Fredrikson & BYRON, P.A.

November 13, 2018

VIA ELECTRONIC FILING

Ms. Patricia Van Gerpen
Executive Secretary
South Dakota Public Utilities Commission
500 E. Capitol Avenue
Pierre, SD 57501-5070

RE: In the Matter of the Application by Prevailing Wind Park, LLC for a Permit of a Wind Energy Facility in Bon Homme County, Charles Mix County and Hutchinson County, South Dakota, for the Prevailing Wind Park Project Docket EL18-026

Dear Ms. Van Gerpen:

In connection with the above-referenced matter, enclosed please find the following documents:

- Prevailing Wind Park, LLC's Proposed Findings of Fact, Conclusions of Law and Order;
- Prevailing Wind Park, LLC's Post-Hearing Brief, and Attachments A-C; and
- Certificate of Service.

If you have any questions, please contact me.

Sincerely,

/s/ Lisa Agrimonti

Lisa Agrimonti
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Enclosures

cc: Certificate of Service/Service List

65216913

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC FOR A PERMIT FOR A WIND ENERGY FACILITY IN BON HOMME, CHARLES MIX, AND HUTCHINSON COUNTIES, SOUTH DAKOTA, FOR PREVAILING WIND PARK ENERGY FACILITY	* * * * * * * *	**PREVAILING WIND PARK, LLC'S POST-HEARING BRIEF** **EL18-026**

INTRODUCTION

Prevailing Wind Park, LLC ("Prevailing Wind Park" or "Applicant") submits this post-hearing brief to the South Dakota Public Utilities Commission ("Commission") in support of its Application for Energy Facility Permit for the proposed Prevailing Wind Park Project ("Project"). As discussed in more detail below, the primary material issue in dispute after the evidentiary hearing is what sound limit the Commission should apply to the Project. The record supports applying the same sound limit of 45 A-weighted decibels ("dBA") on non-participating residences in Bon Homme County and Hutchinson County that the Commission has uniformly applied in the Dakota Range (EL18-046) and Crocker (EL17-055) dockets. Based solely on Prevailing Wind Park's commitment, a 43 dBA limit at non-participating residences is appropriate in Charles Mix County.[1] The record lacks any reasonable justification under the siting criteria for varying from these levels.

Taken as a whole, the record evidence demonstrates that the Commission should grant the requested permit for the Project, subject to the attached Attachment A, Applicant's and

[1] Prevailing Wind Park committed to a 45 dBA limit at participating residences in Charles Mix County unless there is a signed waiver is obtained from the owner of the residence. Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski).

Staff's Revised Joint Recommended Conditions, and Attachment B, Applicant's Proposed Sound and Charles Mix Conditions.[2]

BACKGROUND

I. THE PROJECT.

The Project is an up to 219.6 megawatt ("MW") wind energy conversion facility located in Hutchinson, Bon Homme, and Charles Mix counties, which is proposed to include up to 61 wind turbines. The Project would interconnect at Western Area Power Administration's ("WAPA") existing Utica Junction Substation; WAPA is preparing an Environmental Assessment ("EA") in connection with its review of the Project's proposed interconnection.[3] The EA will tier off of the Upper Great Plains Wind Energy Programmatic Environmental Impact Statement ("PEIS") and will analyze the potential environmental effects of the Project and the proposed transmission line that is being permitted locally (rather than solely the proposed interconnection).[4] The Project area ("Project Area") is comprised of 50,364 acres of land between the towns of Avon, Tripp, and Wagner.[5]

Prevailing Wind Park proposes to use the GE 3.8-137 turbine model for the Project, which is a 3.8 MW turbine with a 111.5 meter/366-foot hub height and 137-meter/450-foot rotor diameter.[6] The total turbine height is 586 feet.[7] In addition, Prevailing Wind Park seeks the flexibility to use the GE 2.3 MW turbine model at up to nine locations in the event that the use of

[2] The Revised Project Layout admitted as Attachment 4-2 to Exhibit I-29 is attached to Applicant's brief as Attachment C.

[3] Ex. A1 at 1-1, 3-1 (Application).

[4] Evid. Hrg. Tr. at 455-56 (Canty).

[5] Ex. A1 at 1-1 (Application).

[6] Ex. A7 at 2 (Pawlowski Rebuttal).

[7] Ex. A7 at 2 (Pawlowski Rebuttal).

the GE 2.3 MW turbine model is required to qualify for the production tax credit ("PTC").[8] The GE 2.3 MW turbine has an 80-meter/260-foot hub height and 116-meter/380-foot rotor diameter with a total tip height of 453 feet.[9]

The evidence demonstrates that Prevailing Wind Park has worked cooperatively with local governments, even where no local land use controls exist. Specifically: Bon Homme County granted a Large Wind Energy System approval for the Project on August 21, 2018; Hutchinson County granted conditional use approvals for the Project on September 4, 2018; and, the Project received building permits from Charles Mix County in July 2018 and worked with Charles Mix County, which does not have a zoning ordinance, to address concerns regarding the Project.[10]

II. PROJECT DEVELOPMENT & OWNERSHIP.

Prevailing Wind Park will own, manage, and operate the Project. Prevailing Wind Park is a wholly-owned subsidiary of sPower Development Company, LLC ("sPower"), which is an independent renewable energy company with extensive experience developing and operating renewable energy assets across the United States.[11]

Prevailing Wind Park acquired the Project in 2017 from Prevailing Winds, LLC, which was formed by a group of local investors who sought to create additional sources of income for area landowners and economic growth for the local communities through wind energy.[12] Since its October 2017 acquisition of the assets and development rights to the Project, Prevailing Wind Park has undertaken extensive development activities, consisting of landowner outreach and

[8] Evid. Hrg. Tr. at 209 (Pawlowski).

[9] Evid. Hrg. Tr. at 209 (Pawlowski).

[10] Ex. A7 at 1 (Pawlowski Rebuttal).

[11] Ex. A1 at 1-1 (Application).

[12] Ex. A1 at 2-1 (Application); *see also* Ex. A1 at § 9.1 (Application).

easement acquisition, detailed studies of resources in the Project Area, coordination with resource agencies, and design and refinement of the Project configuration.[13] For example, since acquiring the Project, Prevailing Wind Park negotiated additional lease agreements for approximately 40 percent of the total Project acreage.[14] Prevailing Wind Park has obtained all of the private land rights necessary to construct the Project.[15]

LEGAL STANDARD

Pursuant to South Dakota Codified Law ("SDCL") 49-41B-22, Prevailing Wind Park has the burden of proof to establish:

> (1) The proposed facility will comply with all applicable laws and rules;
>
> (2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;
>
> (3) The facility will not substantially impair the health, safety or welfare of the inhabitants; and
>
> (4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

The Commission must make complete findings regarding an energy facility permit application and must grant, deny, or grant with conditions or modifications an energy facility permit.[16] The Commission must find that the Project meets the requirements of SDCL Ch. 49-41B.[17]

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[13] Ex. A1 at 2-1 (Application).

[14] Evid. Hrg. Tr. at 215, 226 (Pawlowski).

[15] Ex. A1 at 2-1 (Application).

[16] SDCL § 49-41B-25.

[17] *Id.*

DISCUSSION

I. THE PROJECT WILL COMPLY WITH ALL APPLICABLE LAWS AND RULES.

The evidence submitted by Prevailing Wind Park demonstrates that the Project will comply with all applicable laws and rules.[18] No other party submitted evidence to the contrary. Thus, Prevailing Wind Park has met its burden of proof with respect to this factor.

II. THE PROJECT DOES NOT POSE A THREAT OF SERIOUS INJURY TO THE ENVIRONMENT OR SOCIAL AND ECONOMIC CONDITION IN THE PROJECT AREA.

The evidence demonstrates that the Project does not pose a threat of serious injury to the environment or social and economic condition in the site proposed for the Project ("Project Area"), and that Prevailing Wind Park has adopted numerous avoidance and minimization measures, as well as commitments, to further limit potential environmental impacts. More specifically, Prevailing Wind Park has demonstrated that it will avoid and/or minimize impacts to:

- Geological resources;[19]
- Soil resources;[20]
- Hydrology;[21]
- Vegetation;[22]
- Wildlife;[23]
- Federally- and state-listed species;[24]

[18] *See* Ex. A6 at 3 (Pawlowski Supplemental Direct); Ex. A7 at 2-3 (Pawlowski Rebuttal); Ex. A1 at §§ 27.1, 27.4 (Application); *see also, e.g.,* Ex. A1 at 9-3, 9-4, 12-6, 15-7 (Application).

[19] *See* Ex. A1 at § 11.1.2 (Application).

[20] *See* Ex. A1 at § 11.2.2 (Application).

[21] *See* Ex. A1 at §§ 12.1.2, 12.2.2, 12.2.3.2 (Application).

[22] *See* Ex. A1 at § 13.1.2 (Application).

[23] *See* Ex. A1 at § 13.4.2 (Application).

[24] *See* Ex. A1 at §§ 13.4.2.4, 14.3 (Application).

- Aquatic ecosystems;[25]
- Land use;[26]
- Recreation;[27]
- Conservation easements;[28]
- Noise;[29]
- Visual resources;[30]
- Telecommunications;[31]
- Air quality;[32]
- Socioeconomic and community resources;[33]
- Commercial, industrial, and agricultural sectors;[34]
- Transportation;[35] and,
- Cultural resources.[36]

The Project will also implement applicable avoidance and mitigation measures from the PEIS.[37] Staff also consulted with South Dakota Game, Fish and Parks ("GFP"), and that agency did not identify any concerns unique to the Project.[38]

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[25] *See* Ex. A1 at § 14.3 (Application).

[26] *See* Ex. A1 at § 15.1.2 (Application).

[27] *See* Ex. A1 at §§ 15.2.2, 15.4.2 (Application).

[28] *See* Ex. A1 at § 15.2.2 (Application).

[29] *See* Ex. A1 at § 15.3.4 (Application).

[30] *See* Ex. A1 at § 15.4.2 (Application).

[31] *See* Ex. A1 at § 15.6 (Application); Ex. A14 at 5 (Canty Rebuttal).

[32] *See* Ex. A1 at § 18.2 (Application).

[33] *See* Ex. A1 at §§ 20.1.2, 20.3.2 (Application).

[34] *See* Ex. A1 at §§ 20.1.2, 20.2.2 (Application).

[35] *See* Ex. A1 at § 20.4.2 (Application).

[36] *See* Ex. A1 at § 20.5.2 (Application).

[37] Evid. Hrg. Tr. at 441 (Canty). The PEIS is available online at: https://www.wapa.gov/regions/UGP/Environment/Pages/ProgrammaticWindEIS.aspx.

[38] Ex. S1 at 8 (Kearney Direct); Evid. Hrg. Tr. at 1119 (Kearney).

This evidence is set forth in the Application and applicable testimony and will not be restated here; rather, Prevailing Wind Park will address those specific and discrete issues which were the focus of the evidentiary hearing.

A. Environment.

1. Whooping Cranes.

The Project is located within an area where ten percent or less of whooping crane migration occurs.[39] To date, no whooping crane has died as the result of a wind turbine.[40] In response to questions from Commissioner Hanson at the evidentiary hearing, Prevailing Wind Park witnesses further described how the Project has been designed and will be operated to avoid impacts on the whooping crane. Specifically, the Project has committed to a curtailment program whereby, if a whooping crane is sighted within two miles of the Project, turbines will be shut down until the cranes leave the area.[41] There will be two ways to stop operation of the turbines. First, monitors may call the operations center and ask them to shut the turbines down.[42] Second, each monitor will have a laptop or tablet equipped with software that will allow him or her to shut down the turbines remotely if a whooping crane is sighted.[43] This software has been successfully implemented by sPower on another wind project.[44]

[39] Evid. Hrg. Tr. at 467 (Canty).

[40] Evid. Hrg. Tr. at 468 (Canty).

[41] Evid. Hrg. Tr. at 432 (Canty).

[42] Evid. Hrg. Tr. at 1142 (Pawlowski).

[43] Evid. Hrg. Tr. at 1142 (Pawlowski).

[44] Evid. Hrg. Tr. at 1142 (Pawlowski); *see also* Evid. Hrg. Tr. at 1165-67 (Pawlowski).

The Project has also committed to monitoring during the spring and fall migration periods.[45] The Project is coordinating with U.S. Fish and Wildlife Service regarding the specific timing of that monitoring and has also engaged a consultant to assist in that process.[46]

2. Aviation Detection Lighting System.

At the public input hearing, Prevailing Wind Park proposed to use an Aviation Detection Lighting System ("ADLS") for the Project, provided that the Federal Aviation Administration ("FAA") approves it.[47] The use of ADLS addresses the concerns raised at the evidentiary hearing and in public comments regarding the potential for "red flashing lights" on the Project, as are seen on existing wind projects.[48] ADLS involves the installation of radar units around the perimeter of a wind project. As long as the radar does not detect an aircraft, it keeps the wind turbine lighting turned off. When the radar detects aircraft, the wind turbine lighting activates.[49] The use of ADLS means that the Project will not introduce constant, flashing red lights into the area. Rather, the vast majority of the time, the lights will remain off.[50]

B. Social and Economic Condition.

The record also demonstrates that the Project will not pose a threat of serious injury to social and economic condition of inhabitants or expected inhabitants in the siting area. When considering this criterion in prior contested siting dockets, the Commission has considered the following socioeconomic issues: temporary and permanent jobs; tax revenue; and impacts on

[45] Evid. Hrg. Tr. at 432 (Canty).

[46] Evid. Hrg. Tr. at 468 (Canty).

[47] Pub. Hrg. Tr. at 14 (Pawlowski).

[48] *See, e.g.*, Evid. Hrg. Tr. at 1019 (Powers), 1036 (Andersh); Pub. Hrg. Tr. at 79 (Holborn); Comment by Gregg Hubner (July 9, 2018) (https://puc.sd.gov/commission/dockets/electric/2018/EL18-026/comments/Hubnerattachment.pdf).

[49] Ex. A6 at 5 (Pawlowski Supplemental Direct); *see also* Evid. Hrg. Tr. at 245 (Pawlowski).

[50] *See* Evid. Hrg. Tr. at 245 (Pawlowski).

commercial, agricultural, and industrial sectors, housing, land values, labor market, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities.[51] The record demonstrates that the Project will provide positive socioeconomic impacts when considering these factors.

For example, with respect to property values, Mr. Mike MaRous, a Member Appraisal Institute appraiser, testified that "there would be no negative impact on property values" as a result of the Project.[52] He further noted that the additional income from participating in the Project may actually increase the value and marketability of participating agricultural land.[53] This conclusion is also consistent with the Commission's recent findings regarding property values in the Crocker and Dakota Range wind farm proceedings.[54]

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[51] *See, e.g.*, *In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline*, Docket HP14-002, Final Decision and Order; Notice of Entry (Dec. 14, 2015) at ¶¶ 100-101; *see also In the Matter of the Application by TransCanada Keystone Pipeline, LP for a Permit Under the South Dakota Energy Conversion and Transmission Facilities Act to Construct the Keystone XL Project*, Docket HP09-001, Amended Final Decision and Order; Notice of Entry (June 29, 2010) at ¶¶ 107-110 (discussing socioeconomic effects, including tax revenue, jobs, and impacts on agricultural, commercial, and industrial sectors and public facilities); *In the Matter of the Application of Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶¶ 50-57; *In the Matter of the Application of Montana-Dakota Utilities Co. and Otter Tail Power Company for a Permit to Construct the Big Stone South to Ellendale 345 kV Transmission Line*, Docket EL13-028, Final Decision and Order; Notice of Entry (Aug. 22, 2014) ¶¶ 29-31 (discussing impacts to agriculture, property values, and local roads under this criterion).

[52] Evid. Hrg. Tr. at 292 (MaRous).

[53] Ex. A15 at 12 (MaRous Supplemental Direct).

[54] *See In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶¶ 53-55; *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) at ¶¶ 58-61.

In addition, the record demonstrates that the Project will, on the whole, have positive economic impacts on the community. For example, the Project is anticipated to result in up to 245 jobs during construction,[55] up to ten full-time permanent jobs,[56] and additional annual tax revenue for the state and local governments.[57]

The one alleged potential negative impact on social and economic conditions in the record was by Mr. Jerome Powers, relating to his guided hunting business. However, his testimony did not support his claims. During his testimony, Mr. Powers acknowledged that he owns less than 13 acres of land.[58] In the past, he has relied upon year-to-year leases for hunting rights on various properties.[59] He testified that some of those landowners have decided not to renew his leases for the coming year.[60] One of those landowners – Clearfield Colony – is a participating landowner in the Project. Mr. Powers attributes that landowner's decision not to renew his hunting lease to the Project.[61] However, each landowner has the right to decide whether to enter into a hunting lease for his/her property. Further, as acknowledged by Mr.

[55] Ex. A1 at 20-4 (Application).

[56] Evid. Hrg. Tr. at 277 (Pawlowski); *see also* Ex. A1 at 6-1 (Application).

[57] Ex. A1 at 20-3 – 20-4 (Application). At the evidentiary hearing, Commissioner Hanson questioned a portion of Mr. Damon's testimony (Ex. A6-3 (Damon Direct)) that included a calculation regarding the anticipated benefits of the Project. *See* Evid. Hrg. Tr. at 270-71. To clarify, the excerpt in question (on pages 15-16 of Ex. A6-3 (Damon Direct)) corresponds to page 20-4 of the Application, which states: "construction of the Project would create a $14.9 million boost to the local economy. Prevailing Wind Park estimates that $220,000 of food, supplies, and fuel would be purchased locally by the Project and Project staff annually (or $20.4 million over the life of the Project)." The $20.4 million total cited in Mr. Damon's testimony and the Application includes the $14.9 million *plus* the $220,000 in annual purchasing over the life of the Project. Thus, there was no calculation error in Mr. Damon's direct testimony; however, it could have been more clearly stated.

[58] Evid. Hrg. Tr. at 1017 (Powers).

[59] Evid. Hrg. Tr. at 1017, 1023-24 (Powers).

[60] Evid. Hrg. Tr. at 1024, 1028 (Powers).

[61] Evid. Hrg. Tr. at 1029-30 (Powers).

