BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY TATANKA RIDGE WIND, LLC, FOR A PERMIT FOR A WIND ENERGY FACILITY IN DEUEL COUNTY, SOUTH DAKOTA, FOR TATANKA RIDGE WIND FARM

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PRE-FILED DIRECT TESTIMONY OF DANIEL FLO, AND BARR ENGINEERING CO., ON BEHALF OF TATANKA RIDGE WIND, LLC

June 17, 2019

TABLE OF CONTENTS

Q. Please state your name, employer and business address for the record.

A. Daniel Flo, Senior Environmental Consultant, Barr Engineering Co., 4300 MarketPointe Drive, Suite 200, Minneapolis, MN 55435.

Q. Briefly describe your educational background.

A. I received a Bachelor of Science degree in 1996 from Minnesota State University, Mankato, with a Major in Geography and a Minor in History. I then received a Juris Doctor degree from Lewis & Clark Law School in Portland, Oregon in 2002.

Q. Briefly describe your professional experience.

A. I have more than 15 years of experience in environmental permitting, environmental review, and regulatory compliance, largely related to large energy generation and transmission projects. I have managed or advised teams of consultants on state and local permitting, acoustical studies, wetland and waterbody surveys, habitat assessments, cultural resources surveys, and other related services for a dozen wind projects in the Dakotas and the Midwest. My educational and professional specialties are in environmental law and land use, environmental review and permitting, and project management.

Q. Have you attached a resume or CV.

A. Yes, my resume is attached.

Q. Have you previously submitted or prepared testimony in this proceeding in South Dakota?

A. No, I have not.

Q. What is the purpose of your direct testimony?

A. The purpose of my Direct Testimony is to provide information concerning existing environmental conditions in the area of the proposed Project ("Project Area"), potential impacts of the Tatanka Ridge Wind, LLC (Tatanka Ridge) Project on the existing environment, and how the Project will avoid, minimize, and/or mitigate potential impacts. In doing so, I am sponsoring several sections of the application, including:

Section 6.0 – Environmental Information

Section 7.2 – Soil Resources

Section 8 – Hydrology

Sections 11.1 – Land Use and Ownership

Section 11.2 – Recreation, Public Facilities, and Conservation Easements

Section 11.4 – Visual Resources

Section 13 – Water Quality

Section 14 – Air Quality

Section 16.5 – Cultural Resources

Section 22 – Additional Information

Q. Are you responsible for Section 6.1 of the application? What information is contained in that section?

A. Section 6.1 presents information on other energy conversion or transmission facilities and SDPUC-regulated projects in the Project area. There is one energy transmission facility

currently in operation, one under construction, and one energy conversion facility that will begin construction soon. The operational facility is a natural gas pipeline and associated compressor station that are regulated by the Federal Energy Regulatory Commission. In addition, a 345 kV electric transmission line is currently under construction just east of the Project area, and a 250 MW natural gas-fired power plant will be constructed near the Project and is expected to begin operation in 2021.

Although wind farms are not considered "energy conversion facilities" for the purposes of SDCL 49-41b-2(6), we also discuss that there is one wind project currently in operation 1.5 miles south of Tatanka Ridge, and another is proposed for construction northeast of Tatanka Ridge.

Specifically with regard to the cumulative effects of energy conversion facilities according to the state's definition, no negative impacts are anticipated, while cumulative beneficial impacts in the form of increased state and local tax revenue and local spending during construction are expected to occur.

Q. Please describe the farmland in the area?

A. Approximately 73.2 percent of the soils in the Project Area are classified as prime farmland and approximately 10.8 percent of soils are classified as not prime farmland (Table 7-2; Figure 14). Approximately 4.6 percent of the Project Area soils are classified as farmland of statewide importance. The remaining soils within the Project Area are considered prime farmland if drained (10.8 percent) or prime farmland if irrigated (0.6 percent).

Q. Are there expected impacts to soils?

A. Yes. Construction activities such as clearing, grading, trench excavation and backfilling, as well as the movement of construction equipment within the construction

workspace, may result in impacts to soil resources. Potential impacts on soil resources include soil erosion, soil compaction, reduction of soil fertility, and changes to other soil characteristics. Clearing removes protective cover and exposes soil to the effects of wind and precipitation, which may increase the potential for soil erosion and movement of sediments into sensitive environmental areas. Grading and equipment traffic may compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. Contamination from release of fuels, lubricants, and coolants from construction equipment could also impact soils. The majority of these impacts are temporary and related to construction activities, and can be minimized through the use of best management practices (BMPs). However, there will be permanent impacts associated with aboveground facilities.

