For the 345 kV circuit, Applicants propose to use two 954 kcmil 45/7 Cardinal ACSS or 954 ACSS/TW Cardinal 20/7 Type 13 conductors per phase. Applicants propose to use a single 795 kcmil 26/7 Drake ACSS conductor per phase for the 161 kV circuits to be rebuilt. For the 69 kV circuits to be rebuilt as part of this Project, Applicants propose to use a single 795 kcmil 26/7 Drake ACSS conductor per phase.

Q. What conductor support systems are proposed to be used?

A. Applicants propose three conductor support systems:

- Porcelain or glass V-string or I-string insulators for single circuit tangent poles.
- Porcelain or glass I-string insulators for angle poles.
- Double strings of porcelain or glass insulators for dead-end poles.

Q. Are Applicants proposing to install shield wires along the Project?

A. All proposed routes would use two shield wires. These shield wires would protect phase conductors from lightning strikes. Shield wires could consist of standard 7/18-inch, seven-strand extra high strength steel cable and/or a steel and aluminum stranded wire containing a fiber optic bundle core. The latter allows both lightning protection and a communication path between substations. Fiber optic installed would be used only for utility communication or to replace fiber currently installed on Dairyland's system.

BRIGGS ROAD SUBSTATION

Q. What substation facilities are proposed for the Project?

A. To integrate the proposed transmission line into the existing electrical system, a new Briggs Road Substation is proposed to be constructed near the intersection of U.S. Highway 53 and Briggs Road near Holmen. The Briggs Road Substation would be owned and operated by NSPW. No other substations are proposed to be constructed as part of the 345 kV Project in Wisconsin.

Q. What equipment is proposed to be installed in the Briggs Road Substation initially?

A. Applicants propose the following major equipment be installed for the Project:

- One 345/161 kV 448 MVA auto transformer with oil containment system.
- One 345 kV circuit breaker with associated control cables and foundations.
- One 34.5 kV 50 MVAR tertiary reactor with associated breaker, switch, foundations and protective relaying.
- A dead-end structure with foundations for the 345 kV line being terminated during the initial phase.

- Associated 345 kV aluminum bus, disconnect switches, switch stands and bus supports needed for the initial phase. Extra switches and stands will be installed to limit outages during future 345 kV additions. Drilled piers are planned for foundations for all support structures.
- Sixteen 161 kV circuit breakers with associated control cables and foundations.
- Four 161 kV, 80 MVAR capacitor banks would be installed with switches, foundations, and protective relaying.
- Dead-ends with foundations for the four 161 kV lines being terminated in the initial phase.
- 161 kV aluminum bus, disconnect switches, switch stands, and bus supports needed for the initial phase. Drilled pier foundations are anticipated for all support structures. The 161 kV bus is configured as a breaker-and-one-half design with seven bays installed for the Project. The substation would be laid out to accommodate five future 161 kV positions that could be installed if future conditions warrant.
- Protection and control panels for the 345 kV line, 161 kV lines, and 448 MVA transformer.
- An electrical equipment enclosure to house 345 kV and 161 kV protection and control equipment.
- Alternating current and direct current auxiliary systems.

Q. What is the approximate footprint of the Briggs Road Substation?

A. Conceptual design for the Briggs Road Substation estimates that a fenced area of approximately 700 feet by 700 feet. Additional area is needed for grading, driveways,

stormwater ponds, property line setbacks, etc. Figures 1 and 1A of **Ex.-Applicants-Stevenson-2**.

Q. What space requirements are required for the Briggs Road Substation?

A. Applicants believe that the ultimate layout of the Briggs Road Substation would require an additional three to four acres to be fenced with the dimensions of the fenced area being approximately 700 feet by 900 feet (totaling approximately 15 acres). The area to be graded would extend beyond the fenced area and the total graded area will depend upon the topography of the parcel selected. Property line setbacks, ponding areas, driveways, and sufficient space to route transmission lines into the substation require additional property. The minimum area required for the Briggs Road Substation is approximately 1,100 feet by 1,300 feet, or approximately 32 acres. Therefore, Applicants propose to acquire a parcel of approximately 40 acres.