Powers, the Project does not prohibit or otherwise restrict hunting.[62] Thus, it is Mr. Powers' ownership of limited acreage and his need to hunt on others' land that affects his hunting business, and not the Project.

Although there was discussion at the evidentiary hearing regarding disagreements concerning the Project within the community, these differences of opinion should not impact the Commission's analysis of whether the Project poses a "threat of serious injury to . . . social and economic condition." While Prevailing Wind Park acknowledges that the Project has both supporters and detractors, this is not unique to this Project. As the Commission has seen in the past, with almost any energy infrastructure project, there is not unanimous support for the Project. This was true for the Crocker and the Dakota Range projects, as it has been for other infrastructure projects approved by the Commission.[63] There are residents in the Project Area who do not support the Project, some of whom participated in these proceedings to advocate for

[62] Evid. Hrg. Tr. at 1018 (Powers).

[63] *See, e.g., In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) (two intervenors participated in the evidentiary hearing); *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) (two intervenors participated in the evidentiary hearing); *In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline*, Docket HP14-002, Final Decision and Order; Notice of Entry (Dec. 14, 2015) (50 intervenors participated in the evidentiary hearing); *In the Matter of the Application by TransCanada Keystone Pipeline, LP for a Permit Under the South Dakota Energy Conversion and Transmission Facilities Act to Construct the Keystone XL Project*, Docket HP09-001, Amended Final Decision and Order; Notice of Entry (June 29, 2010) (15 intervenors participated in the evidentiary hearing); *In the Matter of the Application by Buffalo Ridge II LLC, a Subsidiary of Iberdola Renewables, Inc. for an Energy Conversion Facility Permit for the Construction of the Buffalo Ridge II Wind Farm and Associated Collection Substation and Electric Interconnection System*, Docket EL08-031, Final Decision and Order; Notice of Entry (April 23, 2009) (six Intervenors participated in the evidentiary hearing); *In the Matter of the Application of Montana-Dakota Utilities Co. and Otter Tail Power Company for a Permit to Construct the Big Stone South to Ellendale 345 kV Transmission Line*, Docket EL13-028, Final Decision and Order; Notice of Entry (Aug. 22, 2014) (three intervenors participated in the evidentiary hearing).

their views. However, the fact that people intervened and participated in the proceeding is not indicative of negative impacts to the social and economic condition of inhabitants or expected inhabitants in the siting area. Such a conclusion would ignore the merits of the concerns raised, and would look solely to the number of opponents, which is inconsistent with the purpose of the Commission's evidentiary process.

Moreover, while the intervenors voiced their concerns, the Commission also heard the testimony of landowners who do support the Project, and they explained their reasons for participating in the Project. These reasons included: positive experiences with the existing Beethoven Wind Project; tax revenue for local governments; support for renewable energy;[64] expanded opportunities for local residents; and, community investment.[65] Ms. Peters and Mr. Brandt also testified that, although there is disagreement among some area residents regarding the Project, the discourse has been civil; Mr. Brandt stated: "It's not like there's a huge thing there. I mean, there's people for it. There's people against it. But life goes on. In the end we're all still Avon residents."[66] This is similar to testimony both from Prevailing Wind Park and intervenors – people may have differences of opinion concerning the Project, but it is no more than is to be expected from an energy infrastructure project and is not anticipated to have permanent impacts on the community.[67] In addition, Prevailing Wind Park is committed to

[64] Evid. Hrg. Tr. at 187, 200 (Peters).

[65] *See* Evid. Hrg. Tr. at 394-98 (Brandt).

[66] Evid. Hrg. Tr. at 403-04 (Brandt); *see also id.* at 419-20 (Brandt) ("There is always some controversy with a project, but, as I stated before, I believe when this is all said and done, whether it is built or not, we are all still a community. I mean, these people are my neighbors. They're still going to be my neighbors when this is all said and done. So I do not believe that there's been so much [*word unclear*] that we can't get along and go about life.").

[67] *E.g.*, Evid. Hrg. Tr. at 257 (Pawlowski) ("So what I have observed is that there are people who are unhappy about the project, and they are, you know, of similar numbers that I've seen in other projects and other interventions in projects."); Evid. Hrg. Tr. at 945-46 (Schoenfelder) ("I made a commitment early in this process that I would want to be treated the way other people want to be treated. I hope that

continuing outreach and dialogue in the community regarding the Project, as Mr. Pawlowski testified on the final day of the evidentiary hearing.[68] Thus, taken as a whole, the record supports the conclusion that the Project does not pose a threat to the social and economic condition of the community.

III. THE PROJECT WILL NOT SUBSTANTIALLY IMPAIR HEALTH, SAFETY, OR WELFARE.

The record demonstrates that the Project will not substantially impair health, safety, or welfare. Further, the record demonstrates that the Project has been designed to minimize the potential for health, safety, and welfare impacts. The primary issues at the evidentiary hearing related to shadow flicker, sound, general health effects, and ice throw. Prevailing Wind Park provided testimony from highly qualified and experienced medical doctors: Dr. Jeff Ellenbogen, a Harvard-trained neurologist and former professor at Johns Hopkins University; and Dr. Mark Roberts, a medical doctor and Ph.D. epidemiologist with an extensive public health background.[69] Each doctor independently concluded that the Project will not cause adverse health effects or impact sleep.[70] The testimony of these two doctors was unrefuted in the record—there was no other medical testimony by a qualified expert. In fact, when intervenors, Mr. and Mrs. Hubner and Mr. and Mrs. Schoenfelder ("Intervenors"), attempted to introduce testimony regarding health effects through Dr. Punch and Mr. James, that testimony was

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other people feel the same way. These are my neighbors. A lot of those neighbors are taking the stands for a lot of different reasons. They're not evil people. I just -- I -- I refuse to -- I refuse to hate anyone through this process.").

[68] Evid. Hrg. Tr. at 1139-40, 1145-46 (Pawlowski).

[69] *See* Ex. A4-1 (Roberts Statement of Qualifications); Evid. Hrg. Tr. at 87 (Roberts); Ex. A18-1 (Ellenbogen Statement of Qualifications); Evid. Hrg. Tr. at 318-19 (Ellenbogen).

[70] *See, e.g.*, Ex. A4 at 15-16 (Roberts Supplemental Direct); Ex. A18 at 4-5, 12 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 106-07 (Roberts), 328, 360-61 (Ellenbogen).

properly excluded.[71] Prevailing Wind Park also provided unchallenged testimony regarding turbine operations and ice throw coupled with a General Electric publication[72] that showed that the Project has complied with recommended safety setbacks and that the risk of ice throw is low. Each of these issues is discussed in more detail below.

A. Flicker.

Shadow flicker from wind turbines occurs when wind turbine blades rotate and pass in front of the sun. Shadow flicker occurs only under very specific conditions, and shadow flicker intensity and frequency at a given receptor are determined by a number of interacting factors, such as sun position, wind direction, turbine and receptor locations, time of day, and other similar factors. As separation between a turbine and receptor increases, shadow flicker intensity will generally diminish by a corresponding amount as shadows diffuse and become imperceptible.[73]

Flicker is common in the world – it is not only caused by wind turbines.[74] Flicker also does not cause adverse health effects, including seizures. Both Dr. Roberts and Dr. Ellenbogen provided testimony on this issue, explaining that the frequency of shadow flicker from wind turbines is not the frequency that induces epileptic seizures.[75] More specifically, photic-simulated epilepsy (seizures as a result of flashes of light) occurs as a result of frequencies

[71] *See* Order Redacting Exhibits and Testimonies (Nov. 1, 2018).

[72] Ex. A31, "Setback Considerations for Wind Turbine Siting" (Applicant's Updated Responses to Intervenors' Data Requests).

[73] Ex. A2 at 3-4 (Anderson Direct).

[74] Evid. Hrg. Tr. at 94 (Roberts) ("I think that to back up for a minute and talk about it, is flicker, light flicker in general. We are surrounded by light flicker. This monitor in front of me right now is flickering at probably about 75 hertz. The lights above us, if they're fluorescent are probably about 125 hertz."); *id.* at 151 (Roberts) ("We are all exposed to flicker. And I think the one thing I would recommend is carefully consider that shadow flicker is no different than flicker from other devices except for the emotional attachment that it may have to the source.").

[75] *See* Ex. A18 at 5 (Ellenbogen Rebuttal); *see also* Evid. Hrg. Tr. at 94, 154, 159 (Roberts).

greater than 5 hertz ("Hz").[76] In contrast, the frequency of shadow flicker from wind turbines would be about 0.5-1 Hz, which is well below the range that would elicit a seizure even in someone who is vulnerable to photic stimulation seizures.[77]

Shadow flicker modeling for the Project predicted the following results at intervenors' residences:

Name & Address	Receptor ID	Flicker (Hours/Year)	Flicker (Minutes/Day)
Gregg & Marsha Hubner	REC-047	0	0
Paul & Lisa Schoenfelder	REC-139	6.15	26
Sherman & Lori Fuerniss	REC-068	3.13	24
	REC-069	3.20	24
Karen Jenkins	REC-121	0	0
Kelli Pazour	REC-024	6.20	31

Consistent with industry standard, Prevailing Wind Park has committed to limiting shadow flicker at non-participating residences in the Project Area to no more than 30 hours per year.[78] In addition – beyond industry standard – Prevailing Wind Park has also committed to limiting shadow flicker at non-participating residences in the Project Area to no more than 30 minutes per day.[79] Where shadow flicker exceeds the commitments made by Prevailing Wind Park, the Project will use turbine control software to comply with that commitment.[80] Specifically, the software will shut a turbine down before it exceeds the committed shadow flicker limits and will

[76] Ex. A18 at 5 (Ellenbogen Rebuttal).

[77] Ex. A18 at 5 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 154 (Roberts).

[78] Evid. Hrg. Tr. at 42-43 (Anderson); Ex. A2 at 4 (Anderson Direct); Evid. Hrg. Tr. at 207 (Pawlowski); Applicant's and Staff's Revised Joint Recommended Condition 28.

[79] *See* Evid. Hrg. Tr. at 42-43, 73, 81 (Anderson); Evid. Hrg. Tr. at 207 (Pawlowski); Applicant's and Staff's Revised Joint Recommended Condition 28.

[80] Applicant's and Staff's Revised Joint Recommended Condition 28; Evid. Hrg. Tr. at 207-08 (Pawlowski).

not turn the turbine back on until the shadow flicker at that location has ended.[81] As shown above, the predicted annual hours of shadow flicker at the intervenors' residences are well below the 30-hour-per-year commitment. Further, only one residence would potentially exceed 30 minutes per day, which will be addressed by the turbine control software Prevailing Wind Park has committed to install and use.[82]

At the evidentiary hearing, there were questions why 30 hours per year was the appropriate shadow flicker limit. However, neither the State of South Dakota nor the federal government currently regulates wind turbine shadow flicker.[83] Similarly, none of the counties in which the Project will be located has specific shadow flicker limits. As described above, 30 hours per year is a consistent, accepted standard within the industry.[84] This standard is commonly applied in regulatory proceedings in other jurisdictions.[85]

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[81] Evid. Hrg. Tr. at 207-08 (Pawlowski); *see also* Evid. Hrg. Tr. at 54 (Anderson) ("It's part of the machine itself, and it's simply a modification of the control software for the turbine. And we can modify that so that if the flicker above a certain threshold occurs, whether that's hours per year, minutes per day, et cetera, we can adjust the turbine control settings and, simply put, tell it not to operate or to operate in a different way.").

[82] *See* Ex. A7 at 4 (Pawlowski Rebuttal).

[83] Evid. Hrg. Tr. at 84 (Anderson).

[84] Evid. Hrg. Tr. at 81, 83-84 (Anderson); *see also* Evid. Hrg. Tr. at 1127 (Kearney) ("Ultimately what I looked at was what the county was comfortable with as being a nuisance issue and if they were comfortable with 30 hours without some study saying that's right or wrong, I was comfortable with that.").

[85] *See, e.g., In the Matter of the Application of Freeborn Wind Energy LLC for a Large Wind Energy Conversion System Site Permit for the up to 84 MW Freeborn Wind Farm in Freeborn County*, MPUC Docket WS-17-410, Department of Commerce Energy Environmental Review and Analysis ("EERA") Comments and Recommendations on Draft Site Permit at 18 (December 5, 2017) (eDocket No. 201712-137950-01) ("Some of the comments indicated that non-participants should not experience more than 30 hours of shadow flicker per year. 30 hours of flicker per year was a suggested standard in a couple sources of information reviewed by EERA, but those sources do not provide supporting scientific data that would suggest there is a link between shadow flicker in excess of 30 hours per year of exposure and negative human health impacts."); *In the Matter of the Application of Lindahl Wind Project, LLC's Application for a Certificate of Site Compatibility for the Lindahl Wind Farm Project in Williams County, North Dakota*, Docket PU-15-482, North Dakota Public Service Commission Findings of Fact, Conclusions of Law and Order, (Dec. 2, 2016) at Order ¶ 8.

B. Sound.

1. Audible Sound.

In both the Dakota Range and Crocker dockets, the Commission required that the Project sound meet a 45 dBA level at non-participating residences and a 50 dBA level at participating residences.[86] As set forth in Attachment B, Applicant's Proposed Sound Condition, Prevailing Wind Park proposes the same condition in this proceeding for Hutchinson County and Bon Homme County, which has a 45 dBA limit for non-participating residences.[87] For Charles Mix County, Prevailing Wind Park proposes a 43 dBA limit on non-participant residences and 45 dBA limit for participating residences unless a signed waiver is obtained from the owner of the residence consistent with the commitment made to the county.[88] In addition, Dr. Ellenbogen and Dr. Roberts, the only medical doctors to offer testimony, testified that a level of 45 dBA will not cause adverse health impacts or affect sleep.[89] Thus, the 45 dBA limit at non-participants' residences is consistent with prior dockets, consistent with Bon Homme County's requirements, and fully supported on the record.

Mr. Howell, who was retained by Prevailing Wind Park to independently model the predicted sound levels for the Project,[90] testified that this limit is one of the most restrictive

[86] *In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at Attachment A, ¶ 27; *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) at Attachment A, ¶ 29.

[87] *See* Ex. A1 at 9-4 (Application); Applicant's Proposed Sound and Charles Mix Conditions.

[88] Prevailing Wind Park also proposes a condition in Attachment B that Applicant must comply with other commitments made to Charles Mix County.

[89] For additional discussion of evidence related to health concerns, see Section III(C)(2) below.

[90] Evid. Hrg. Tr. at 509 (Howell).

sound limits he has seen and that, based on his modeling, the Project will meet these limits.[91] By way of comparison, both Mr. Howell and Mr. Hessler testified that the sound level in the hearing room when no one was talking was approximately 40 dBA.[92]

Mr. Howell's modeling was conservative, meaning that the sound levels predicted in his study will not ever happen on a continuous basis.[93] Mr. Howell has also measured sound levels at operating projects; thus, the modeling methodology he used has been tested and confirmed in the field.[94] In addition, the modeled sound from the Project is significantly below 45 dBA at Intervenors' residences. Indeed, Mr. Hessler testified that the levels identified for Intervenors below are "extremely quiet:"[95]

Name & Address	Receptor ID	Modeled Sound (LAeq)
Gregg & Marsha Hubner	REC-047	28.5
Paul & Lisa Schoenfelder	REC-139	35.5
Sherman & Lori Fuerniss	REC-068 REC-069	35.8 36.0
Karen Jenkins	REC-121	28.4
Kelli Pazour	REC-024	34.2

[91] Evid. Hrg. Tr. at 493, 509, 511 (Howell); *see also* Ex. A10 at 2 (Howell Rebuttal).

[92] Evid. Hrg. Tr. at 493 (Howell); Evid. Hrg. Tr. at 716 (Hessler).

[93] Evid. Hrg. Tr. at 520-21 (Howell); Ex. A9 at 7 (Howell Direct) ("Our modeling utilized conservative assumptions and was conducted in accordance with the international standard (ISO 9613-2), which is used for projecting outdoor sound levels from specific sources. . . . This is a conservative method because, in the model, each receiver is downwind of every source, a scenario that cannot physically occur. Additionally, the modeling did not include attenuation for sound propagation through wooded areas, existing barriers, and shielding, and assumed that all turbines were operating at maximum power output . . . at all times to represent worst-case noise impacts from the wind farm as a whole. These assumptions were made to maintain the inherent conservativeness of the model and to estimate the worst-case modeled sound levels.").

[94] Evid. Hrg. Tr. at 489, 511-12 (Howell); *see also* Ex. A9 at 8 (Howell Direct) ("Our own post-construction studies have demonstrated that our pre-construction conservative prediction methods typically exceed actual operational sound levels of proposed projects."); *see also* Ex. A9 at 9 (Howell Direct) ("In-house and third-party monitoring has routinely demonstrated that our prediction methods are conservative, and monitoring results are typically between 1 and 3 dBA lower than our predictions.").

[95] Evid. Hrg. Tr. at 722 (Hessler) ("35's extremely quiet and no one would be bothered.").

In his prefiled testimony, Staff's witness Mr. Hessler agreed that the 45 dBA limit was appropriate, stating, "[i]n my experience 45 dBA is an appropriate and reasonably fair *regulatory* noise limit for wind projects at non-participating residences generally balancing the interests of [] both the community and developers."[96] Mr. Hessler further explained:

> In general, in the course of testing newly operational wind projects for noise compliance and talking with residents at the closest and most impacted houses, I find that noise is not an issue for the vast majority of residents living in or near the turbine array, but also that it is not possible to please everyone. At almost every project that I'm familiar with there is one person or a few people that are extremely upset with project noise, largely irrespective of the specific sound level at their house. Consequently, there really isn't a regulatory sound level that would satisfy everyone.[97]

At the evidentiary hearing, however, Mr. Hessler advocated for another goal, claiming that he would "like to see the project shoot for this 40" dBA.[98] Yet, Mr. Hessler continued to acknowledge that 45 dBA is "a reasonable limit under normal circumstances. When there's not a lot of opposition."[99] When asked about why he had determined there was "a lot of opposition" for this Project, Mr. Hessler referred to the time it took him to read intervenors' submissions.[100] Thus, based on Mr. Hessler's logic, a regulatory body should impose increasingly restrictive sound limits based on the volume of materials submitted by opponents to a project, in the hopes of anticipatorily reducing *potential* complaints. Mr. Hessler's speculation about potential complaints is not workable for the Commission, and it is not supported by this record, for a number of reasons.