Table 7-2 provides a summary of farmland types that will be affected by the Project. Land impacted by the installation of turbine foundations, the Project substation, operation and maintenance buildings and permanent access roads will be converted to impervious surfaces, thereby resulting in long-term operational impacts to soil resources at these locations. These permanent impacts represent only 1.9% of the prime farmland in the Project area.

Q. What impact avoidance and minimization measures will be used for soil resources?

A. Wind facilities are predominantly designed with turbines situated at higher elevations to minimize obstructions to wind. The current layout sites access roads away from steep slopes to the degree possible. The underground collector lines also avoid crossing steep ravines. Geotechnical soil borings will be conducted at wind turbine foundation locations prior to construction to determine the soil suitability to support turbine foundations. This information will help dictate final design parameters of the turbine and structure foundations.

During construction, the Project's construction contractor will use BMPs to stabilize

soils and prevent erosion and sedimentation, including the use of silt fence, straw mulch, erosion control blankets, and other materials that prevent the movement of water and soils off of slopes and into low-lying areas or other environmentally sensitive areas. The contractor will also use rock pads to minimize the tracking of soils off of the project site, and will follow the Project Spill Prevention, Control and Countermeasures (SPCC) Plan to prevent the contamination of soils from construction equipment.

Q. What permits are required for construction related to impacts on soils?

A. Construction of the Project will require coverage under the South Dakota Department of Environment and Natural Resources (SDDENR) General Permit for Storm Water Discharges Associated with Construction Activities. To maintain compliance with provisions of this General Permit, Tatanka Ridge will prepare a Stormwater Pollution Prevention Plan (SWPPP) to identify potential sources of stormwater pollution from the Project Area and specify BMPs to control erosion and sedimentation and minimize negative impacts caused by stormwater discharges from the Project. The SWPPP will be prepared prior to construction of the Project. The SWPPP will be implemented from the initiation of construction and will remain in effect until final stabilization is achieved. Once construction has been completed, Tatanka Ridge will backfill graded and excavated areas with the stored native material and return the construction area to pre-construction conditions. During Project operation, stormwater volume, stormwater flow and erosion and sediment impact to surface water and groundwater resources are not anticipated to change from pre-construction conditions.

Q. Do local ordinances for protection of soils apply to the Project?

A. Yes. Section 1215.03 1.f.vi of the Deuel County Zoning Ordinance requires that a Large Wind Energy System (LWES) develop a Soil Erosion and Sediment Control (SESC) Plan prior

to construction and submit the plan to the County Zoning Office. The Ordinance outlines several components required in the plan including but not limited to: plans for revegetation, grading, minimizing area of disturbance, maintaining downstream quality, and similar requirements. The Tatanka Ridge Project's SESC Plan was provided to Deuel County in April, 2019, as an attachment to the Project's Wind Energy System and Special Exception Permit applications and was accepted by the county upon the approval of the county permits on June 11, 2019.

Q. Has the Project considered impacts on groundwater resources?

A. Yes. Construction of the Project is not anticipated to have any long-term impacts on groundwater resources. Disturbances associated with Project construction of roads and collector lines are primarily limited to the upper 3 to 6 feet of the ground surface, with excavations for turbine foundations reaching up to 10 feet in depth. Most of the aquifers in the Project Area are at least 50 feet below the ground surface, and are typically encountered at 100 feet below ground surface. Construction activities such as trenching and backfilling and dewatering that encounter shallow groundwater may result in negligible to minor short-term and very localized fluctuations in groundwater levels depending on the proximity and connectivity of groundwater and extent of the excavated area. Once the construction activity has been completed, the groundwater levels typically recover quickly.

Q. What about potential impacts to surface waters and wetlands?

A. Tatanka Ridge has conducted wetland and waterbody delineations within the Project Area according to the USACE Wetlands Delineation Manual, Great Plains Regional Supplement (Environmental Laboratory 1987), and is continuing these field surveys this summer (2019). The results of the wetland and waterbody delineations will be used to refine Project design elements in order to avoid and minimize potential impacts. All field surveys and survey reports are

expected to be complete by September of 2019.

Temporary and long-term operational impacts to surface waters and wetlands are discussed in Section 8.2.2. Construction activities in the vicinity of these waterbodies and wetlands have the potential to temporarily increase sedimentation due to erosion and from changes in runoff patterns and water volumes due to increased impervious surfaces.

Q. How will impacts to surface waters and wetlands be avoided or minimized as a result of Project design and later during Project construction?