Q. You mentioned the ultimate layout for the Briggs Road Substation would require three to four additional fenced acres. What do Applicants believe will be an ultimate layout for the Briggs Road Substation?

A. The ultimate design at the Briggs Road Substation would provide space for a future 161 kV connections, a future 345 kV connection, and a future 69 kV yard.

Q. Have Applicants identified when the expansion at the Briggs Road Substation would be required?

A. Applicants have not identified a specific date when expansion would be necessary.

Q. Have Applicants identified possible sites for the Briggs Road Substation?

A. Yes. Applicants have identified two potential substation sites, referred to as the "West Site" and the "East Site." The West Site is a relatively flat, irrigated farm field while the East Site is a rolling, partially-wooded site occupied by a horse rider/rodeo club.

Q. Have Applicants identified a preferred site for the Briggs Road Substation?

A. Applicants prefer the West Site.

Q. Why do Applicants prefer the West Site?

A. The East Site is currently used as an equestrian facility, which would need to be relocated. Additionally, the land is rolling and partially wooded. The physical condition of the East Site would require major grading and would incur a higher cost. Finally, archeological sites have been documented on the eastern area of the East Site. The West Site is currently used as agricultural land and would require minimal grading, thereby incurring a lower cost. Also, no occurrences of archaeological resources have been documented on the West Site.

Q. Why was the Briggs Road location selected for the substation?

A. The Project needs to connect to the existing 161 kV transmission network serving the La Crosse area. Two of the four main 161 kV lines serving the La Crosse area converge near the intersection of U.S. Highway 53 and Briggs Road. The existing Dairyland 69 kV substation is also located near this intersection.

CONSTRUCTION METHODS

Q. What sequencing of construction activities do Applicants anticipate will be used for the Project?

A. Applicants anticipate that construction will follow the sequence of surveying the centerline, performing a geotechnical investigation, determining construction access points and constraints, installing foundations, assembling and erecting poles, installing shield wires and conductors, installing bird flight diverters where necessary, installing ground rods, and cleanup and site reclamation.

Q. Describe the construction methods that Applicants will use when placing the transmission structures in the ground.

A. Within the right-of-way, once pre-construction steps are completed, foundations and poles will be installed. The majority of the poles are expected to be installed on steel reinforced cast-in-place concrete pier foundations. Concrete foundations are constructed first by excavating a hole with a large auger. After the hole is excavated, reinforcing steel and an anchor bolt cage are placed into the excavation, and the excavation is filled with concrete from a local batch plant. The completed foundation is allowed to cure to develop necessary strength. After the foundation is cured, the pole is mounted on the foundation using exposed anchor bolts. In general, poles would have drilled pier concrete foundations that may vary from 6 to 10 feet in diameter and 25-to 50-feet deep, depending on soil conditions.

Q. What is the next step in the construction process after foundations and poles are in place?

A. Conductors are then installed by establishing stringing setup areas within the right-of-way or on temporary construction areas outside of the right-of-way. Stringing setup areas are usually located every 8,000 to 10,000 feet along a route. The exact distance would depend on the type of conductor, access to the area, the terrain, and the route alignment. The stringing setup area would be approximately 100 feet by 200 feet in size. Conductor stringing operations also require brief access to each pole to secure the conductor wire to the insulator hardware and the shield wire to clamps once final sag is established. Where the transmission line crosses streets, roads, highways, or other energized conductors or obstructions, temporary guard or clearance poles may be installed. This ensures that conductors do not obstruct traffic or contact existing energized conductors or other cables during stringing operations, while also protecting the conductors from damage. Once stringing is complete, all stringing setup areas will be cleaned up and revegetated accordingly along with the right-of-way.