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[96] Ex. S3 at 4 (Hessler Direct) (emphasis added).

[97] Ex. S3 at 4 (Hessler Direct).

[98] Evid. Hrg. Tr. at 721-22 (Hessler).

[99] Evid. Hrg. Tr. at 727 (Hessler).

[100] Evid. Hrg. Tr. at 729 (Hessler).

First, no party to the docket is challenging the Project because of anticipated sound levels above 40 dBA. The levels at Intervenors' residences have been modeled generally at or below 35 dBA, a level which Mr. Hessler described as "extremely quiet" at which "no one would be bothered."[101]

Second, Mr. Hessler states that the Project should "shoot for" 40 dBA because it took him a long time to read intervenors' submissions. However, the Commission should consider that substantial portions of Intervenors' experts' testimonies are not actually part of this record; significant portions of the testimonies of Dr. Punch and Mr. James were excluded, and Intervenors withdrew the testimony of Dr. Alves-Pereira. Following Mr. Hessler's logic, parties who "dump" documents and information into the Commission's proceedings, regardless of their relevance and reliability would be rewarded; the Commission should not incentivize this practice, as it is counter to the purpose of an evidentiary proceeding.

Third, Mr. Hessler and Intervenors' witnesses referred to the eight-turbine Shirley Wind Project several times in their testimonies as evidence regarding the potential for complaints from a wind project. However, none of those witnesses acknowledged that, after extensive study and rule-making, the Wisconsin Public Service Commission was unpersuaded to implement the lower sound level for which Mr. Hessler advocated.[102] The Wisconsin Public Service Commission adopted the following requirement: "[A]n owner shall operate the wind energy system so that the noise attributable to the wind energy system does not exceed 50 dBA during daytime hours and 45 dBA during nighttime hours."[103]

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[101] Evid. Hrg. Tr. at 722 (Hessler).

[102] *See* Evid. Hrg. Tr. at 729 (Hessler) and Wisc. Admin. Code § PSC 128.14(3)(a).

[103] Wisc. Admin. Code § PSC 128.14(3)(a).

Finally, adopting Mr. Hessler's recommendation would create substantial uncertainty for the Commission, developers, and residents going forward. In essence, Mr. Hessler recommended that the Commission adopt a regulatory requirement based solely on his perceived risk of future complaints. This is not a reasonable basis for establishing a sound requirement. It is also contradicted by Mr. Hessler's own testimony that there is no limit that could be set to avoid sound complaints.[104]

2. Infrasound.

Apart from audible sound, Intervenors expressed concern about infrasound. The record demonstrates that: (1) infrasound from wind turbines is not perceivable by humans; and (2) there is no scientific evidence that infrasound causes adverse health effects.

Infrasound, which is also referred to as low frequency sound, is sound between 0 Hz and 20 Hz.[105] A level of 20 Hz is commonly considered the low end of the range of human hearing.[106] Infrasound is generated by both natural and man-made sources, including HVAC systems and the human heart and lungs.[107] At *very high* levels, the levels created by jet engines and bomb blasts, infrasound can cause adverse health effects.[108] By contrast, however, wind turbines result in very low levels of infrasound, more akin to infrasound levels produced by human organs. More specifically, for example, heart sounds are in the range of 27 to 35 dBA at

[104] Evid. Hrg. Tr. at 726-27, 780 (Hessler); *see also* Ex. S3 at 4 (Hessler Direct).

[105] Ex. A4 at 17 (Roberts Supplemental Direct).

[106] Ex. A4 at 17 (Roberts Supplemental Direct). In addition, Exhibit A40 is a graphic showing the relationship between sound pressure levels (dB) and frequency (Hz) as it relates to human hearing. As indicated on the graphic, sound pressure levels must be above 100 dB for humans to hear at very low frequencies.

[107] Ex. A4 at 17 (Roberts Supplemental Direct).

[108] Evid. Hrg. Tr. at 150 (Roberts) (describing effects of sound levels of 110-120 dB from jet engines); Evid. Hrg. Tr. at 375-76 (Ellenbogen) (describing blast injuries experienced by veterans from sound pressure levels exceeding 110 dB).

20-40 Hz, which is in the range of sound produced by wind turbines.[109] Infrasound is not unique to wind turbines, nor is the infrasound from wind turbines unique or distinct from infrasound produced by other sources at similar levels.[110] More simply, infrasound from the human heart is no different than infrasound from wind turbines from a human health perspective.[111] Overall, as Dr. Roberts testified, "infrasound – both man-made and naturally-occurring – [is] all around us."[112]

The evidence in this record demonstrates that there is no scientific evidence that infrasound at the levels produced by wind turbines causes adverse health effects.[113] There have been numerous studies analyzing wind turbine effects; none of these studies have found a causal relationship between wind turbine infrasound and human health effects.[114] Dr. Roberts explained

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[109] Ex. A4 at 17 (Roberts Supplemental Direct).

[110] *See* Evid. Hrg. Tr. at 177 (Roberts); Ex. A4 at 17 (Roberts Supplemental Direct); Ex. A5 at 6-7 (Roberts Rebuttal).

[111] Evid. Hrg. Tr. at 177 (Roberts).

[112] Ex. A4 at 17 (Roberts Supplemental Direct); *see also* Evid. Hrg. Tr. at 169 (Roberts) ("If we begin to have regulations about infrasound, we're going to have to consider the other sources. Our lungs, our heart, our diaphragm, my GI tract all make low frequency sounds. My joints make low frequency sounds as well."); Evid. Hrg. Tr. at 171 (Roberts) ("Infrasound is caused by a large number of different natural and technical sources. It is every day part of our environment that can be found everywhere. Wind turbines make no considerable contribution to it. The infrasound levels generated by them lie clearly below the limits of human perception. There is no scientifically proven evidence of adverse effects in this level range.").

[113] *See* Ex. A18 at 4-5 (Ellenbogen Rebuttal) ("None of the limited epidemiological evidence reviewed suggested an association between noise from wind turbines and a wide range of topics we considered: pain, stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and/or headache/migraine. In addition, claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. . . . We did not find evidence in the human or animal literature to support that vibrations of the kind produced by a wind turbine could influence the vestibular system."); Ex. A4 at 16 (Roberts Supplemental Direct) ("the levels of sound and infrasound from wind turbines are significantly lower than those that have been shown to cause harm."); *see also* Evid. Hrg. Tr. at 118, 171-72 (Roberts); Evid. Hrg. Tr. at 327, 375-76 (Ellenbogen).

[114] *See* Evid. Hrg. Tr. at 118, 135, 139-40, 143, 160-62, 171-74 (Roberts); *see also* Ex. A5 at 7 (Roberts Rebuttal); Ex. A18 at 5 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 516-17 (Howell) ("In general the absolute values that we're talking about for this wind farm don't require any further analysis of low frequency noise, in my opinion. . . . In this scenario we looked at dBA and I did an off the cuff look at the

why there are not potential adverse health effects from the sound, including infrasound, of wind turbines:

> [T]he levels of sound and infrasound from wind turbines are significantly lower than those that have been shown to cause harm. Substantial research has been done on sound level exposure to humans. . . . [T]his same science has not identified a causal link between any specific health condition and exposure to the sound patterns generated by contemporary wind turbine models. In addition to my own conclusions, several other respected organizations and agencies have reached similar conclusions.[115]

Mr. Hessler also noted that there are more than 90,000 MW of installed wind power in the United States involving more than 50,000 wind turbines, with *self-reported* adverse health effect complaints at only a very small number of those turbines.[116]

Overall, Intervenors presented no evidence to rebut the testimony provided by Mr. Hessler, Mr. Howell, Dr. Roberts, and Dr. Ellenbogen (as well as the numerous reliable studies relied upon by those witnesses) that demonstrated that: (1) infrasound from wind turbines is below the level generally perceivable by humans;[117] and (2) there is no scientific evidence that

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dB(C) values as well and none of the values exceeded that recommended differential to determine if there's a low frequency component. So I would not expect a significant low frequency component here.").

[115] Ex. A4 at 16 (Roberts Supplemental Direct); *see also* Ex. A5 at 8 (Roberts Rebuttal) ("[W]ind turbines are sources of infrasound and low sound frequencies, but no exceedance of the audibility thresholds in the areas of infrasound and low frequencies up to 50 Hz has been found.").

[116] Ex. S3 at 7 (Hessler) ("According to the latest quarterly report of the American Wind Energy Association there are now over 90,000 MW of installed wind power in this country involving more than 50,000 wind turbines. To my knowledge, instances of apparent adverse health effects from wind turbines have occurred at only a small handful of sites with only a few turbines each, such as Falmouth in Massachusetts (three 1.5 MW GE units) and Shirley Wind in Wisconsin (eight 2.5 MW Nordex units).").

[117] Intervenors repeatedly referenced a study conducted on guinea pigs to argue that wind turbine infrasound could be detected and/or somehow impact the inner ear. This study is neither relevant nor helpful, as Dr. Ellenbogen explained. First, it has nothing to do with adverse health effects. Evid. Hrg. Tr. at 386 (Ellenbogen) ("I actually don't have confidence that the study is relevant for this panel for two reasons. One, because of the animal comparison and also because it was not about health effects. It was about perception."). Second, there are significant differences between the inner ears of guinea pigs and humans. Evid. Hrg. Tr. at 386, 389-90 (Ellenbogen).

infrasound at the levels produced by wind turbines causes adverse health effects. Notably, although Dr. Punch asserted to the contrary in his prefiled testimony, he was unable to provide any support for those statements at the evidentiary hearing, even when directly asked by Commissioner Nelson.[118]

C. Other Health Concerns.

1. The Commission Appropriately Excluded the Testimony of Mr. James and Dr. Punch Regarding Health Effects.

Intervenors submitted pre-filed testimony from three individuals – Mr. James, Dr. Punch, and Dr. Alves-Pereira. Each of these individuals, in one form or another, attempted to opine on the health effects of wind turbines. At the hearing, however, it became clear that neither Mr. James nor Dr. Punch was qualified to opine on health effects, and the hearing examiner appropriately so limited their testimony. With respect to Mr. James:

- He is not a medical doctor.[119]
- He is not a licensed physician.[120]
- He is not a licensed psychologist.[121]
- He has not conducted a medical evaluation on any of the people that have provided complaints to him. [122]
- He did not provide credible literature supporting his assertions regarding alleged health effects.[123]

With respect to Dr. Punch:

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[118] Evid. Hrg. Tr. at 918 (Punch) ("I cannot cite at this point – I was basing that on information I had then, but I don't recall what I was basing it on at this point.").

[119] Evid. Hrg. Tr. at 823 (James).

[120] Evid. Hrg. Tr. at 821-22 (James).

[121] Evid. Hrg. Tr. at 822 (James).

[122] Evid. Hrg. Tr. at 823 (James).

[123] *See* Evid. Hrg. Tr. at 825-27 (James).

- He is not a medical doctor.[124]
- He does not have any expertise to diagnose non-hearing-related maladies such as heart disease.[125]
- He has not conducted medical evaluations of any of the people that have provided complaints to him.[126]
- He does not have the training or expertise to diagnose individuals.[127]
- He did not provide credible literature supporting his assertions regarding alleged health effects.[128]

Intervenors then chose, without explanation, to withdraw Dr. Alves-Pereira as a witness on the day she was expected to testify. As such, that testimony is not part of this record.

2. The Record Evidence Establishes that the Project Will Not Substantially Impair Health.

In contrast to Mr. James and Dr. Punch, Drs. Roberts and Ellenbogen *are* medical doctors and have substantial training and experience assessing health effects. Specifically, Dr. Roberts has a Ph.D. in Biostatistics and Epidemiology, as well as a medical degree; he has decades of experience in the areas of public health and occupational medicine, including approximately 18 years in the Oklahoma State Department of Health (which included serving as the State Epidemiologist for three years).[129] Similarly, Dr. Ellenbogen has a medical degree from Tufts University and a master's in medical science from Harvard Medical School; he specializes in

[124] Evid. Hrg. Tr. at 897 (Punch).

[125] Evid. Hrg. Tr. at 899 (Punch).

[126] Evid. Hrg. Tr. at 901-02 (Punch).

[127] Evid. Hrg. Tr. at 898-99, 903 (Punch).

[128] Evid. Hrg. Tr. at 901, 904 (Punch). For example, the paper authored by Mr. James and Dr. Punch and which both referred to in their testimony was not peer-reviewed, as that phrase is typically used. *See* Ex. A5 at 17-18 (Roberts Rebuttal).

[129] Ex. A4 at 2-3 (Roberts Supplemental Direct); Ex. A4-1 (Roberts Statement of Qualifications); Evid. Hrg. Tr. at 87-88 (Roberts).

neurology and sleep health.[130] Both Dr. Roberts and Dr. Ellenbogen testified that there is no scientific evidence that wind turbines cause adverse health effects.[131]

More specifically, as Drs. Roberts and Ellenbogen testified, wind turbines do not cause vertigo, induce epileptic seizures, cause or worsen Attention-Deficit/Hyperactivity Disorder, or, at the sound levels anticipated for this Project, cause sleep disturbance.[132] These conclusions are the same ones that have been reached by well-respected, governmental agencies charged with protecting public health that have evaluated the available evidence and concluded that wind turbines are not a cause of adverse health effects.[133] For example, the Australian National Health and Medical Research Council concluded that there is no consistent evidence that wind turbines cause adverse health effects in humans.[134] Similarly, the Wisconsin Siting Council concluded that no association between wind turbines and health effects has been scientifically shown.[135] Researchers at the Lawrence Berkeley National Laboratory also found no link between wind turbines and adverse health effects.[136] In addition, an independent expert panel for Massachusetts (which included Dr. Ellenbogen) found that there was insufficient evidence that

[130] Ex. A18 at 1 (Ellenbogen Rebuttal); Ex. A18-1 (Ellenbogen Statement of Qualification); Evid. Hrg. Tr. at 318-19 (Ellenbogen).

[131] *See, e.g.*, Evid. Hrg. Tr. at 89, 92, 129 (Roberts); Ex. A4 at 4 (Roberts Supplemental Direct); Ex. A5 at 7-8 (Roberts Rebuttal); Evid. Hrg. Tr. at 360-61, 366-67, 382 (Ellenbogen); Ex. A18 at 4-5, 12 (Ellenbogen Rebuttal).

[132] Ex. A4 at 18 (Roberts Supplemental Direct); Evid. Hrg. Tr. at 154, 159-60 (Roberts); Ex. A18 at 5, 12 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 327, 364-65, 377-78 (Ellenbogen).

[133] *See* Ex. A4 at 4, 12-14 (Roberts Supplemental Direct); Ex. A5 at 7 (Roberts Rebuttal).

[134] Ex. A4 at 12-13 (Roberts Supplemental Direct).

[135] Ex. A4 at 13 (Roberts Supplemental Direct).

[136] Ex. A4 at 13 (Roberts Supplemental Direct).

noise from wind farms directly causes health problems or disease.[137] The South Dakota Department of Health has also relied upon the Massachusetts's study's conclusion.[138]

With respect to sleep disturbance specifically, Dr. Ellenbogen referred to a recent study from Health Canada, which found no evidence of sleep disruption from wind turbines at up to 46 dBA:[139]

> This demonstrated sensitivity, together with the observation that there was consistency between multiple measures of self-reported sleep disturbance and among some of the self-reported and actigraphy measures, lends strength to the robustness of the conclusion that [wind turbine noise] levels ***up to 46 dB(A) had no statistically significant effect on any measure of sleep quality***.[140]

Notably, the modeled sound at all residences within the Project Area is less than 45 dBA – in most cases, far less than 45 dBA – in accordance with the requirements of Bon Homme County and Prevailing Wind Park's commitment to Charles Mix County.

Overall, the record shows that Prevailing Wind Park has met its burden to demonstrate that the Project will not substantially impair human health; indeed, there is no scientific evidence in the record that the Project would impair human health (substantially or insubstantially). Although Intervenors provided some testimony concerning speculative health concerns, the large body of reliable and authoritative and unchallenged medical evidence refutes these claims.[141]

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[137] Ex. A4 at 13-14 (Roberts Supplemental Direct); Ex. A18 at 4-5 (Ellenbogen Rebuttal).

[138] *See In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Exhibit S1 at DK-4, Letter, Kim Malsam-Rysdon, Secretary of Health, South Dakota Department of Health (Oct. 13, 2017) ("These studies generally conclude that there is insufficient evidence to establish a significant risk to human health.").

[139] *See* Evid. Hrg. Tr. at 364-65 (Ellenbogen) (emphasis added).

[140] Ex. A39 at 107 (Michaud et al., Effects of Wind Turbine Noise on Self-Reported and Objective Measures of Sleep (2016)) (emphasis added).

[141] For example, Intervenors solicited testimony from individuals regarding other wind projects (Scott Rueter, Vickie May). These witnesses clearly have strong feelings about wind projects; however,

D. Turbine Blade Icing.

Icing on wind turbines blades is sometimes raised as a safety issue with respect to wind projects.[142] Based on the five years of weather data collected for the Project Area, Prevailing Wind Park anticipates that the Project may experience up to 15 icing days per year.[143] Although icing can occur on turbine blades during freezing rain conditions, it is not common and is generally controlled by ice detection systems on the turbines.[144] Project turbines will include the standard turbine control system on each turbine, as well as an additional purchased accessory software package, including Turbine Computer Monitoring ("TCM").[145] The turbine controller senses when the rotor revolutions per minute are not consistent with the measured wind speed (which may occur as the buildup of ice breaks the perfected aerodynamic shape of the blade).[146] The turbine controller then evaluates the temperature and recognizes that icing conditions may exist. The TCM system measures vibration on many components of the turbine and, when it senses vibration above pre-set levels, the turbine automatically shuts down.[147] This shutdown will occur in less than two minutes from the time icing is detected.[148] The turbine will not attempt to restart until conditions (temperature) become favorable or human intervention occurs.[149]

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well-regarded medical research and literature – relied upon by many other regulatory bodies – refutes any claims they may be making regarding health issues and wind turbines.