A. Turbines and the meteorological tower will be constructed on higher elevations within the Project area to maximize the wind resource and are not located within wetlands or waterbodies. Access roads, collector systems, the O&M facility, the collection substation and interconnection switching station were designed to avoid or minimize impacts to wetland and waterway features whenever feasible. Temporary impacts associated with crane paths will also be minimized. In the Big Sioux watershed, Tatanka Ridge will install collector lines across waterbodies using trenchless techniques to avoid in-stream impacts. Where crossings of streams and drainageways cannot be avoided by access roads, appropriately designed crossings (i.e., culverts, low-water crossings) will be constructed to maintain existing drainage. In the Big Sioux watershed, such stream crossings will also be designed to maintain fish passage. If construction in or through wetlands must occur, the use of timber mats is a BMP to minimize the temporary impacts to those wetlands.

Tatanka Ridge will avoid impacts to the extent practicable through the use of BMPs during construction. Impacts that do occur are anticipated to be short term and localized. As described in Section 8.2.3, for surface water and wetlands, BMPs will be designed and implemented to control sedimentation and erosion during the construction phase of the Project.

The BMPs may include silt fence, erosion control blankets, temporary stormwater sedimentation ponds, revegetation and/or other features and methods designed to control stormwater runoff and mitigate erosion and sedimentation. The BMPs will be implemented to reduce the potential for impacts to drainage ways and streams by sediment runoff. Because erosion and sediment control will be in place for construction, operation, and decommissioning of the Project, impacts to water quality are not expected to be significant.

The potential for fuel spills during construction and operation will be minimized by adhering to the procedures outlined in the Project's SPCC Plan. Such spill avoidance and impact minimization measures include the use of secondary containment for any on-site fuel storage; regular inspection of secondary containment, tanks, and hoses; and ensuring that any refueling activities that occur away from permanent facilities do not happen within a specified distance of wetlands and waterbodies, and only on impervious surfaces unless secondary containment is used.

Because no significant or long-term impacts to surface waters and wetlands are expected, no formal mitigation of these resources will be required.

Q. Please discuss land uses in the project area.

A. The following land use classifications occur within the Project Area: agricultural, including cultivated croplands (70.8%) and pastures and hay (2.8%); developed lands (4.1%); and natural areas (22.3%). Natural areas include grasslands, open water, wetlands, and wooded wind breaks. See also Direct Testimony of Janelle Rieland for a discussion of Native Undisturbed and Non-Native Undisturbed Grasslands. Occupied farm sites and rural residences are scattered throughout the Project Area. There are 129 occupied and presumed occupied residences within one mile of and including the Project Area, but not including the town of

Toronto, which is entirely within a one-mile buffer of the Project boundary.

Q. What steps will the Applicant take to avoid or minimize impacts to existing land uses?

A. Project construction will result in conversion of only a small portion of the land within the Project Areas from existing land uses to the proposed Project uses. Following completion of construction, the construction contractor will coordinate with landowners and the NRCS regarding the appropriate seed mixes to use for revegetation of temporarily impacted areas, or in the case of cultivated lands, no seed mix use at all. Seed mixes, revegetation, and similar activities related to the SWPPP are discussed in sections 7.2 and 8.2.

Q. Describe the Project area with regard to recreation, public facilities, and conservation easements?

A. The Project area does not include any designated recreation areas. It does include public facilities in the form of one SDDOT maintenance facility and the Toronto cemetery. There are also five USFWS conservation easements within the project area, including one grassland easement and four wetland easements.

Q. How will the Project avoid impacts to public facilities and conservation easements?

A. Tatanka Ridge carefully selected the proposed wind turbine, crane path, collector line, and access road locations to avoid or minimize direct impacts to protected wetlands and grasslands. The proposed wind turbine locations are all within upland areas and not located within wetlands. The USFWS easements do not allow impacts to protected grasslands or wetlands without specific coordination and permission. Tatanka Ridge is coordinating with the USFWS to cross one of these USFWS wetland easements with a collector line (See Figure 3). The Project will avoid impacts to the wetlands within the easement by either spanning the

wetlands with overhead collector lines, or by boring beneath the wetlands. Tatanka Ridge will notify the USFWS of its proposed avoidance method when the design has been finalized.

The two public facilities will be avoided by all project construction and operations.

Q. Please discuss the visual impacts of the Project.

A. Tatanka Ridge has collocated linear Project features such as access roads and collector and communication systems with existing disturbances where possible. This is consistent with the South Dakota Bat Working Group's and South Dakota Department of Game, Fish and Parks (SDGFP's, Undated) Siting Guidelines for Wind Power Projects in South Dakota for reducing impacts to visual resources. Similarly, operation of the Project will not introduce new visual components into the Project vicinity. The Project vicinity already includes wind turbines from the Buffalo Ridge II Wind Project, as well as existing electrical transmission lines.