Q. What type of construction equipment will Applicants use?

A. Applicants expect to use construction equipment that is normally used in transmission line construction (e.g., tree removal equipment, mowers, cranes, backhoes, digger-derrick line trucks, track-mounted drill rigs, dump trucks, bucket trucks, bulldozers and related equipment). Poles would be transported on tractor-trailers in areas with conventional construction access, including matted access roads or ice roads, and via heavy lift helicopters in areas without ground-based construction access. Such areas could include the Black River floodplain if matted roads or ice roads prove to be impractical.

Q. How do Applicants propose to minimize impacts to land during construction of the Project?

A. To minimize impacts to land, Applicants would use general upland construction procedures utilizing standard construction equipment. Construction practices for the Project would conform to Best Management Practices ("BMPs") to minimize impacts to the environment. Additional BMPs have been developed to minimize impacts to agricultural lands used for construction of the Project including methods to minimize soil compaction, minimize soil mixing, and remove excavated materials.

Q. How will Applicants restore vegetation in areas where existing vegetation has been disturbed by construction?

A. The need for site restoration and revegetation will be determined after inspection of the degree of disturbance caused by construction activities. Revegetation and site restoration will also depend on the ecological setting of each site. In some instances, an agricultural property owner may only wish to have topsoil carefully replaced instead of having the location revegetated. Native seed banks may be used to facilitate revegetation in disturbed areas. Additionally, if areas are identified that have significant soil compaction or other disturbance from construction activities, reestablishment of the vegetation stratum may be required. A dormant cover will be used where winter construction occurs to allow for revegetation the following spring and those areas will be inspected in the spring to ensure proper cover has germinated.

Q. Will areas outside the right-of-way besides those for stringing or for access to the right-of-way be required for any construction activities for the Project?

A. Yes. Staging areas are usually established for projects of this type. Staging involves delivering the equipment and materials necessary to construct the new transmission line or substation facilities. A number of staging areas will likely be required to construct the Project.

Staging areas are selected for their location, access, security, and ability to efficiently and safely warehouse supplies. Areas are also chosen to minimize vegetation clearing, excavation, and grading. Any staging areas outside the transmission line right-of-way would be obtained through lease options from private landowners.

Q. Have Applicants identified locations for staging areas to be used during construction of the Project?

A. Yes. Applicants have secured lease options for eight identified staging areas. In addition, the Briggs Road Substation site can be used as a ninth staging area. These staging areas are located in the towns of Belvidere, Gross, Trempealeau, Onalaska, Galesville, Glencoe, and Arcadia. These staging areas range in size from 13 to 20 acres. Further information about each staging area location is available in Table 2.5-1 of the CPCN Application (**Ex.-Applicants-Hillstrom-1**).

Q. Will Applicants employ environmental monitors for the Project?

A. Yes. Applicants have included in cost estimates the use of environmental monitors for the Project. The environmental monitors would be responsible for the inspection and monitoring of construction activities to ensure compliance with environmental permit requirements and regulations. The monitors would work directly with Applicants' staff

and contractors, providing advice, consultation, and reports on environmental matters as they relate to construction activities. The environmental monitors would also communicate with agency staff as required. The monitors will be managed by Mr. Hillstrom.

Q. Applicants previously provided general construction information for railroad crossings through a response to a PSCW Staff Data Request. Are there any updates related to construction of the Project that can be provided at this time?

A. Yes. Responses were submitted to PSCW Staff Data Requests 01-32 and 01-33 on April 1, 2011, attached to my testimony as **Ex.-Applicants-Stevenson-3**, that identified the likely need for Applicants to obtain crossing permits from the Burlington Northern Santa Fe ("BNSF"). As part of its Utility Accommodation Policy, the BNSF may require a utility requesting permission to cross or parallel BNSF property to complete an inductive interference study. At the time the data request responses were provided, that study was only available in a preliminary version. The final version is attached to my testimony as **Ex.-Applicants-Stevenson-4**.

Q. Have Applicants applied for permission to cross the BNSF property identified in the previously-submitted data request responses?