[142] Ex. A17 at 2 (Creech Rebuttal).

[143] Evid. Hrg. Tr. at 525 (Creech).

[144] Ex. A17 at 2 (Creech Rebuttal).

[145] Ex. A17 at 2 (Creech Rebuttal).

[146] Ex. A17 at 2-3 (Creech Rebuttal); Evid. Hrg. Tr. at 541-42 (Creech).

[147] Ex. A17 at 2-3 (Creech Rebuttal); Evid. Hrg. Tr. at 538-39, 541-42 (Creech).

[148] Evid. Hrg. Tr. at 558 (Creech).

[149] Ex. A17 at 3 (Creech Rebuttal); *see also* Evid. Hrg. Tr. at 556-57, 558 (Creech).

The evidence presented in the record demonstrates that Project setbacks and the proposed permit condition regarding turbine icing will protect human health and safety. Specifically, Mr. Creech testified that the farthest distance he is aware of ice being thrown from a turbine is approximately 250 feet.[150] The Project is set back at least 649.61 feet (1.1 times the tip height of the tower) from non-participating property lines and roads, in conformance with General Electric's Setback Considerations for Wind Turbine Siting.[151] In Hutchinson and Bon Homme Counties, the Project is set back at least 1,000 feet from non-participating residences. Per Prevailing Wind Park's commitments to Charles Mix County, Project turbines are set back at least 3.5 times the system height or 2,000 feet, whichever is greater, from non-participating residences in Charles Mix County.[152] Indeed, even the closest participating residence to a turbine is more than 1,550 feet away.[153] In addition, Prevailing Wind Park has agreed to the same turbine icing condition as the Commission imposed in the Dakota Range proceeding, which requires Prevailing Wind Park to use two methods to detect icing conditions on turbine blades.[154]

Intervenors relied on an outdated article to assert that ice throw may occur as far as 6,500 feet away from a 20 MW wind turbine.[155] Such a machine is not proposed for the Project, nor does it exist. As such, the document is irrelevant. Rather, the real-world data and experience, coupled with the manufacturer recommendations and turbine control software, show that the Project as designed is appropriately sited and will minimize the potential for ice throw.

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[150] Ex. A17 at 3 (Creech Rebuttal).

[151] Ex. A17 at 5 (Creech Rebuttal) and Ex. A31 (Applicant's Updated Responses to Intervenors' Data Requests).

[152] Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski).

[153] Ex. A42 (Distance from Each Residence to the Nearest Wind Turbine, Modeled Shadow Flicker and Sound Pressure Levels).

[154] Ex. A17 at 4 (Creech Rebuttal).

[155] *See* Ex. A28 at 1 and Attachment B (Intervenors' Responses to Staff's Second Set of Data Requests); Evid. Hrg. Tr. at 533-34 (Creech).

IV. THE PROJECT WILL NOT UNDULY INTERFERE WITH ORDERLY DEVELOPMENT IN THE REGION.

The record demonstrates that the Project will not unduly interfere with orderly development in the vicinity of the Project. As an initial matter, as discussed above, the evidence shows that the Project will have substantial positive economic benefits in the area. Further, the Project complies with all applicable local land use requirements, and the evidence demonstrates that Prevailing Wind Park has worked cooperatively with local governments, even where no local land use controls existed. Specifically: Bon Homme County granted a Large Wind Energy System approval for the Project on August 21, 2018; Hutchinson County granted conditional use approvals for the Project on September 4, 2018; and, the Project received building permits from Charles Mix County in July 2018 and has worked with Charles Mix County to address concerns regarding the Project.[156] Prevailing Wind Park executed an affidavit memorializing its commitments to Charles Mix County; this affidavit binds Prevailing Wind Park but imposes no obligations on Charles Mix County.[157]

Intervenors take issue with the development of zoning regulations relevant to the Project and even went so far as to subpoena local officials to testify at the evidentiary hearing. Prevailing Wind Park continues to believe that zoning ordinance development issues are not relevant to this proceeding. That said, the testimony from local officials demonstrated that those local officials listened to all stakeholders and consulted many different resources before thoughtfully making their decisions.[158] Even Mr. Hubner testified that he was dissatisfied with the outcome of such proceedings – not the process itself: "Well, I never contended their

[156] Ex. A7 at 1 (Pawlowski Rebuttal).

[157] Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski); Evid. Hrg. Tr. at 253 (Pawlowski).

[158] Evid. Hrg. Tr. at 685-93 (Soukup); Evid. Hrg. Tr. at 696-703 (Mushitz).

procedure. I mean, I – whether they made a mistake or didn't make a mistake as they were doing this. How they did it was really not an issue for me. It's what they did and who they listened to."[159] Overall, the evidence shows that the local proceedings were robust and that local officials took pains to ensure that everyone had a voice in their processes. There is no reason to second-guess the local officials or their zoning decisions.

V. OTHER ISSUES.

A. Turbine Model.

Prevailing Wind Park provided evidence to support the need for turbine model flexibility. As discussed previously herein, Prevailing Wind Park requests the flexibility to use the GE 2.3 MW turbine model for up to nine turbines instead of the larger GE 3.8 MW model. [160]

Prevailing Wind Park has proposed, and Commission Staff supports,[161] the following permit condition on how it would address the change in turbine model and demonstrate compliance with all of the conditions of the permit for the Project:

> Not less than 30 days prior to commencement of construction work in the field for the Project, Applicant will provide to Commission staff the following information:
>
> a. the most current preconstruction design, layout, turbine model, and plans;
>
> b. a sound level analysis showing compliance with the applicable sound level requirements;
>
> c. a shadow flicker analysis showing the anticipated shadow flicker levels will not exceed 30 hours per year and/or 30 minutes per day at any non-participating residence and an affidavit from the Applicant identifying the turbine numbers that will be operationally controlled in order to meet the shadow flicker requirements;

[159] Evid. Hrg. Tr. at 979 (Hubner).

[160] Evid. Hrg. Tr. at 209 (Pawlowski).

[161] This condition was separately submitted as Ex. A33 and has been incorporated into Applicant's and Staff's Revised Joint Recommended Conditions as Condition 29.

> d. such additional Project preconstruction information as Commission staff requests; and
>
> e. should Applicant decide at a later point to use a different turbine model, it shall provide the information required in parts a-d above.[162]

B. Micrositing Flexibility.

Prevailing Wind Park provided evidence to support the need for micrositing flexibility for associated facilities.[163] Staff and Prevailing Wind Park have agreed to the following condition:

> Applicant may adjust access roads, the collector system, meteorological towers, the operations and maintenance facility, the Project substation, and temporary facilities, so long as they are located on land leased for the Project, cultural resources and documented habitats for listed species are avoided, and wetland impacts are avoided or are in compliance with applicable USACE regulations.[164]

Prevailing Wind Park notes that met towers were initially inadvertently omitted from this proposed condition. However, met tower flexibility was requested in the Application,[165] and Staff subsequently agreed to include met towers in this proposed condition. The accompanying Staff and Applicant Proposed Conditions (Revised) reflects this change.

CONCLUSION

The record demonstrates that Prevailing Wind Park has met its burden of proof to establish that: (1) the Project will comply with applicable laws and rules; (2) the Project does not pose a threat of serious injury to the environment or social and economic condition; (3) the

[162] Applicant's and Staff's Revised Joint Recommended Condition 29.

[163] *See* Ex. A1 at 8-3 (Application).

[164] Applicant's and Staff's Revised Joint Recommended Condition 24.

[165] Ex. A1 at 8-3 (Application) ("As a result of final micrositing, shifts in the access roads and collector system, as well as changes in the locations of the O&M facility, Project substation, meteorological towers, concrete batch plant, and laydown/staging areas, may be necessary. Therefore, the Applicant requests that the permit allows those facilities to be modified, as needed, as long as the new locations are on land leased for the Project, cultural resources and habitats for listed species are avoided, wetland impacts are avoided to the extent practicable, and other applicable regulations and requirements are met.").

Project will not substantially impair health, safety, or welfare; and (4) the Project will not unduly interfere with orderly development. The record further demonstrates that, in addition to meeting those criteria, the Project will benefit local landowners and the community. Accordingly, Prevailing Wind Park respectfully requests that the Commission grant an Energy Facility Permit for the Project on the terms and conditions set forth in the accompanying Attachment A, Applicant's and Staff's Revised Joint Recommended Conditions, and Attachment B, Applicant's Proposed Sound and Charles Mix County Conditions.

Dated this 13th day of November, 2018.

By /s/ *Lisa M. Agrimonti*

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Attorneys for Prevailing Wind Park, LLC

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PERMIT CONDITIONS JOINTLY PROPOSED BY APPLICANT AND STAFF[1]

Prevailing Wind Park, LLC, Docket No. EL18-026

1. Applicant will obtain all governmental permits which reasonably may be required by any township, county, state or federal agency, or any other governmental unit for construction and operation activity of the Project prior to engaging in the particular activity covered by that permit. Copies of any permits obtained by Applicant shall be sent to the Commission.

2. Applicant shall construct, operate, and maintain the Project in a manner consistent with (1) descriptions in the Application, (2) Application supplements, (3) responses to any data requests, (4) the Final Decision and Order Granting Permit to Construct Wind Energy Facility, Attachment A-Permit Conditions, (5) any applicable industry standards, (6) any permits issued by a federal, state, or local agency, and (7) evidence presented by Applicant at the evidentiary hearing.

3. Applicant shall complete the Western Area Power Administration (WAPA) environmental review process as required by the National Environmental Policy Act. Further, Applicant shall comply with and implement any requirements or commitments set forth in the WAPA NEPA review. The Applicant expects environmental review to be composed of an Environmental Assessment and that Applicant would be required to comply with applicable mitigation measures set forth in the Upper Great Plains Wind Energy Programmatic Environmental Impact Statement.

4. Applicant agrees that the Commission's complaint process as set forth in ARSD Chapter 20:10:01 shall be available to landowners and other persons sustaining or threatened with damage as the result of Applicant's failure to abide by the conditions of the Permit or otherwise having standing to seek enforcement of the conditions of the Permit. Participating landowners are free to use the complaint process free from retribution or consequence regardless of any private easement term to the contrary.

5. At least 14 days prior to commencement of construction, Applicant shall provide each participating and non-participating landowner in the Project Area with the following information:

    a) A copy of the Final Decision and Order Granting Permit to Construct Wind Energy Facility;

    b) Detailed safety information describing:

        1) Reasonable safety precautions for existing activities on or near the Project;

        2) Known activities or uses that are presently prohibited near the Project, and

[1] Changes to the conditions in Exhibit A32 are shown in track-change format.

3) Other known potential dangers or limitations near the Project;

c) Construction/maintenance damage compensation plans and procedures;

d) The Commission's address, website, and phone number;

e) Contact person for Applicant, including name, e-mail address, and phone number.

6. In order to ensure compliance with the terms and conditions of this Permit pursuant to SDCL 49-41B-33, it is necessary for the enforcement of this Order that all employees, contractors, and agents of Applicant involved in this Project be made aware of the terms and conditions of this Permit.

7. Except as otherwise provided in the Permit Conditions, Applicant shall comply with all mitigation measures set forth in the Application and Applicant's responses to Commission staff data requests. Material modifications to the mitigation measures shall be subject to prior approval of the Commission.

8. Applicant will negotiate road use agreements with Bon Homme County, Hutchinson County and Charles Mix County, and all affected townships, if required. Applicant will follow the terms of all road use agreements. Applicant shall take appropriate action to mitigate wind-blown particles created throughout the construction process, including but not limited to implementation of dust control measures such as road watering, covering of open haul trucks when transporting material subject to being windblown, and the removal of any soils or mud deposits by construction equipment when necessary.

9. Applicant shall comply with the following conditions regarding road protection:

a) Applicant shall acquire all necessary permits authorizing the crossing of federal, state, county, and township roads.

b) Applicant shall coordinate road closures with federal, state, and local governments and emergency responders.

c) Applicant shall implement a regular program of road maintenance and repair through the active construction period to keep paved and gravel roads in an acceptable condition for residents and the public.

d) After construction, Applicant shall repair and restore deteriorated roads resulting from construction traffic or compensate governmental entities for their repair and restoration of deteriorated roads, such that the roads are returned to their preconstruction condition.

e) Within 180 days of completing construction and reclamation of the Project, Applicant shall submit documentation to the Commission identifying that the roads were repaired in accordance with this Condition 8 and to the satisfaction of affected townships and counties. If the townships or counties will not provide such documentation, then Applicant shall provide a report to the Commission on the outstanding road repair issues and how those issues will be resolved.

f) Privately owned areas used as temporary roads or crane paths during construction will be restored to their preconstruction condition, except as otherwise requested or agreed to by the landowner.

g) Should Applicant need to widen any existing roadways during construction of the Project, Applicant shall return the roadways back to original width after completion of the Project, unless agreed upon otherwise with the federal, state, county, or township entities, or the landowner.

h) Applicant shall use appropriate preventative measures to prevent damage to paved roads and to remove excess soil or mud from such roadways.

10. Applicant shall provide signage that identifies road closures and disturbances resulting from the Project in accordance with the most recent editions of the Manual on Uniform Traffic Control Devices as published by the Federal Highway Administration.

11. Applicant shall promptly report to the Commission the presence of any critical habitat of threatened or endangered species in the Project area that Applicant becomes aware of and that was not previously reported to the Commission.

12. Applicant agrees to avoid direct impacts to cultural resources that are unevaluated, eligible for or listed in the National Register of Historic Places (NRHP). When a NRHP unevaluated, eligible or listed site cannot be avoided, Applicant shall notify SHPO and the Commission of the reasons that complete avoidance cannot be achieved in order to coordinate minimization and/or treatment measures.

13. Applicant agrees to develop an unanticipated discovery plan for cultural resources and follow SDCL 34-27-25, 34-27-26, and 34-27-28.

14. Applicant shall file the final cultural resources report with the Commission prior to construction. If any potential adverse impacts to NRHP unevaluated, listed, or eligible cultural resources are identified in the final cultural resources report, Applicant shall file with the Commission a report describing the SHPO-approved planned measures to ameliorate those impacts.

15. Applicant shall provide the Stormwater Pollution Prevention Plan (SWPPP) to the Commission when Applicant has a final design for the Project. The SWPPP will outline the water and soil conservation practices that will be used during construction to prevent or minimize erosion and sedimentation. The SWPPP will be completed before submittal of an application for a National Pollutant Discharge Elimination System (NPDES) general permit for construction activities. All contractors to be engaged in ground disturbing activities will be given a copy of the SWPPP and requirements will be reviewed with them prior to the start of construction.

16. Applicant shall repair and restore areas disturbed by construction or maintenance of the Project. Except as otherwise agreed to by the landowner, restoration shall include replacement of original pre-construction topsoil or equivalent quality topsoil to its original elevation, contour, and compaction and re-establishment of original vegetation as close thereto as reasonably practical. In order to facilitate compliance with this Permit Condition, Applicant shall:

a) Strip topsoil to the actual depth of the topsoil, or as otherwise agreed to by the landowner in writing (e-mail is sufficient), in all areas disturbed by the Project; however, with respect to access roads, Applicant may remove less than the actual depth of topsoil to ensure roads remain low-profile and the contours align with the surrounding area;

b) Store topsoil separate from subsoil in order to prevent mixing of the soil types;

c) All excess soils generated during the excavation of the turbine foundations shall remain on the same landowner's land, unless the landowner requests, and/or agrees, otherwise; and

d) When revegetating non-cultivated grasslands, Applicant shall use a seed mix that is recommended by the Natural Resource Conservation Service (NRCS), or other land management agency, unless otherwise agreed upon with the landowner in writing.

17. Applicant shall work closely with landowners or land management agencies, such as the NRCS, to determine a plan to control noxious weeds.

18. Applicant shall stage construction materials in a manner that minimizes the adverse impact to landowners and land users as agreed upon between Applicant and landowner or Applicant and the appropriate federal, state, and/or local government agency. All excess construction materials and debris shall be removed upon completion of the Project, unless the landowner agrees otherwise.

19. In order to mitigate interference with agricultural operations during and after construction, Applicant shall locate all structures, to the extent feasible and prudent, to minimize adverse impacts and interferences with agricultural operations, shelterbelts, and other land uses or activities. Applicant shall take appropriate precautions to protect livestock and crops during construction. Applicant shall repair all fences and gates removed or damaged during construction or maintenance unless otherwise agreed with the landowner or designee. Applicant shall be responsible for the repair of private roads damaged when moving equipment or when obtaining access to the right-of-way.

20. Applicant shall bury the underground collector system at a minimum depth of four feet, or deeper if necessary, to ensure the current land use is not impacted.

21. Applicant shall repair or replace all property removed or damaged during all phases of construction, including but not limited to, all fences, gates, and utility, water supply, irrigation or drainage systems. Applicant shall compensate the owners for damages or losses that cannot be fully remedied by repair or replacement, such as lost productivity and crop and livestock losses. All repair, replacement and/or compensation described above shall be in accordance with the terms and conditions of written agreements between Applicant and affected landowners where such agreements exist.

22. Applicant shall, in the manner described in its written agreement with a landowner, indemnify and hold the landowner harmless for loss, damage, claim, or actions resulting from Applicant's use of the easement, including any damage resulting from any release, except to the extent such loss, damage claim, or action results from the negligence or

willful misconduct of the landowner or his employees, agents, contractors, invitees, or other representatives.