The magnitude of visual impacts associated with the Project will depend on several factors, including:

Distance of the proposed Project Facilities from viewers;

Duration of views (highway travelers vs. permanent residents);

Weather and lighting conditions;

The presence and arrangements of lights on the turbines and other structures; and

Viewer attitudes toward renewable energy and wind power.

To minimize visual impacts of the Project, Tatanka Ridge has incorporated setback requirements and commitments into the design of the Project (Table 12-1). In accordance with Federal Aviation Administration (FAA) regulations, the towers will be painted to reduce potential glare and minimize visual impact.

In addition, Tatanka Ridge is electing to use an Aircraft Detection Lighting System

(ADLS) for the Project as an alternative to traditional obstruction lighting for turbines that flash continuously on a set interval. ADLS is a sensor-based system designed to detect aircraft as they approach the Project area. The system will automatically activate the warning lights on each turbine until the aircraft leaves the area. ADLS does not require additional equipment in an aircraft. Tatanka Ridge is currently searching for an FAA-approved ADLS vendor, after which it will determine the planned locations of the associated radar installations.

Q. Is the Project anticipated to impact existing water quality?

A. As discussed in the sections discussing surface water and groundwater, above, the Project is not anticipated to have significant or long-term impacts to water quality.

On June 3rd, 2019, Jesse Bermel received a letter from Shannon Minerich at the South Dakota Department of Environment and Natural Resources, Surface Water Quality Program, in response to a request for comments on the proposed Project. The letter outlines four water quality-related issues for the Project to be aware of prior to and during construction. Tatanka Ridge has addressed how these potential impacts will be avoided or minimized throughout the application and in other sections of this testimony, and that of other application sponsors.

Q. What impacts from construction are anticipated to air quality in the area?

A. As found in Section 14, temporary construction impacts include fugitive dust emissions and short-term emissions from diesel trucks and construction equipment. Temporary impacts will occur if a concrete batch plant is used during construction. Any air quality effects resulting from construction will be short term and limited to the time of construction activities and will not result in North American Ambient Air Quality Standards (NAAQS) exceedances for particulate matter or significantly contribute to greenhouse gas emissions.

The Project received an Air Quality Determination from the South Dakota Department of

Environment and Natural Resources dated May 7, 2019, stating that "the project will have little or no impact on the air quality in this area. This project is approved."

Q. What are "cultural resources?"

A. Cultural resources refer to the remnants of past human activity on the landscape, including historical architecture, pre- and post-contact Native American artifacts, dwelling sites, and other material remains.

Q. With respect to cultural resources, what steps has Tatanka Ridge taken to identify cultural resources within the Project site?

A. Tatanka Ridge hired an archaeological services consulting firm, HDR Engineering (HDR), to conduct research to identify known historic sites and other cultural resources within and near the Project area. Project designs considered the locations of these known sites, whether they had been evaluated for their eligibility for listing on the National Register of Historic Places (NRHP) or not, and avoided those sites.

In addition, HDR is conducting a Level III archaeological survey of all portions of the survey corridor. This survey is ongoing and the results will be reported to the PUC and the South Dakota State Historical Society once those efforts are complete.

Tatanka Ridge will avoid all archaeological resources potentially eligible for listing in the NRHP, sites deemed culturally sensitive, or sites that have not been evaluated for eligibility that are identified in further evaluations. As is stated in Section 16.5.1, there are five previously identified sites that intersect the Project survey corridor. All five sites were either not found during surveys, or will be avoided during Project construction. All five sites remain unevaluated for listing on the NRHP.

Q. In addition to Energy Facility Permits, what other permits are required for the

Project?

A. Various federal, state, and local approvals will be required for the Project. Table (22-1) in the Application identifies potential permits or approvals that may be required for the construction and operation of the Project, and also identifies the status of each permit or approval.

Q. Please discuss the Applicant's agency coordination efforts.

A. As discussed in Section 22.2 of the Application, as part of Project development and the permitting process, the Applicant has coordinated with various federal, state, and local agencies regarding the Project. Numerous meetings and discussions have been held with USFWS and South Dakota Game, Fish and Parks regarding avoidance and minimization of potential impacts to wildlife and associated habitat. Agency coordination will continue throughout the permitting process and, as needed, during Project construction and operation.

(end of DSF testimony)

Dated this 17th day of June, 2019.

/s/

Daniel Flo, for TATANKA RIDGE WIND, LLC