A. Yes. After completing the inductive interference study, Applicants submitted an application for permission to cross BNSF property. On December 14, 2011, BNSF approved the applications. BNSF permits provide certain requirements for construction, clearances, and signage or marking that Applicants must follow during construction of the Project. Applicants will wait to execute the permits until the PSCW issues its CPCN decision.

Q. Applicants' response to PSCW Staff Data Request 01-32 states that permits will be applied for crossing property owned by Chicago and North Western Railroad and the Canadian National Railroad. Have Applicants submitted applications for crossing permits from these companies?

A. If one of the Q1 Routes is selected, standard crossing permits would be required from these railroads. Applicants will apply for any necessary permits after the PSCW issues its CPCN decision.

CONSTRUCTION THROUGH ENVIRONMENTALLY SENSITIVE AREAS

Q. Are other construction methods employed in areas that are determined to be environmentally sensitive or wetlands?

A. Yes. During construction, the most effective way to minimize impacts is to avoid wet areas, streams, and rivers. Construction equipment would not be allowed to cross waterways unless it is unavoidable, and then only after appropriate authorization is obtained from resource agencies. Where waterways must be crossed to pull in the new conductors and shield wires, workers may walk across wet areas, use boats, or drive equipment across ice in the winter or use helicopters. These construction practices help prevent soil erosion. Equipment fueling and lubrication would also occur at a distance from waterways. Permits from state or federal agencies for water crossings may also provide Applicants with additional guidance on construction techniques to minimize impacts, that would then be incorporated into construction plans and monitored by the environmental monitors.

Q. Have Applicants identified construction techniques for the Mississippi River crossing?

A. Yes. Applicants determined that crossing the Mississippi River may involve impacts such as temporary habitat disturbance associated with construction activities, modification of habitat associated with clearing for construction access, and temporary shoreline and river bottom disturbance associated with access from barges.

To minimize these identified impacts, Applicants will work closely with agencies, including the WDNR, the Minnesota Department of Natural Resources, the US Army Corps of Engineers and USFWS to develop additional construction plans for this area of the Project. To assist in developing additional techniques for the crossing, additional field surveys will be performed to identify specific habitats or other environmental concerns in this area prior to construction.

Q. Have Applicants identified design options and construction techniques to minimize impacts to the Black River floodplain if the Q1-Highway 35 Route or the Q1-Galesville Route is selected for the Project?

A. Yes. **Ex.-Applicants-Stevenson-5** outlines Applicants' proposed construction plan for the Black River floodplain. The proposed Q1-Highway 35 Route would require approximately 14 structures in a two mile crossing of the Black River floodplain. Specific design options and construction methods outlined in **Ex.-Applicants-Stevenson-5** eliminate the need for concrete, avoid the need for dewatering, do not generate spoils and will not require excavation in wetlands or placing gravel or other fill in wetlands for construction access.

Q. Can you describe the structure design options proposed by Applicants for the Black River floodplain to minimize construction impacts?

A. Applicants propose to use double circuit, horizontal steel structures, approximately 75 to 115 feet tall on the Q1-Highway 35 Route and 75 feet tall on the original Q1 Route. These poles will be supported by steel vibratory caisson foundations within the Black River floodplain area. Vibratory caisson foundations are hollow pole bases that are vibrated into the soil. Vibratory caissons do not require concrete, do not require dewatering, and do not generate spoils from excavations. In addition, the design of the line through the Black River floodplain utilizes shorter spans (maximum span between structures of approximately 700 feet with the exception of two spans of 1,200 feet and 970 feet on the Q1-Highway 35 Route) compared to the rest of the Project. The shorter spans, in addition to reducing structure heights, also reduce the loads to be supported by the structure resulting in structures that weigh less. Shorter and lighter structures reduce equipment (size and strength) requirements minimizing the size and load carrying requirements for the temporary access roads. Shorter and lighter structures also reduce the foundation strength requirements allowing for the use of smaller and lighter equipment for foundation installation.

Q. Describe the construction techniques that will be employed by the Applicants to minimize construction impacts to the Black River floodplain.