23. Applicant may make turbine adjustments of 250 feet or less from the turbine locations identified in the Application without prior Commission approval, so long as specified noise and shadow flicker thresholds are not exceeded, cultural resource impacts and documented habitats for listed species are avoided, and wetland impacts are avoided or are in compliance with applicable U.S. Army Corps of Engineers (USACE) regulations. Prior to implementing the turbine adjustment, Applicant will file in the docket an affidavit demonstrating compliance with the limitations set forth above. Any turbine adjustment that does not comply with the aforesaid limitations would be considered a "material change," and Applicant shall file a request for approval of the "material change" prior to making the adjustment pursuant to the following approval process:

- Applicant will file with the Commission and serve on the official Service List a request for approval of the adjustment that includes:
  - An affidavit describing the proposed turbine adjustment, the reason for the adjustment, the reason the adjustment does not comply with one or more turbine flexibility limitations set forth above, and information regarding compliance with all other applicable requirements; and
  - A map showing both the approved location and the proposed adjustment (in different colors);
- Once received, the information would be reviewed by Commission staff, and Commission staff will have 10 calendar days within which to request further Commission review.
- If no further review is requested, Applicant may proceed with the adjustment.
- If further review is requested, the Commission will issue a decision regarding Applicant's request at its next available regularly scheduled Commission meeting, subject to notice requirements, after the request for further review is made by Commission staff.

24. Applicant may adjust access roads, the collector system, meteorological towers, the operations and maintenance facility, the Project substation, and temporary facilities, so long as they are located on land leased for the Project, cultural resources and documented habitats for listed species are avoided, and wetland impacts are avoided or are in compliance with applicable USACE regulations.

25. If the Project causes interference with radio, television, or any other licensed communication transmitting or receiving equipment, Applicant shall take all appropriate action to minimize any such interference and shall make a good faith effort to restore or provide reception levels equivalent to reception levels in the immediate areas just prior to construction of the Project. This mitigation requirement shall not apply to any dwellings or other structures built after completion of the Project.

26. Applicant will provide Global Positioning System (GPS) coordinates of structure locations to affected landowners at any time during the life of the Project. Coordinates will be provided in writing to landowners within 30 days of a request.

27. [Sound Condition]

28. Applicant shall install turbine control equipment on the Project's turbines that allows for individual turbines to be shut down as necessary to ensure that shadow flicker does not exceed 30 hours per year and/or 30 minutes per day at non-participating residencies. Applicant shall also take steps to mitigate shadow flicker concerns at any residence that could experience shadow flicker levels above 30 hours per year or 30 minutes per day.

29. Not less than 30 days prior to commencement of construction work in the field for the Project, Applicant will provide to Commission staff the following information:

    a) the most current preconstruction design, layout, turbine model and plans;

    b) a sound level analysis showing compliance with the applicable sound level requirements;

    c) a shadow flicker analysis showing the anticipated shadow flicker levels will not exceed 30 hours per year and/or 30 minutes per day at any non-participating residence and an affidavit from the Applicant identifying the turbine numbers that will be operationally controlled in order to meet the shadow flicker requirements; ~~and~~

    d) such additional Project preconstruction information as Commission staff requests; and

    ~~d)~~e) should Applicant decide at a later point to use a different turbine model, it shall provide the information required in parts a-d above.~~.~~

30. Within 90 days after the Project's commercial operation date, Applicant shall submit a report to the Commission that provides the following information:

    a) as-built location of structures and facilities, including drawings clearly showing compliance with the setbacks required by state and local governments and the voluntary commitments set forth in Table 9-2 of the Application;

    b) the status of remedial activities for road damage, landowner property damage, crop damage, environmental damage, or any other damage resulting from Project construction activities; and

    c) a summary of known landowner complaints and Applicant's plan for resolving those complaints.

31. For purposes of this Project and the commitments herein, "residences," "businesses," and "public buildings" shall include only those that are in existence and in use as of the date of the Commission's order issuing a permit. "Business" shall not include agricultural uses.

32. Applicant shall seek input from local emergency response personnel to properly and effectively coordinate an emergency response plan consistent with local resources and response abilities. Upon completion of construction, a Project operation emergency response plan shall be provided to Commission staff to make available to the general public on the Commission's website.

33. Prior to the construction of the Project, Applicant will notify public safety agencies by providing a schedule and the location of work to be performed within their jurisdiction. The agencies contacted will include the South Dakota Department of Public Safety, the sheriff in Hutchinson, Charles Mix and Bon Homme counties and the Office of Emergency Management in Hutchinson, Charles Mix and Bon Homme counties.

34. Applicant agrees to undertake two years of independently-conducted post-construction avian mortality monitoring for the Project, and to provide a copy of the report to the USFWS, GFP, and the Commission.

35. The Bird and Bat Conservation Strategy (BBCS) developed for the Project shall be implemented during construction and operation of the Project.

36. At least thirty days prior to commencement of construction, Applicant shall submit the identity and qualifications of a public liaison officer to the Commission for approval to facilitate the exchange of information between Applicant, including its contractors, and landowners, local communities, and residents, and to facilitate prompt resolution of complaints and problems that may develop for landowners, local communities, and residents as a result of the Project. Applicant shall file with the Commission its proposed public liaison officer's credentials for approval by the Commission prior to the commencement of construction. After the public liaison officer has been approved by the Commission, the public liaison officer may not be removed by Applicant without the approval of the Commission. The public liaison officer shall be afforded immediate access to Applicant's on-site project manager, its executive project manager, and to the contractors' on-site managers and shall be available at all times to Commission staff via mobile phone to respond to complaints and concerns communicated to the Commission staff by concerned landowners and others. As soon as Applicant's public liaison officer has been appointed and approved, Applicant shall provide contact information for him/her to all landowners in the Project area and to law enforcement agencies and local governments in the vicinity of the Project. The public liaison officer's contact information shall be provided to landowners in each subsequent written communication with them. If the Commission determines that the public liaison officer has not been adequately performing the duties set forth for the position in this Order, the Commission may, upon notice to Applicant and the public liaison officer, take action to remove the public liaison officer. The public liaison's services shall terminate ninety days after the Project commences commercial operations, unless the appointment is extended by order of the Commission.

37. If the Project is decommissioned, Applicant will follow Section 24 of the Application, and the decommissioning plan attached to the Supplemental Direct Testimony of Daniel Pardo. The Commission shall be notified prior to any decommissioning action.

38. Applicant will use two methods to detect icing conditions on turbine blades: (1) sensors that will detect when blades become imbalanced or create vibration due to ice accumulation; and (2) meteorological data from on-site permanent meteorological

towers, on-site anemometers, and other relevant meteorological sources that will be used to determine if ice accumulation is occurring. These control systems will either automatically shut down the turbine(s) in icing conditions (per the sensors) or Applicant will manually shut down turbine(s) if icing conditions are identified (using meteorological data). Turbines will not return to normal operation until the control systems no longer detect an imbalance or when weather conditions either remove icing on the blades or indicate icing is no longer a concern. The Applicant will pay for any documented damage caused by ice thrown from a turbine.

39. Applicant shall utilize an Aircraft Detection Lighting System if approved by the Federal Aviation Administration.

40. At least 30 days prior to construction Applicant shall file a plan with the Commission for Commission approval that provides a decommissioning escrow account. The plan shall provide as follows:

a) The escrow account is funded by the turbine owner annually at a rate of $5,000 per turbine per year for the first 10 years, commencing no later than the commercial operation date.

b) Beginning in year ten following commercial operation of the project and each fifth year thereafter, the turbine owner shall submit the Commission an estimated decommissioning date, if established, and estimated decommissioning costs and salvage values. Based on the verification of the information in the filing the Commission may require additional funding in order to match the estimated amount needed for decommissioning.

c) All interest earned by the account remains in the account.

d) An account statement is provided annually to the Commission and becomes a public record in this docket.

e) The escrow account obligations will be those of Prevailing Wind Park and the escrow agreement shall include terms providing that the agreement binds Prevailing Wind Park's successors, transferees, and assigns. Also, a sale of project assets would be expected to include the associated Permit which would require Commission approval per SDCL § 49-41B-29.

f) The escrow account agent shall have an office located in South Dakota.

g) The escrow agreement shall be subject to the laws of South Dakota and any disputes regarding the agreement shall be venued in South Dakota.

h) To minimize the risk that the escrow account would be subject to foreclosure, lien, judgment, or bankruptcy, the escrow agreement will be structured to reflect the follow factors:

1) That Prevailing Wind Park agreed to the creation of the escrow account;

2) Prevailing Wind Park exercises no (or the least amount possible of) control over the escrow;

3) The initial source of the escrow;

4) The nature of the funds put into the escrow;

5) The recipient of its remainder (if any);

6) The target of all its benefit; and

7) The purpose and its creation.

i) Account funds are to be paid to the project owner at the time of decommissioning to be paid out as decommissioning costs are incurred and paid.

j) If the project owner fails to execute the decommissioning requirement found in section 40 of the Conditions, the account is payable to the landowner who owns the land on which associated project facilities are located as the landowner incurs and pays decommissioning costs.

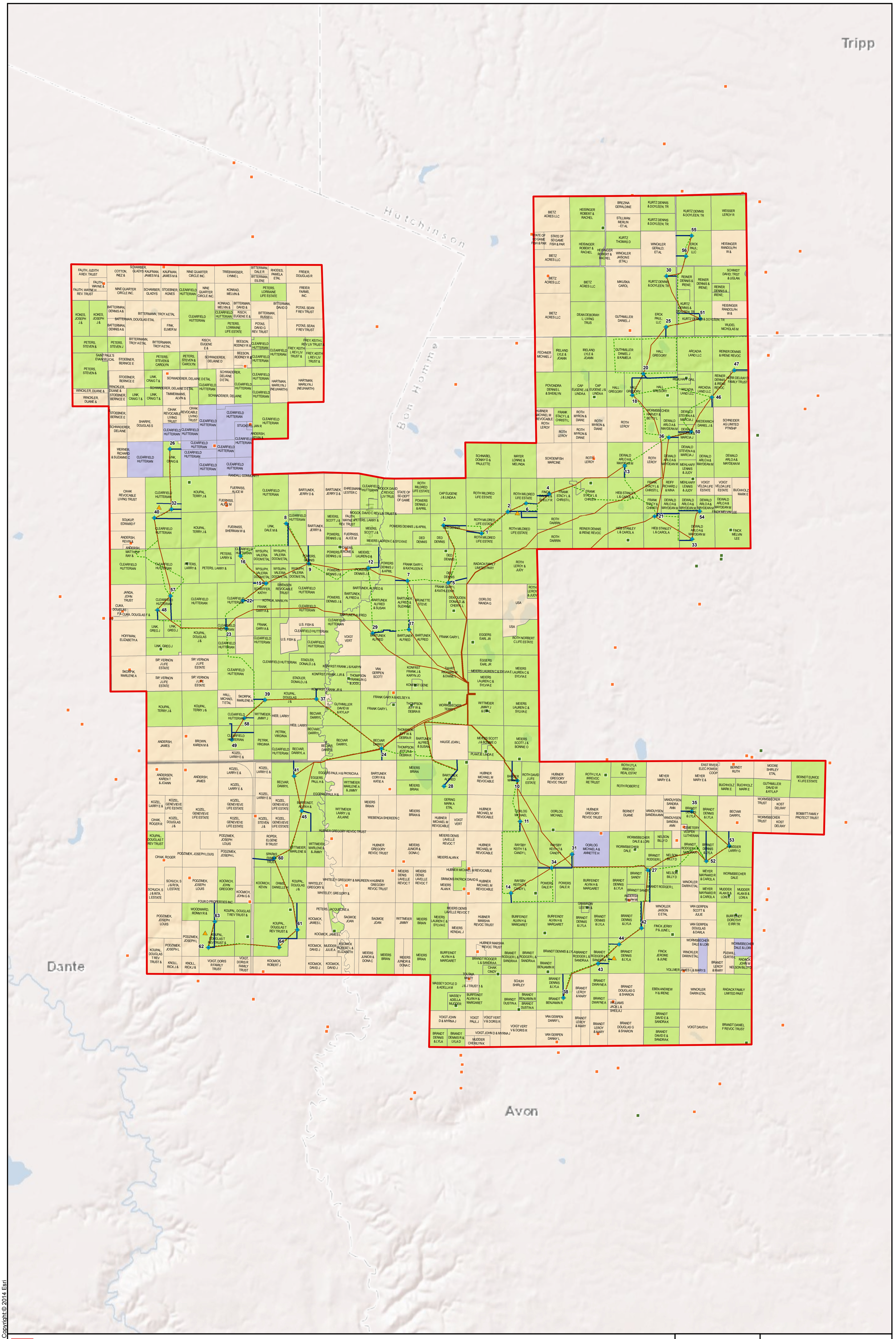
41. The terms and conditions of the Permit shall be made a uniform condition of construction, subject only to an affirmative written request for an exemption addressed to the Commission. A request for an exemption shall clearly state which particular condition should not be applied to the property in question and the reason for the requested exemption. The Commission shall evaluate such requests on a case-by-case basis, which evaluation shall be completed within 60 days unless exigent circumstances require action sooner.

APPLICANT'S PROPOSED SOUND AND CHARLES MIX CONDITIONS

Prevailing Wind Park, LLC, Docket No. EL18-026

27. In Bon Homme and Hutchinson Counties, the Project, exclusive of all unrelated background noise, shall not generate a long-term average sound pressure level (equivalent continuous sound level, Leq), as measured over a period of at least two weeks, defined by Commission staff, that includes all integer wind speeds from cut in to full power, of more than 45 dBA within 25 feet of any residence, or 50 dBA if the owner of the residence has signed a waiver or granted an easement. In Charles Mix County, the sound level may not exceed 43 dBA at any non-participating residence or 45 dBA at any participating residence, unless a signed waiver is obtained from the owner of the residence. Applicant shall, upon Commission formal request, conduct field surveys or provide post-construction monitoring data verifying compliance with specified noise level limits using applicable American National Standards Institute (ANSI) methods. If the long-term average level exceeds 45 dBA at any participating residence, or 50 dBA where the owner of the residence has signed a waiver or easement in Bon Homme and Hutchinson counties, or 43 dBA at any non-participating residence or 45 dBA at any participating residence unless there is a signed waiver in Charles Mix County, then the Applicant shall take whatever steps are necessary in accordance with prudent operating standards to rectify the situation. Sound monitoring will not be repeated in a representative area during any five-year period unless operational or maintenance changes result in a reasonable assumption of higher turbine sound levels.

[Unnumbered] Applicant shall comply with all commitments made to Charles Mix County in the Affidavit of Peter Pawlowski dated August 9, 2018.


Tripp
Hutchinson
Bon Homme
Dante
Avon
Project Area
MET Tower
Turbine
Public, commercial, and institutional use (i.e., church)
Access Road
Collector Line
Crane Path
Residences
Participating
Non Participating
Parcel Status
Leased
Non-Participating
Setback
NORTH
3,000 1,500 0 3,000
Scale in Feet
BURNS McDONNELL
Revised Layout
Prevailing Wind Park
Wind Energy Facility
SDPUC Application
Source: Source: ESRI, Burns & McDonnell Engineering Company, Inc., South Dakota GIS, Prevailing Winds, LLC
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BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN BON HOMME COUNTY, CHARLES MIX COUNTY, AND HUTCHINSON COUNTY, SOUTH DAKOTA, FOR THE PREVAILING WIND PARK ENERGY FACILITY	* * * * * * * *	**PREVAILING WIND PARK, LLC'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER** **EL18-026**

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BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC FOR A PERMIT OF A WIND ENERGY FACILITY IN BON HOMME COUNTY, CHARLES MIX COUNTY, AND HUTCHINSON COUNTY, SOUTH DAKOTA, FOR THE PREVAILING WIND PARK ENERGY FACILITY	* * * * * * * *	**PREVAILING WIND PARK, LLC'S PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW AND ORDER** **EL18-026**

APPEARANCES

Commissioners Kristie Fiegen, Gary Hanson, and Chris Nelson.

Mollie Smith and Lisa Agrimonti, Fredrikson & Byron, P.A., 200 South Sixth Street, Minneapolis, Minnesota 55402, appeared on behalf of the Applicant, Prevailing Wind Park, LLC ("Prevailing Wind Park" or "Applicant").

Kristen Edwards and Amanda Reiss, 500 E. Capitol Ave., Pierre, South Dakota 57501, appeared on behalf of the South Dakota Public Utilities Commission Staff ("Staff").

Reece Almond, Davenport, Evans, Hurwitz & Smith, LLP, 206 West 14th Street, Sioux Falls, South Dakota, 57101, appeared on behalf of Intervenors Gregg Hubner, Marsha Hubner, Lisa Schoenfelder, and Paul Schoenfelder ("Intervenors").

Sherman Fuerniss appeared on behalf of himself.

Kelli Pazour appeared on behalf of herself.

Karen Jenkins appeared on behalf of herself.

PROCEDURAL HISTORY

On May 30, 2018, Prevailing Wind Park filed an Application for an Energy Facility Permit for an up to 219.6 megawatt ("MW") nameplate capacity wind energy facility to be located in Hutchinson County, Bon Homme County, and Charles Mix County, South Dakota, known as the Prevailing Wind Park Project ("Project") with the South Dakota Public Utilities Commission ("Commission").[1] Also on May 30, 2018, Prevailing Wind Park filed the pre-filed

[1] *See* Ex. A1 (Application).

direct testimony of James Damon, Bridget Canty, Keith Thorstad, Aaron Anderson, and Chris Howell.

On June 1, 2018, the Commission issued a Notice of Application; Order for and Notice of Public Input Hearing; Notice of Opportunity to Apply for Party Status.

On June 21, 2018, Prevailing Wind Park filed a certificate of service confirming it had sent copies of the Application and Prevailing Wind Park's pre-filed direct testimony to the Bon Homme, Charles Mix, and Hutchinson county auditors.

On June 21, 2018, Prevailing Wind Park filed a Proof of Mailing to affected landowners demonstrating compliance with the requirements of South Dakota Codified Law 49-41B-5.2.

On June 29, 2018, the Commission issued an Order assessing Prevailing Wind Park a filing fee in an amount not to exceed $348,500, with a minimum filing fee of $8,000. In the same Order, the Commission further voted unanimously to authorize the executive director to enter into necessary consulting contracts.

On July 12, 2018, a public input hearing was held as scheduled.

On July 19, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in the *Tripp Star Ledger* on June 6, 2018 and June 13, 2018.

On July 19, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in the *Yankton Daily Press and Dakotan* on June 6, 2018 and June 13, 2018.

On July 19, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in the *Scotland Journal* on June 6, 2018 and June 13, 2018.

On July 19, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in the *Avon Clarion* on June 6, 2018 and June 13, 2018.

On July 19, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in *The Wagner Post* on June 6, 2018 and June 13, 2018.

On July 20, 2018, Staff submitted a Motion for Adoption of Procedural Schedule.

The Commission received seven (7) applications for party status by the July 30, 2018 deadline.

On August 2, 2018, Prevailing Wind Park filed a Response to Staff's Motion for Adoption of Procedural Schedule.

On August 8, 2018, Affidavits of Publication were filed confirming that the Notice of Public Hearing was published in the *Tripp Star Ledger* on June 20, 2018 and July 11, 2018.

On August 8, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in the *Yankton Daily Press and Dakotan* on June 20, 2018 and July 11, 2018.

On August 8, 2018, Affidavits of Publication were filed confirming that the Notice of Public Hearing was published in the *Avon Clarion* on June 20, 2018 and July 11, 2018.

On August 8, 2018, an Affidavit of Publication was filed confirming that the Notice of Public Hearing was published in *The Wagner Post* on June 20, 2018 and July 11, 2018.

On August 9, 2018, the Commission issued an Order Granting Party Status and Establishing Procedural Schedule. The Commission granted party status to: Marsha Hubner, Gregg Hubner, Lisa Schoenfelder, Paul Schoenfelder, Charles Mix County, Sherman Fuerniss, and Karen Jenkins.

On August 10, 2018, Prevailing Wind Park filed the pre-filed supplemental testimony of Bridget Canty, Dr. Mark Roberts, Michael MaRous, Daniel Pardo, and Peter Pawlowski.

On August 28, 2018, Kelli Pazour filed an application for party status.

On September 10, 2018, Staff filed the pre-filed testimony of David Hessler, David Lawrence, and Darren Kearney.

On September 10, 2018, Intervenors filed Intervenors' Disclosure of Lay Witnesses and the pre-filed testimony of Richard R. James,[2] Jerry L. Punch,[3] and Mariana Alves-Pereira.[4]

On September 11, 2018, Intervenor Karen Jenkins filed a letter stating that she intends to testify only if called as a witness, but reserves the right to submit testimony.

On September 11, 2018, the Commission issued an Order For and Notice of Evidentiary Hearing.

On September 13, 2018, Intervenors filed a Motion to Have Witnesses Appear Telephonically.

On September 14, 2018, Prevailing Wind Park filed an Answer to the Application for Party Status of Kelli Pazour. On the same day, Staff filed a Response to Late Intervention.

On September 14, 2018, Prevailing Wind Park filed a Motion to Exclude Lay Witness Testimony, to Quash Subpoenas and to Require Further Disclosures.

[2] At the evidentiary hearing, Mr. James was ruled unqualified to testify regarding health-related impacts. Portions of his pre-filed testimony were stricken accordingly and refiled on October 29, 2018 as Ex. I-1.
[3] At the evidentiary hearing, Dr. Punch was ruled unqualified to testify regarding health-related impacts. Portions of his pre-filed testimony were stricken accordingly and refiled on October 29, 2018 as Ex. I-2.
[4] Intervenors did not offer Dr. Alves-Pereira for live testimony at the evidentiary hearing and withdrew her pre-filed testimony. As such, that testimony is not part of this record.

On September 14, 2018, the Commission issued an Order For and Notice of Ad Hoc Motions Hearing.

On September 19, 2018, Staff filed a Response to Applicant's Motion to Exclude Lay Testimony, to Quash Subpoenas and to Require Further Disclosures.

On September 19, 2018, Prevailing Wind Park filed Applicant's Response to Intervenors' Motion to Have Witnesses Appear Telephonically.

On September 19, 2018, Intervenors filed Intervenors' Response to Applicant's Motion to Exclude Lay Testimony, to Quash Subpoenas and to Require Further Lay Disclosures. Included in this filing was Intervenors' First Amended Disclosure of Lay Witnesses.

On September 20, 2018, Intervenor Karen Jenkins filed a Response to Applicant's Motion to Exclude Lay Testimony, to Quash Subpoenas, and to Require Further Lay Disclosures.

On September 21, 2018, the Commission issued an Order Granting Late Party Status (Kelli Pazour).

On September 26, 2018, Intervenors filed a Subpoena for Testimony at Evidentiary Hearing to Michael Soukup.

On September 26, 2018, Intervenors filed a Subpoena for Testimony at Evidentiary Hearing to Keith Mushitz.

On September 26, 2018, Intervenor Mr. Fuerniss filed the Response of Sherman Fuerniss to Direct Testimonies.

On September 26, 2018, Prevailing Wind Park filed Applicant's Disclosure of Lay Witnesses and the pre-filed rebuttal testimony of Bridget Canty, Dr. Jeffrey Ellenbogen, Aaron Anderson, Dr. Mark Roberts, Peter Pawlowski, Michael MaRous, and Scott Creech.

On October 1, 2018, the Commission issued an Order Granting Motion for Telephonic Testimony and Order Denying Motion to Exclude Lay Testimonies and Quashing Subpoenas.

On October 1, 2018, Intervenors filed a Subpoena for Testimony at Evidentiary Hearing to Jack Soulek.

On October 1, 2018, Prevailing Wind Park filed Applicant's Witness List and Exhibit List and exhibits for hearing.

On October 1, 2018, Staff filed its Witness List and Exhibit List and exhibits for hearing.

On October 1, 2018, Intervenor Mr. Fuerniss filed his exhibits for hearing.

On October 1 and 2, 2018, Intervenors filed their Witness List and Exhibit List and exhibits for hearing.

On October 2, 2018, Intervenor Ms. Jenkins filed her exhibits for hearing.

On October 4, 2018, Prevailing Wind Park filed Applicant's Corrected Exhibit A5.

On October 4, 2018, Intervenors filed the Subpoena for Testimony at Evidentiary Hearing to Eric Elsberry. On the same day, Admissions of Service of Subpoenas were filed for Eric Elsberry and Michael Soukup. Charles Mix County Sheriff Office's Return of Service for Keith Mushitz was also filed.

On October 4, 2018, Intervenor Ms. Jenkins filed Additional Exhibits.

On October 5, 2018, Intervenors filed Intervenors' Corrected Exhibit I-16 and Exhibit I-17.

On October 5, 2018, Intervenor Mr. Fuerniss filed Additional Exhibits.

On October 9, 2018, Intervenors filed Intervenors' Opposition to Having Exhibits I-16 and I-17 be Confidential.

On October 9, 2018, Intervenors filed Exhibits I-16, I-17, I-28, I-29, and I-30.

Also on October 9, 2018, Prevailing Wind Park filed Applicant's Exhibits A3-2, A10-2, A16-R, A20-1, A20-2, A22-3, A24, A27, A28, A29, A30, A31, A32[5], and A33. Staff filed Exhibit S5.

On October 10 and 12, 2018, Prevailing Wind Park filed Exhibits A34, A35, A36, A37, A38, A39, A40, and A41. Prevailing Wind Park also filed an updated map, designated Attachment 4-2, to Intervenors' Exhibit I-29.[6] Intervenors also filed Exhibits I-31, I-32, I-33, I-34, I-35, I-36, and I-37.

The evidentiary hearing was held before the Commission on October 9-12, 2018 in Pierre, South Dakota.

On October 29, 2018, Prevailing Wind Park filed Exhibit A42, which was pre-admitted at the evidentiary hearing on October 12, 2018.

Also on October 29, 2018, in accordance with the Commission's decision regarding the striking of portions of Intervenors' Exhibits I-1 and I-2 and of the transcript from the evidentiary hearing on October 12, 2018, the hearing examiner filed the redacted versions of Intervenors' Exhibits I-1 and I-2 and the redacted transcript of the evidentiary hearing on October 12, 2018.

[5] Exhibit A32 is Applicant's and Staff's Proposed Conditions. Exhibit A33 were Applicant's Proposed Conditions relating to sound (Condition 27) and turbine flexibility (Condition 29). Applicant and Staff subsequently agreed to the turbine flexibility Condition 29 and to add meteorological towers to Condition 24, which were incorporated into Applicant's and Staff's Revised Joint Recommended Conditions attached to Applicant's brief as **Attachment A.** Applicant's Proposed Sound and Charles Mix Conditions is attached to Applicant's brief as **Attachment B**.

[6] This map is attached to Applicant's brief as **Attachment C**.

Having considered the evidence of record, applicable law, and the briefs and arguments of the parties, the Commission makes the following Findings of Fact, Conclusions of Law, and Order:

FINDINGS OF FACT

I. PROCEDURAL FINDINGS.

1. The Procedural History set forth above is hereby incorporated by reference in its entirety in these Procedural Findings. The procedural findings set forth in the Procedural History are a substantially complete and accurate description of the material documents filed in this docket and the proceedings conducted and decisions rendered by the Commission in this matter.

II. PARTIES.

2. Prevailing Wind Park, LLC is a South Dakota limited liability company and a wholly owned subsidiary of sPower Development Company, LLC ("sPower").[7]

3. sPower is an independent renewable energy company based in Salt Lake City, Utah. sPower is the largest private owner of operating solar assets in the United States. sPower owns and operates a portfolio of solar and wind assets greater than 1.3 gigawatts ("GW") and has a development pipeline of more than 10 GW.[8]

4. Intervenors Gregg and Marsha Hubner are landowners within the Project area.

5. Intervenors Paul and Lisa Schoenfelder are landowners within the Project area.

6. Intervenor Sherman Fuerniss is a landowner within the Project area.

7. Intervenor Karen Jenkins is a landowner within the Project area.

8. Intervenor Kelli Pazour resides adjacent to the Project area.

9. Staff fully participated as a party in this matter, in accordance with SDCL 49-41B-17.

III. PROJECT DESCRIPTION.

10. The proposed Project is an up to 219.6 MW wind energy conversion facility located in Hutchinson, Bon Homme, and Charles Mix counties, South Dakota. The proposed Project includes up to 61 wind turbine generators, access roads to each turbine, underground 34.5-kilovolt ("kV") electrical collection system, including an occasional aboveground junction box, connecting the turbines to the Project collector substation, underground fiber-optic cable for turbine communications co-located with the collector lines, a 34.5-kV to 115-kV collector substation, up to four permanent meteorological ("MET") towers, an operations and maintenance

[7] Ex. A1 at 1-1 (Application).
[8] Ex. A1 at 1-1 (Application).

("O&M") facility, and additional temporary construction areas, including crane paths, public road improvements, a laydown yard, and a concrete batch plant(s) (as needed).[9]

11. The Project would interconnect with Western Area Power Administration's ("WAPA's") existing Utica Junction Substation, located approximately 27 miles east of the Project. The Applicant is proposing to construct a new 115 kV gen-tie line in Bon Homme and Yankton counties from the Project collector substation to the Utica Junction Substation. The gen-tie line is not under the jurisdiction of the Commission and will be permitted in Bon Homme and Yankton counties.[10] A 115-/230-kV substation would be constructed near the point of interconnection to step up the voltage to match that of WAPA's 230 kV interconnection facilities.[11]

12. The Project is located on approximately 50,364 acres of land in Hutchinson, Charles Mix, and Bon Homme counties, South Dakota ("Project Area").[12]

13. The current estimated capital cost of the Project is approximately $297 million based on indicative construction and wind turbine pricing cost estimates. This estimate includes lease acquisition; permitting, engineering, procurement, and construction of turbines, access roads, underground electrical collector system, Project collector substation, interconnection facilities, O&M facility, supervisory control and data acquisition ("SCADA") system, and MET towers; and project financing. Capital cost estimates could fluctuate for the Project, dependent on which turbine model is ultimately used, materials and labor costs, and interconnection costs.[13]

14. Prevailing Wind Park provided evidence to support the need for turbine model flexibility.[14] The proposed turbine model that would be utilized for the Project is the GE 3.8-137, a 3.8 MW turbine with a 111.5-meter hub height and 137-meter rotor diameter ("RD").[15] For up to nine turbines, Prevailing Wind Park requested the option to use a GE 2.3 MW turbine, which has an 80-meter hub height and 116 meter RD.[16] Prevailing Wind Park demonstrated that this turbine model flexibility is necessary in case use of the smaller turbine model is required to qualify for the production tax credit.[17] Further, Prevailing Wind Park has committed to the process outlined in Condition 29 of Applicant's and Staff's Revised Joint Recommended Conditions for addressing the change in turbine model and demonstrating compliance with all of the conditions of the permit for the Project.[18]

15. All turbines will be constructed within the Project Area consistent with the configuration presented in the updated map labeled Attachment 4-2 to Applicant's Responses to

[9] Ex. A1 at 1-1 (Application); *see also* Ex. A1 at § 8.7 (Application).
[10] Ex. A1 at 1-1 (Application).
[11] Ex. A1 at 8-7 (Application).
[12] Ex. A1 at 1-1, 8-1 (Application).
[13] Ex. A1 at 7-1 (Application).
[14] *See* Ex. A1 at 8-3 (Application).
[15] Ex. A7 at 2 (Pawlowski Rebuttal).
[16] Evid. Hrg. Tr. at 209 (Pawlowski).
[17] Evid. Hrg. Tr. at 209, 254-55 (Pawlowski).
[18] Applicant's and Staff's Revised Joint Recommended Condition 29.

Intervenor's Fourth Set of Data Requests,[19] and subject to all commitments, conditions, and requirements of this Order.

16. sPower currently owns Prevailing Wind Park and is overseeing development of the Project. Prevailing Wind Park will own, manage, and operate the Project.[20]

17. Prevailing Wind Park presented evidence of consumer demand and need for the Project.[21] Prevailing Wind Park has entered into a 30-year Power Purchase Agreement ("PPA") with a South Dakota load serving entity. The output from the facility, which could annually generate up to 933,116 megawatt-hours ("MWh"), will be used to meet the needs for South Dakota residential, commercial, and industrial customers.[22] The proposed Project would provide a new source of low cost energy in South Dakota and help the country move towards the goal of energy independence, while reducing pollution and carbon emissions.[23]

18. With regard to micrositing, Prevailing Wind Park provided evidence to support the need for turbine and associated facility flexibility.[24] With respect to turbine flexibility, Prevailing Wind Park and Staff agreed to the turbine flexibility and "material change" provisions set forth in Applicant's and Staff's Revised Joint Recommended Condition 23.[25] With respect to the access roads, the collector system, O&M facility, Project substation, temporary facilities, MET towers, and other facilities, Prevailing Wind Park and Staff agreed to Condition 24 of Applicant's and Staff's Revised Joint Recommended Conditions.[26]

19. The record demonstrates that Prevailing Wind Park has made appropriate and reasonable plans for decommissioning.[27]

20. With respect to financial security for decommissioning, Staff and Prevailing Wind Park have agreed to Condition 40 of Applicant's and Staff's Revised Joint Recommended Conditions, which provides for a decommissioning escrow account.[28]

21. The record demonstrates that Prevailing Wind Park has provided adequate information on potential cumulative impacts and that the Project will not have a significant impact.[29]

[19] Attachment C to Applicant's Brief.
[20] Ex. A1 at 5-1 (Application).
[21] *See* Ex. A1 at 6-1, § 6.1 (Application).
[22] Ex. A1 at 6-1 (Application).
[23] Ex. A1 at 6-5 (Application).
[24] *See* Ex. A1 at 8-2 – 8-3 (Application).
[25] Applicant's and Staff's Revised Joint Recommended Condition 23.
[26] Applicant's and Staff's Revised Joint Recommended Condition 24.
[27] *See* Ex. A1 at Ch. 24.0 (Application); Ex. A6 at 6 (Pawlowski Supplemental Direct); Ex. A7 at 4-5 (Pawlowski Rebuttal); Ex. A11 (Pardo Supplemental Direct); Ex. A11-2 (Decommissioning Cost Analysis).
[28] Applicant's and Staff's Revised Joint Recommended Condition 40.
[29] *See, e.g.*, Ex. A1 at Ch. 22.0 (Application).

IV. FACTORS FOR AN ENERGY FACILITY PERMIT.

22. Under the SDCL 49-41B-22, the Commission must find:

> (1) The proposed facility will comply with all applicable laws and rules;
>
> (2) The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area;
>
> (3) The facility will not substantially impair the health, safety or welfare of the inhabitants; and
>
> (4) The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

23. In addition, SDCL 49-41B-25 provides that the Commission must make a finding that the construction of the facility meets all of the requirements of Chapter 49-41B.

24. There is sufficient evidence on the record for the Commission to assess the proposed Project using the criteria set forth above.

V. SATISFACTION OF REQUIREMENTS FOR ISSUANCE OF AN ENERGY FACILITY PERMIT.

A. The proposed facility will comply with all applicable laws and rules.

25. The evidence submitted by Prevailing Wind Park demonstrates that the Project will comply with applicable laws and rules.[30] Neither Staff nor Intervenors have asserted otherwise or submitted evidence to the contrary.