A. Construction access methods through the Black River floodplain will be planned to minimize ground disturbance and may include, but are not limited to: construction mats, winter access which includes mowing and snow removal to facilitate soil freezing, low ground pressure equipment, and restricting the length and width of the access route. In

certain environmentally sensitive areas, Applicants have offered to use helicopters for installation of poles, wire and accessories if required. NSPW, and our construction and engineering contractors have significant experience with these methods. Applicants will continue to work with the WDNR and USFWS to ensure that such areas are identified where these special construction methods should be used and where use is feasible.

Q. Do Applicants propose to implement any additional construction techniques to avoid impacts to sensitive resources, including threatened or endangered species along the Project?

A. Yes. In addition to the methods previously discussed that assist in minimizing or avoiding impacts to sensitive resources, Applicants will continue to work closely with the agencies to evaluate potential impacts to endangered and threatened species and to identify additional techniques that could be implemented to minimize or avoid impacts to these species. Additional techniques may include identifying areas were species exist and limiting construction to time periods that would be least disruptive to breading or growing seasons.

Q. What methods will be used during construction to prevent the spread of invasive species?

A. After a route is selected, Applicants would develop an invasive species plan to comply with Chapter NR 40 of the Wisconsin Administrative Code. That plan would provide information about invasive species present, and the extent of those species, within the project area. Additionally, the plan would provide BMPs, including identification of invasive species prior to allowing vehicles on the right-of-way, identification of

construction paths that would avoid infestation locations if possible, appropriate cleaning methods for vehicles and equipment, and proper disposal of infested excavated material.

CONSTRUCTION SCHEDULE

Q. What is the proposed construction schedule for the Project?

A. Depending on when the CPCN Order is received from the PSCW and other permits are received, construction on the Project would begin in 2013, with an in-service date of December 2015. The Project and construction activities are anticipated to be:

Activity	Quarter
Receive CPCN Order	2Q 2012
Finalize Substation and Line Design	2Q 2013
Right-of-Way Acquisition	2Q 2012 – 1Q 2014
Transmission Line Construction	2Q 2014 – 2Q 2015
Substation Construction	3Q 2013 – 4Q 2014
Final Right-of-Way Contacts and Clean-up	2Q 2015
In Service Date	December 2015

Actual dates are subject to modification based on permitting, availability of outages, etc.

PROJECT COSTS

Q. What is the total estimated cost of constructing the Wisconsin portion of the 345 kV Project?

A. The total cost of the Wisconsin portion of the 345 kV Project depends on which transmission line route alternatives are selected. As discussed in Mr. Hillstrom's direct testimony, eight different route combinations are included in this proceeding. At the time of submitting the CPCN Application (**Ex.-Applicants-Hillstrom-1**), Applicants estimated the Project (Wisconsin portion only) to cost in the range of $194.6 million for

the lowest cost option, Q1-Highway 35, to $224.4 million for the Arcadia-Ettrick Connector (Arcadia Route), the highest cost option. Table 2.1-18 of the CPCN Application provides detailed cost estimates. **Ex.-Applicants-Hillstrom-1**.

Q. Do the cost estimates provided include costs associated with obtaining permits for the Project from other agencies, acquiring rights-of-way or other land rights, and other costs associated with the construction of the Project?

A. Yes. The cost estimates provided are inclusive of all activities necessary to permit, construct, and certify the Project. The estimates include Applicants' understanding of the Project, recent labor and material costs, and market conditions. Cost escalation, or inflation, was accounted for using the industry accepted Handy-Whitman index. Applicants also considered the costs of other projects recently constructed by Applicants and affiliated companies in verifying cost estimates. Costs reviewed from other projects include those for environmental mitigation and monitoring and right-of-way acquisition, among other construction operations. If there are unexpected changes in material costs or labor or equipment rates, the Project cost may change. Additionally, unexpected or unusual weather conditions may impact the Project cost.

Q. In his testimony, Mr. Hillstrom describes an alignment adjustment and a new segment. Have you prepared estimates for this changes?