26. Construction of the Project meets all of the requirements of Chapter 49-41B.

B. The facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area.

1. Environment.

27. The evidence demonstrates that the Project does not pose a threat of serious injury to the environment in the Project Area and that Prevailing Wind Park has adopted reasonable avoidance and minimization measures, as well as commitments, to further limit potential

[30] *See* Ex. A7 at 2-3 (Pawlowski Rebuttal); Ex. A6 at 3 (Pawlowski Supplemental Direct); Ex. A1 at §§ 27.1, 27.4 (Application); *see also, e.g.*, Ex. A1 at 9-3, 9-4, 12-6, 15-7 (Application).

environmental impacts.[31] South Dakota Game, Fish and Parks Department ("GFP") did not identify any concerns unique to the Project.[32]

28. Construction of the Project will not result in significant impacts on geological resources. The risk of seismic activity in the vicinity of the Project Area is low according to data from the U.S. Geological Survey ("USGS").[33]

29. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to soil resources.[34] The majority of impacts will be temporary and related to construction activities.[35] Permanent impacts associated with operation of the Project will be up to 45 acres, which is less than 0.1 percent of the Project Area.[36] Prevailing Wind Park will implement various measures during construction and restoration to minimize impacts to the physical environment, including segregating topsoil and subsoil, use of erosion and sediment control during and after construction, noxious weed control, and reseeding of disturbed areas.[37]

30. The Project is not anticipated to have material impacts on existing air and water quality.[38]

31. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to hydrology.[39] The record demonstrates that Prevailing Wind Park has minimized impacts to wetlands and water bodies.[40] The Project is not anticipated to have long-term impacts on groundwater resources.[41] The Project is not anticipated to impact floodplains. There are no FEMA-mapped floodplains within the Project Area and the nearest mapped floodplains to the Project area are along Choteau Creek, over 1 mile southwest of the Project Area.[42] No turbines are located within wetlands, and Project facilities would potentially result in permanent impacts to two wetlands (0.0042 acre and 0.0002 acre of impacts, respectively) and would cross three intermittent streams (62.4 linear feet of stream segments).[43]

32. The record demonstrates that Prevailing Wind Park has minimized impacts to vegetation.[44] Permanent impacts associated with operation of the Project would be up to 45 acres (predominantly cropland and grassland/pasture), which is less than 0.1 percent of the Project Area.[45]

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[31] *See, e.g.*, Ex. A1 at Ch. 10.0, 17.0 (Application); *see also* Ex. A1 at §§ 11.1.2, 11.2.2, 12.1.2, 12.2.2, 13.1.2, 13.2.2, 13.3.2, 13.4.2, 14.3, 18.2 (Application).
[32] Ex. S1 at 8 (Kearney Direct); Evid. Hrg. Tr. at 1119 (Kearney).
[33] Ex. A1 at 11-3 (Application).
[34] *See* Ex. A1 at §§ 11.2.2 (Application).
[35] *See* Ex. A1 at 11-9 (Application).
[36] Ex. A1 at 3-2, 11-9 (Application).
[37] Ex. A1 at 11-9 – 11-10 (Application).
[38] *See* Ex. A1 at Ch. 17.0, § 18.2 (Application).
[39] *See* Ex. A1 at §§ 12.1.2, 12.2.2 (Application).
[40] *See* Ex. A1 at § 13.3.2 (Application).
[41] *See* Ex. A1 at § 12.1.2 (Application).
[42] *See* Ex. A1 at §§ 12.2.1.4, 12.2.2.3 (Application).
[43] Ex. A1 at 13-6 (Application).
[44] *See* Ex. A1 at § 13.1.2 (Application).
[45] Ex. A1 at 13-3 (Application).

33. Prevailing Wind Park coordinated with GFP to avoid and minimize impacts to potentially untilled grasslands. Based on the 2018 desktop review of potential untilled grassland areas, 1 of the 63 turbine locations is located in untilled grassland. Only approximately 1 acre of long-term Project disturbance would occur in potential untilled grasslands.[46] Permanent habitat loss due to construction of wind turbines would be minimal across the Project Area and localized.[47]

34. Prevailing Wind Park will reseed temporarily disturbed uncultivated areas with certified weed-free seed mixes to blend in with existing vegetation.[48]

35. Prevailing Wind Park has conducted numerous wildlife studies and surveys for the Project to assess existing use, identify potential impacts, and incorporate appropriate avoidance and minimization measures.[49] Prevailing Wind Park consulted with the USFWS and GFP to seek input on wildlife resources potentially occurring within the Project Area and to seek guidance on the appropriate studies to evaluate risk and inform development of impact avoidance and minimization measures for the Project.[50] Prevailing Wind Park followed the processes outlined in the USFWS Land-Based Wind Energy Guidelines ("WEG"), Eagle Conservation Plan Guidance ("ECPG"), and the SD Siting Guidelines for developing, construction, and operation of wind energy projects.[51] In addition, Prevailing Wind Park prepared a Bird and Bat Conservation Strategy ("BBCS") in accordance with the WEG, which includes strategies for mitigating risks to avian and bat species during construction and operation of the Project.[52]

36. Construction of the Project may have impacts on wildlife species primarily as a result of habitat disturbance. However, following construction, all areas of temporary disturbance will be reclaimed with vegetation consistent with the surrounding vegetation types.[53] The Project was designed to avoid and minimize displacement of wildlife by minimizing the Project's footprint in undisturbed areas.[54] Permanent habitat loss due to construction of wind turbines would be minimal across the Project Area and localized.[55]

37. The record demonstrates that, while the Project may directly impact birds and bats, avian fatalities due to the Project are anticipated to be low and to not have significant population-level impacts.[56] To prevent potential bird strikes with electric lines, collector lines will be buried underground and the Project will incorporate other avian safe practices consistent with guidelines from the Avian Power Line Interaction Committee.[57] Based on available data, bat fatalities and the degree to which bat species would be affected by the Project would be

[46] Ex. A1 at 13-4 (Application).
[47] Ex. A1 at 13-17 (Application).
[48] Ex. A1 at 3-4 (Application).
[49] *See* Ex. A1 at Table 2-1, § 13.4 (Application).
[50] *See* Ex. A1 at § 13.4 (Application).
[51] Ex. A1 at 13-7 (Application).
[52] Ex. A1 at Appendix L (Application).
[53] Ex. A1 at 13-19 (Application).
[54] Ex. A1 at 13-19 (Application).
[55] Ex. A1 at 13-17 (Application).
[56] Ex. A1 at 13-19 (Application).
[57] Ex. A1 at 13-19 (Application).

within the average range of bat mortalities found throughout the U.S.[58] The record demonstrates that the Project was designed to avoid and minimize impacts to bats. The Project Area was shifted to the north and away from the Missouri River, where more woodland habitat and higher bat populations are present. The Project has been sited in an area and designed in a manner to avoid and minimize impacts to birds and bats.[59]

38. Prevailing Wind Park conducted two years of pre-construction avian surveys.[60] Those surveys indicate that avian impacts from the Project are anticipated to be low.[61] Further, Prevailing Wind Park has committed to two years of post-construction avian mortality monitoring.[62]

39. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to federal- and State-listed species.[63] Only five federal- or State-listed threatened and/or endangered species have the potential to occur in the Project Area during some portion of the year: federally endangered interior least tern and whooping crane; and federally threatened piping plover, red knot, and northern long-eared bat.[64] The interior least tern, red knot, whooping crane, and piping plover could migrate through the Project Area during the spring and fall but are otherwise not expected to occur in the Project Area.[65] The northern long-eared bat is the only State and federally listed bat with the potential to occur within the area.[66] Impacts on federally-listed species due to Project construction and operations are anticipated to be minimal due to the low likelihood or frequency of species' presence in the Project Area and implementation of appropriate species-specific conservation measures.[67]

40. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to whooping cranes.[68] Prevailing Wind Park conducted a Whooping Crane Habitat Assessment in 2016 that included analysis of the Project Area.[69] The Project is located within an area where 10 percent or less of whooping crane migration occurs.[70] There have been no confirmed whooping crane sightings within the Project Area as of spring 2018.[71] Further, to date, no whooping crane has died as the result of a wind turbine.[72] Prevailing Wind Park will comply with applicable avoidance, minimization, and mitigation measures specified in the Upper Great Plains Wind Energy Final Programmatic Environmental Impact Statement ("PEIS"), prepared jointly by WAPA and the USFWS.[73] As part of the PEIS, Prevailing Wind Park has committed to a curtailment program whereby if a whooping crane is sighted within two miles of the Project,

[58] Ex. A1 at 13-20 (Application).
[59] *See* Ex. A1 at 13-19 – 13-21 (Application); Ex. A12 at 13 (Canty Direct).
[60] Ex. A1 at 13-14 (Application); *see also* Ex. A1 at Appendices F and G (Application).
[61] Ex. A1 at 13-19 (Application).
[62] Applicant's and Staff's Revised Joint Recommended Condition 34.
[63] *See* Ex. A1 at §§ 13.4.2.4, 14.3 (Application).
[64] Ex. A1 at 3-2 – 3-3, 13-10 – 13-12, 13-18 (Application).
[65] Ex. A1 at 3-2, § 13.4.2.1 (Application); *see also* Ex. A1 at Table 13-4 (Application).
[66] Ex. A1 at 13-16 (Application).
[67] *See* Ex. A1 at §§ 13.4.2, 14.2, 14.3 (Application); Ex. A12 at 11-13 (Canty Direct).
[68] *See* Ex. A1 at 3-2 – 3-3, 13-16, 13-18, 27-4 (Application); Evid. Hrg. Tr. at 432 (Canty).
[69] Ex. A1 at 13-16 (Application); Ex. A1 at Appendix K (Application).
[70] Evid. Hrg. Tr. at 467 (Canty).
[71] Ex. A1 at 3-2 – 3-3 (Application).
[72] Evid. Hrg. Tr. at 467-68 (Canty).
[73] Ex. A1 at 13-8 (Application).

the turbines will be shut down until the cranes leave the area.[74] There will be two ways to stop operation of the turbines. First, monitors may call the operations center and ask them to shut the turbines down. Second, each monitor will have a laptop or tablet equipped with software that will allow him or her to shut down the turbines remotely if a whooping crane is sighted.[75] This software has been successfully implemented and is used by sPower on another wind project.[76] Additionally, Prevailing Wind Park has committed to monitoring during the spring and fall migration periods.[77] Prevailing Wind Park is coordinating with USFWS regarding the specific timing of that monitoring and has also engaged a consultant to assist in that process.[78]

41. Overall, there is a low level of risk for potential bald eagle impacts at the site.[79] Prevailing Wind Park conducted eagle nest surveys in 2015 and 2016.[80] No eagle nests were identified within the Project Area, and the nearest occupied bald eagle nest to the Project Area is located approximately 0.5 miles from the current Project Area boundary. The nest is located approximately two miles from the nearest proposed turbine.[81] Prevailing Wind Park conducted an updated search through the Natural Heritage Program of known bald eagle nest sites which identified this same single active nest.[82] In addition, Prevailing Wind Park has agreed to a number of avian-related impact minimization and avoidance measures, including: conducting post-construction avian mortality monitoring for two years; and implementing the BBCS developed in accordance with the USFWS WEG to minimize impacts to avian and bat species during construction and operation of the Project.[83]

42. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to aquatic ecosystems.[84] The federally- and state-listed aquatic species with potential to occur in or near the Project are not anticipated to be affected by the Project.[85]

43. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to land use.[86] The Project will not displace existing residences or businesses.[87] Areas disturbed due to construction that would not host Project facilities would be re-vegetated with vegetation types matching the surrounding agricultural landscape. Agricultural uses may continue within the Project Area during construction and operation.[88]

[74] Evid. Hrg. Tr. at 432 (Canty).
[75] Evid. Hrg. Tr. at 1142 (Pawlowski).
[76] Evid. Hrg. Tr. at 461-62 (Canty); Evid. Hrg. Tr. at 1142 (Pawlowski).
[77] Evid. Hrg. Tr. at 432 (Canty).
[78] Evid. Hrg. Tr. at 468 (Canty).
[79] *See* Ex. A1 at 27-3 – 27-4 (Application).
[80] Ex. A1 at 2-2 (Application).
[81] Ex. A1 at 13-13, 27-3 – 27-4 (Application).
[82] Evid. Hrg. Tr. at 470-71 (Canty).
[83] *See* Ex. A12 at 13 (Canty Direct); Applicant's and Staff's Revised Joint Recommended Conditions 34 and 35.
[84] *See* Ex. A1 at § 14.3 (Application).
[85] *See* Ex. A1 at § 14.3 (Application).
[86] *See* Ex. A1 at §§ 15.1.2, 20.2.2 (Application).
[87] Ex. A1 at 15-3 (Application).
[88] Ex. A1 at 15-3 (Application).

44. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to recreation.[89] No Project facilities would be placed on USFWS Waterfowl Production Areas, GFP Game Production Areas, or GFP Walk-In Areas.[90]

45. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to conservation easements and publicly-managed lands.[91] Prevailing Wind Park coordinated with the USFWS to identify and avoid areas subject to USFWS easements within the Project Area. The Project has been designed such that no Project facilities (e.g., turbines, collector lines, access roads) would be placed on USFWS wetland or grassland easements, and thus, no direct impacts to these easement areas would occur.[92] As noted above, the Project will also avoid direct impacts to Game Production Areas and Waterfowl Production Areas.[93]

46. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to visual resources.[94] In accordance with Federal Aviation Administration ("FAA") regulations, the turbine towers would be painted off-white to reduce potential glare and minimize visual impact.[95] No scenic resources with sensitive viewsheds are located within the Project Area. The nearest scenic resources to the Project Area are located approximately 12 and 13 miles away from the Project Area. At these distances, adverse visual impacts from construction or operation of the Project are not anticipated.[96] Additionally, Prevailing Wind Park will install and use an Aircraft Detection Lighting System ("ADLS") if approved by the FAA for use for the Project, thereby reducing visual impacts.[97] Furthermore, the FAA has issued a Determination of No Hazard to Air Navigation for each of the Project's proposed turbine sites.[98]

47. Prevailing Wind Park has demonstrated that it will minimize and/or avoid impacts to cultural resources.[99] Prevailing Wind Park conducted multiple cultural resource surveys to identify cultural resources within the Project Area.[100] Prevailing Wind Park conducted a Level I Cultural Resources Records Search for the Project Area and one-mile buffer area in April 2018. Prevailing Wind Park used this information to inform the siting of Project facilities and to identify areas that have a higher likelihood for containing intact cultural resources eligible for listing on the National Register of Historic Places ("NRHP").[101] Prevailing Wind Park also completed a historical/architectural survey.[102] A draft report summarizing the results is expected by mid-November and will be submitted to the State Historic Preservation Office ("SHPO") for review and concurrence.[103] Sites determined to be NRHP-eligible will be avoided by the Project.

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[89] *See* Ex. A1 at § 15.2.2 (Application).
[90] Ex. A1 at 15-4 (Application).
[91] *See* Ex. A1 at § 15.2 (Application).
[92] Ex. A1 at 15-4 (Application).
[93] Ex. A1 at 15-4 (Application).
[94] *See* Ex. A1 at § 15.4.2 (Application).
[95] Ex. A1 at 15-13 (Application).
[96] Ex. A1 at 15-13 (Application).
[97] Ex. A6 at 5 (Pawlowski Supplemental Direct).
[98] Ex. A6 at 5 (Pawlowski Supplemental Direct).
[99] *See* Ex. A1 at § 20.5.2 (Application); Ex. A12 at 14-16 (Canty Direct); Ex. A13 at 3-43 (Canty Supplemental Direct); Ex. A14 at 2-3 (Canty Rebuttal).
[100] *See, e.g.*, Ex. A1 at § 20.5.1 (Application); Ex. A12 at 14-15 (Canty Direct).
[101] *See* Ex. A1 at § 20.5 (Application).
[102] Ex. A14 at 3 (Canty Rebuttal).
[103] Ex. A14 at 3 (Canty Rebuttal).

If avoidance is not practicable, Prevailing Wind Park will work with WAPA and SHPO to develop appropriate minimization or mitigation measures.[104] Further, Prevailing Wind Park has agreed to develop an unanticipated discovery plan for cultural resources.[105]

48. WAPA is preparing an Environmental Assessment ("EA") for the Project interconnection in accordance with the applicable requirements and standards of the National Environmental Policy Act ("NEPA"). The proposed interconnection of the Project to WAPA's transmission system is a Federal action under NEPA.[106] As part of the NEPA process for approval of the WAPA interconnection, Prevailing Wind Park is coordinating with WAPA to support WAPA's compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. WAPA is consulting with SHPO and interested tribes as part of the Section 106 compliance process.[107] Prevailing Wind Park expects that WAPA will issue the draft EA in the fall of 2018.[108]

49. Staff and Prevailing Wind Park have agreed upon Conditions 12 through 14 regarding cultural resources.[109]

2. Social and Economic.

50. Prevailing Wind Park acquired the Project in 2017 from Prevailing Winds, LLC, which was formed by a group of local investors who sought to create additional sources of income for area landowners and economic growth for the local communities through wind energy.[110] Since its October 2017 acquisition of the assets and development rights to the Project, Prevailing Wind Park has undertaken extensive development activities, consisting of landowner outreach and easement acquisition, detailed studies of resources in the Project Area, coordination with resource agencies, and design and refinement of the Project configuration.[111] Since acquiring the Project, Prevailing Wind Park negotiated additional lease agreements for approximately 40 percent of the total Project acreage.[112] Prevailing Wind Park has obtained all of the private land rights necessary to construct the Project.[113] The identification of the final Project site was primarily driven by: superior wind resources because of elevation, proximity and direct access to available transmission capacity, cost efficiency, low population density near the Project Area, and the Project's ability to avoid or minimize potential adverse environmental impacts.[114] Prevailing Wind Park also considered input from agencies and the public in siting the Project, specifically: distance from the Missouri River, where higher populations of many plant and animal species are present; distance from the Whooping Crane Migration Corridor; state and Federal lands within or near the Project Area; potentially undisturbed grasslands, wetlands, and other habitats within or near Project Area; and an existing eagle nest located near

[104] Ex. A1 at 20-14 (Application); Ex. A12 at 16 (Canty Direct).
[105] Applicant's and Staff's Revised Joint Recommended Condition 13.
[106] Ex. A12 at 7 (Canty Direct).
[107] Ex. A13 at 3 (Canty Supplemental Direct).
[108] Ex. A14 at 3 (Canty Rebuttal).
[109] Applicant's and Staff's Revised Joint Recommended Conditions 12 through 14.
[110] Ex. A1 at 2-1 (Application); Ex. A6-3 at 6 (Damon Direct); *see also* Ex. A1 at § 9.1 (Application).
[111] Ex. A1 at 2-1 (Application).
[112] Evid. Hrg. Tr. at 215, 226 (Pawlowski).
[113] Ex. A1 at 2-1 (Application).
[114] *See* Ex. A1 at § 9.1 (Application).

the Project Area.[115] The proposed configuration of Project facilities also reflects an optimal configuration to best capture wind energy within the Project Area, while avoiding impacts to residences, known cultural resources, wetlands, potentially undisturbed grasslands, and sensitive species and their habitats.[116]

51. In prior contested siting dockets, the Commission has considered the following socioeconomic issues in evaluating whether a project would pose a threat of serious injury to the social and economic condition: temporary and permanent jobs; tax revenue; and impacts on commercial, agricultural, and industrial sectors, housing, land values, labor market, health facilities, energy, sewage and water, solid waste management facilities, fire protection, law enforcement, recreational facilities, schools, transportation facilities, and other community and government facilities.[117]