A. The estimates in the Application do not include the costs that would be incurred if the Q1-Highway 35 or Q1-Galesville adjustments were made to avoid any overlap with WisDOT rights-of-way along GRR/STH 35 ("Highway 35 Adjustment") or if the possible short realignment to the Q1-Highway 35 Route near the Town of Holland ("Holland U.S. 53 Adjustment"). Applicants estimate that if the Highway 35 Adjustment

were selected, costs would increase approximately $550,000 and if the Holland U.S. 53 Adjustment were selected, costs would increase approximately $1,300,000.

Q. In his testimony, Mr. Charles Thompson discusses Dairyland's planned rebuild of the Q1 Line and how the amount of co-location possible with the Project will affect the costs of the rebuild. Have you analyzed the Project costs in relation to this issue?

A. Yes. I have analyzed the costs that would be avoided for the Q1 Line rebuild based on route and provided cost information for the Rebuild Comparison of Alternatives Technical Memorandum attached to Mr. Thompson's testimony as **Ex-Applicants-Thompson-1**. Attached as **Ex.-Applicants-Stevenson-6**, is a presentation of this cost data.

Q. In the time since the CPCN Application was determined to be complete by the PSCW, have Applicants identified any cost estimates that need to be updated?

A. Yes. The environmental impact fee distributions have been revised and are attached to my testimony as **Ex.-Applicants-Stevenson-7**. This Exhibit is intended to replace the tables provided in Appendix H of the CPCN Application (PSC REF#: 150053). Additionally, **Ex.-Applicants-Stevenson-7** includes the estimated environmental impact fees for the following routes which were not included in the CPCN Application: Q1 Route (original alignment), Arcadia-Ettrick Route, Q1-Highway 35 Route with WI-88 Option A Connector, Q1-Highway 35 Route with WI-88 Option B Connector, Q1-Galesville Route with WI-88 Option A Connector, and Q1-Galesville Route with WI-88 Option B Connector.

Q. Why was the environmental impact fee distribution revised?

A. Environmental impact fee distributions have been updated to recognize areas that the Village of Holmen, Wisconsin, annexed into the village limits. Pre-annexation maps were used to calculate the distribution of the impact fees presented in the CPCN Application. This annexation changed the distribution of amounts for the environmental impact fee. Applicants reevaluated village limits and all environmental impact fee calculations and now provide the updated values. The overall total amount fee amount did not change. Instead, the distribution has been modified.

Q. Was any transmission or distribution infrastructure excluded from environmental impact fee cost estimates?

A. In the CPCN Application, Applicants calculated the environmental impact fee using the methodology provided by PSCW Staff in docket 137-CE-147 through a letter filed on September 16, 2010. **Ex.-Applicants-Stevenson-8** explains what facilities were excluded from the environmental impact fee calculations.

Additional detail regarding the rationale for excluding facilities below 345 kV from the environmental impact fee calculations is incorporated as **Ex.-Applicants-Stevenson-9**. The environmental impact fees were created to address concerns and impacts from the presence of the transmission lines. None of the current laws or rules provide the PSCW specific direction other than they need to determine the fee. Applicants believe the fees should only apply to the portion of transmission line facilities designed to 345 kV or higher and should not include any lower voltage facilities. This is, in part, because the environmental impact fee payments were created as part of the 2003 Act 89 as applied to high voltage transmission lines designed for operation at a nominal voltage of 345 kV.

(Wis. Stat. § 196.491(3)(gm)). The Wisconsin Administrative Code setting forth the environmental impact fee requirements (Wis. Admin. Code ADM § 46.03(5)) refers to the definition in Wis. Stat. § 16.969 (1)(b) which provides: "'High-voltage transmission line' means a high-voltage transmission line, as defined in § 196.491(1)(f), that is designed for operation at a nominal voltage of 345 kilovolts or more."

CONCLUSION

Q. Does this complete your direct testimony?

A. Yes, it does.

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