52. The record demonstrates that the Project will not pose a threat of serious injury to the social and economic condition.[118] Prevailing Wind Park has demonstrated that the Project will not adversely impact property values.[119] Mr. MaRous, a South Dakota State Certified General Appraiser and a certified Member Appraisal Institute appraiser with extensive experience evaluating the impact of wind turbines on property values, conducted a Market Analysis to analyze the potential impact of the Project on the value of the surrounding properties and found no credible data indicating property values will be adversely impacted due to proximity to the Project.[120] Mr. MaRous further noted that the additional income from participating in the Project may actually increase the value and marketability of participating agricultural land.[121] This conclusion is also consistent with the Commission's recent findings regarding property values in the Crocker and Dakota Range wind farm proceedings.[122]

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[115] Ex. A1 at 9-2 (Application).
[116] Ex. A1 at 9-3 (Application).
[117] *See, e.g., In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline*, Docket HP14-002, Final Decision and Order; Notice of Entry (Dec. 14, 2015) at ¶¶ 100-101; *In the Matter of the Application by TransCanada Keystone Pipeline, LP for a Permit Under the South Dakota Energy Conversion and Transmission Facilities Act to Construct the Keystone XL Project*, Docket HP09-001, Amended Final Decision and Order; Notice of Entry (June 29, 2010) at ¶¶ 107-110 (discussing socioeconomic effects, including tax revenue, jobs, and impacts on agricultural, commercial, and industrial sectors and public facilities); *In the Matter of the Application of Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶¶ 50-57; *In the Matter of the Application of Montana-Dakota Utilities Co. and Otter Tail Power Company for a Permit to Construct the Big Stone South to Ellendale 345 kV Transmission Line*, Docket EL13-028, Final Decision and Order; Notice of Entry (Aug. 22, 2014) at ¶¶ 29-31 (discussing impacts to agriculture, property values, and local roads under this criterion).
[118] *See, e.g.*, Ex. A1 at 20-3 – 20-4, 21-1 – 21-2 (Application); Ex. A1 at §§ 20.1.2, 20.3.2 (Application); Evid. Hrg. Tr. at 257 (Pawlowski).
[119] *See* Ex. A1 at § 20.1.2.3 (Application); Ex. A15 at 8, 11, 12-13, 18-19 (MaRous Supplemental Direct); Evid Hrg. Tr. at 292 (MaRous); *see also* Ex. A15-1 (Market Impact Analysis).
[120] *See* Ex. A15 at 12, 18-19 (MaRous Supplemental Direct); *see also* Ex. A15-1 at 4-5, 55 (Market Impact Analysis).
[121] Ex. A15 at 12 (MaRous Supplemental Direct).
[122] *See In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23,

53. There is no basis in the record to require a property value guarantee. There is no record evidence that property values will be adversely affected.[123]

54. The record demonstrates that the Project will not adversely impact hunting or gaming operations in the area. Mr. Jerome Powers testified regarding his concerns about the Project's impact on his guided hunting business. However, Mr. Powers' testimony did not support his claims and there is no evidence that the Project will impact Mr. Powers' hunting operation, or hunting in general. During his testimony, Mr. Powers acknowledged that he owns approximately 12.8 acres.[124] In the past, he has relied upon year-to-year leases for hunting rights on various properties.[125] He testified that some of those landowners have decided not to renew his leases for the coming year.[126] One of those landowners – Clearfield Colony – is a participating landowner in the Project. Mr. Powers attributes that landowner's decision not to renew his hunting lease to the Project.[127] However, each landowner has the right to decide whether to enter into a hunting lease for his/her property. As acknowledged by Mr. Powers, the Project does not prohibit or otherwise restrict hunting.[128] Thus, it is Mr. Powers' ownership of limited acreage and his need to hunt on others' land that affects his hunting business and not the Project.

55. The record demonstrates that the Project will, on the whole, have positive impacts on the community.[129] Construction and operation of the Project will result in substantial benefits to South Dakota and local economies.[130] The Project will create temporary job opportunities during construction, and permanent operations and maintenance job opportunities. During construction, up to 245 temporary construction jobs are anticipated at the peak of construction, and 8 to 10 permanent jobs will also be created in the community.[131] Additionally, local businesses would also likely benefit from construction-related expenditures for the Project.[132] The Project will make lease payments to participating landowners and will provide long-term

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2018) at ¶¶ 53-54; *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) at ¶¶ 58-60; *see also* Ex. A15 at 16-19 (MaRous Supplemental Direct); Ex. A15-7 (Surrebuttal Testimony of David Lawrence in Dakota Range Docket).

[123] *See* Ex. A1 at § 20.1.2.3 (Application); Ex. A15 at 8, 12, 18-19 (MaRous Supplemental Direct); Ex. A16R at 2 (Revised MaRous Rebuttal); *see also In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) at ¶ 55; *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) at ¶ 61.

[124] Evid. Hrg. Tr. at 1017 (Powers).

[125] Evid. Hrg. Tr. at 1017, 1023-24 (Powers).

[126] Evid. Hrg. Tr. at 1024, 1028 (Powers).

[127] Evid. Hrg. Tr. at 1029-30 (Powers).

[128] Evid. Hrg. Tr. at 1018 (Powers).

[129] *See, e.g.*, Ex. A1 at § 20.1.2, 21-1 – 21-2 (Application); Ex. A1 at 6-5 – 6-6 (Application); Evid. Hrg. Tr. at 394-98 (Brandt); Evid. Hrg. Tr. at 187, 200 (Peters).

[130] *See, e.g.*, Ex. A1 at § 20.1.2 (Application).

[131] Ex. A1 at 6-1 (Application).

[132] Ex. A1 at 20-4 (Application).

benefits to the state and local tax base.[133] The Project is anticipated to result in more than $20.4 million in additional annual tax revenue for the state and local governments.[134]

56. With almost any energy infrastructure project, there is not unanimous support for the Project.[135] There are residents in the Project Area who do not support the Project, some of whom participated in these proceedings to advocate for their views. However, the opposition to this Project is similar to that for other energy infrastructure projects.[136] Moreover, while the intervenors voiced their concerns, the Commission also heard the testimony of landowners who do support the Project and they explained their reasons for participating in the Project. Participating landowners Ms. Karen Peters and Mr. Dustin Brandt testified to their good working relationships with Prevailing Wind Park and how they believe the Project will benefit the community.[137] Ms. Peters and Mr. Brandt explained their reasons for supporting the Project, including that the Project will provide an additional stable source of income for landowners, generate much-needed revenue for the counties, townships, and local schools, and create good-paying jobs in the community that will open up new career opportunities.[138] The testimony demonstrates that while people may have differences of opinion concerning the Project, it is no more than expected from an energy infrastructure project and is not anticipated to have permanent adverse impacts on the community. As Mr. Brandt and Mr. Schoenfelder testified, people may disagree about the Project, but they are, and will remain, a community and

[133] Ex. A1 at 6-5 – 6-6 (Application).

[134] Ex. A1 at 20-3 – 20-4 (Application). At the evidentiary hearing, Commissioner Hanson questioned a portion of Mr. Damon's testimony that included a calculation regarding the anticipated benefits of the Project. *See* Evid. Hrg. Tr. at 270-71. As requested by the Commissioners, in its post-hearing brief Prevailing Wind Park clarified that the excerpt in question (on page 14 of Mr. Damon's testimony) corresponds to page 20-4 of the Application, which states: "construction of the Project would create a $14.9 million boost to the local economy. Prevailing Wind Park estimates that $220,000 of food, supplies, and fuel would be purchased locally by the Project and Project staff annually (or $20.4 million over the life of the Project)." The $20.4 million total cited in Mr. Damon's testimony and the Application includes the $14.9 million *plus* the $220,000 in annual purchasing over the life of the Project. Thus, there was no calculation error in Mr. Damon's direct testimony.

[135] *See, e.g., In the Matter of the Application by Dakota Range I, LLC and Dakota Range II, LLC for a Permit of a Wind Energy Facility in Grant County and Codington County, South Dakota, for the Dakota Range Wind Project*, Docket EL18-003, Final Decision and Order Granting Permit to Construct Wind Energy Facility; Notice of Entry (July 23, 2018) (Two intervenors); *In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Final Decision and Order Granting Permit to Construct Facilities and Notice of Entry (June 12, 2018) (Two intervenors); *In the Matter of the Application of Dakota Access, LLC for an Energy Facility Permit to Construct the Dakota Access Pipeline*, Docket HP14-002, Final Decision and Order; Notice of Entry (Dec. 14, 2015) (50 intervenors); *In the Matter of the Application by TransCanada Keystone Pipeline, LP for a Permit Under the South Dakota Energy Conversion and Transmission Facilities Act to Construct the Keystone XL Project*, Docket HP09-001, Amended Final Decision and Order; Notice of Entry (June 29, 2010) (15 intervenors); *In the Matter of the Application by Buffalo Ridge II LLC, a Subsidiary of Iberdola Renewables, Inc. for an Energy Conversion Facility Permit for the Construction of the Buffalo Ridge II Wind Farm and Associated Collection Substation and Electric Interconnection System*, Docket EL08-031, Final Decision and Order; Notice of Entry (April 23, 2009) (Six Intervenors); *In the Matter of the Application of Montana-Dakota Utilities Co. and Otter Tail Power Company for a Permit to Construct the Big Stone South to Ellendale 345 kV Transmission Line*, Docket EL13-028, Final Decision and Order; Notice of Entry (Aug. 22, 2014) (three intervenors).

[136] *See* Evid. Hrg. Tr. at 257 (Pawlowski).

[137] *See* Evid. Hrg. Tr. at 185-87 (Peters); Evid. Hrg. Tr. at 394-98, 426-27 (Brandt).

[138] *See* Evid. Hrg. Tr. at 185-87 (Peters); Evid. Hrg. Tr. at 394, 396-98 (Brandt).

neighbors.[139] Many of the comments expressed by opponents of the Project relate to fears regarding potential health impacts, noise, and shadow flicker; however, as discussed in the section below, allegations of potential health effects are not supported by record evidence. Further, as discussed below, Prevailing Wind Park has addressed other concerns raised such as by proposing a reasonable and appropriate sound limit and committing to utilize turbine control software to limit shadow flicker at non-participating residences in the Project Area to no more than 30 hours per year or 30 minutes per day at non-participating residences.[140] In addition, Prevailing Wind Park is committed to continuing community outreach and dialogue in the community regarding the Project.[141]

57. The record demonstrates that the Project is not anticipated to adversely impact communications systems.[142] Prevailing Wind Park completed a study on the effects of the Project upon Federal Communications Commission ("FCC")-licensed radio frequency facilities, including analyses of microwave point-to-point paths, airports, radar stations, military aircraft operations, and National Telecommunication Information Agency ("NTIA") notification.[143] Based on the results of this study and consultation with NTIA, Prevailing Wind Park shifted a turbine 50 feet to the north to ensure avoidance of microwave beam paths.[144] In addition, Prevailing Wind Park and Staff have agreed upon Condition 25 regarding interference with communication systems.[145]

58. The record demonstrates that Prevailing Wind Park has avoided and/or minimized impacts to transportation.[146] Prevailing Wind Park will work with local units of government to obtain the necessary road crossing and utility permits for the Project.[147] Prevailing Wind Park will coordinate with applicable local road authorities to establish road use agreements, as needed, to minimize and mitigate Project impacts to haul roads.[148] The Project will participate in the South Dakota One-Call program.[149]

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[139] Evid. Hrg. Tr. at 403-04 ("It's not like there's a huge thing there. I mean, there's people for it. There's people against it. But life goes on. In the end we're all still Avon residents."); *see also id.* at 419-20 ("There is always some controversy with a project, but, as I stated before, I believe when this is all said and done, whether it is built or not, we are all still a community. I mean, these people are my neighbors. They're still going to be my neighbors when this is all said and done. So I do not believe that there's been so much [*word unclear*] that we can't get along and go about life."); Evid. Hrg. Tr. at 945-46 (Schoenfelder) ("I made a commitment early in this process that I would want to be treated the way other people want to be treated. I hope that other people feel the same way. These are my neighbors. A lot of those neighbors are taking the stands for a lot of different reasons. They're not evil people. I just – I – I refuse to – I refuse to hate anyone through this process.").

[140] *See* Applicant's Proposed Sound and Charles Mix Conditions; Applicant's and Staff's Revised Joint Recommended Condition 28; Evid. Hrg. Tr. at 42-43 (Anderson); Evid. Hrg. Tr. at 207 (Pawlowski).

[141] Evid. Hrg. Tr. at 1139-40, 1145-46 (Pawlowski); *see also* Ex. A1 at 2-1 (Application).

[142] *See* Ex. A1 at § 15.6 (Application); Ex. A14 at 5 (Canty Rebuttal).

[143] Ex. A1 at 15-15 – 15-16 (Application); *see also* Ex. A1 at Appendix O (Application).

[144] Ex. A14 at 5 (Canty Rebuttal); Evid. Hrg. Tr. at 444-45 (Canty).

[145] *See* Applicant's and Staff's Revised Joint Recommended Condition 25.

[146] *See* Ex. A1 at § 20.4.2 (Application); Ex. A6 at 4 (Pawlowski Supplemental Direct); Ex. A6-2 (Examples of FAA DNH).

[147] Ex. A6-3 at 5 (Damon Direct).

[148] Ex. A1 at 20-10 (Application).

[149] Ex. A6-3 at 14 (Damon Direct).

C. The facility will not substantially impair the health, safety or welfare of the inhabitants.

59. The record demonstrates Prevailing Wind Park has minimized impacts from noise.[150] Prevailing Wind Park has proposed Condition 27 regarding noise.[151]

60. Section 1741 of the Bon Homme County Zoning Ordinance provides: "Noise level produced by the LWES shall not exceed forty-five (45) dBA, average A-weighted sound pressure at the perimeter of occupied residences existing at the time the permit application is filed, unless a signed waiver or easement is obtained from the owner of the residence."[152]

61. Charles Mix County does not have a zoning ordinance and does not require wind energy system permits.[153] Prevailing Wind Park worked with the County to address concerns and provide assurances.[154] Prevailing Wind Park negotiated Project siting commitments with the County, which included a commitment that noise from the Project's wind turbines would not exceed 43 dBA at any existing nonparticipating residences and 45 dBA at existing participating residences, unless a signed waiver is obtained from the owner of the residence.[155] Prevailing Wind Park executed an affidavit memorializing its commitments; this affidavit binds Prevailing Wind Park but imposes no obligations on Charles Mix County.[156]

62. Hutchinson County does not have a specific sound level requirement for wind turbines in its zoning ordinance. Therefore, Prevailing Wind Park used the Bon Homme County ordinance sound level limit as a design goal for Hutchinson County.[157]

63. Prevailing Wind Park retained an independent expert to independently model the predicted sound levels for the Project.[158] The highest predicted sound level at an occupied residence is 41.9 dBA. Accordingly, all residences are expected to be below 45 dBA – in most cases, far less than 45 dBA – and therefore meet the requirements of Bon Homme County, as well as Prevailing Wind Park's commitment in Charles Mix County not to exceed 43 dBA at non-participant residences.[159]

64. The Project's sound modeling utilized conservative assumptions and was conducted in accordance with the international standard (ISO 9613-2). The modeling assumes all turbines were operating and producing maximum acoustic output, these emissions propagate out fully in all directions, and that atmospheric conditions will be relatively ideal for the

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[150] *See* Ex. A1 at § 15.3.4 (Application); Ex. A10-2 (Updated Sound Study).
[151] *See* Applicant's Proposed Sound and Charles Mix Conditions.
[152] Ex. A10-2 at 1-1 (Updated Sound Study).
[153] Ex. A1 at 15-7 (Application).
[154] Ex. A7 at 1 (Pawlowski Rebuttal); Evid. Hrg. Tr. at 217, 251, 253-54 (Pawlowski).
[155] Ex. A7 at 1 (Pawlowski Rebuttal); Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski); Evid. Hrg. Tr. at 217, 251, 254 (Pawlowski). Prevailing Wind Park also committed that shadow flicker produced by the wind turbines would not exceed 30 hours per year and/or 30 minutes per day at currently inhabited residences of nonparticipants. Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski).
[156] Evid. Hrg. Tr. at 217, 253 (Pawlowski).
[157] Ex. A1 at 15-7 (Application),
[158] Evid. Hrg. Tr. at 509 (Howell).
[159] Ex. A10 at 2 (Howell Rebuttal) and Ex. A10-1 at 2 (Memorandum Regarding Updated Modeling Results).

propagation of sound.[160] Additionally, the modeling uses a conservative ground absorption value of 0.5 and did not include attenuation for sound propagation through wooded areas, existing barriers, and shielding.[161] The model takes into account source sound power levels, air absorption, ground absorption and reflection, and terrain.[162] Prevailing Wind Park's acoustical expert Mr. Howell has verified these conservative assumptions through field measurements at other operating wind projects; thus, the methodology for modeling sound levels has been tested and confirmed in the field.[163] Mr. Howell's post-construction studies have demonstrated that his conservative pre-construction prediction methods typically exceed actual operational sound levels of proposed projects.[164] Based on the conservative nature of the sound modeling for the Project, actual sound levels for the Project are expected to be lower than the modeled levels.[165]

65. The record demonstrates that 45 dBA at non-participating residences is an appropriate and reasonable sound limit. Mr. Howell, who was retained by Prevailing Wind Park to independently model the predicted sound levels for the Project,[166] testified that this limit is one of the most restrictive sound limits he has seen and that, based on his modeling, the Project will meet these limits.[167] In his written testimony, Staff witness Mr. Hessler agreed that 45 dBA is appropriate, stating, "[i]n my experience 45 dBA is an appropriate and reasonably fair *regulatory* noise limit for wind projects at non-participating residences generally balancing the interests of [] both the community and developers."[168] At the evidentiary hearing, Mr. Hessler claimed that he would "like to see the project shoot for this 40" dBA.[169] However, Mr. Hessler continued to acknowledge that 45 dBA is "a reasonable limit under normal circumstances. When there's not a lot of opposition."[170] When asked about why he had determined there was "a lot of opposition" for this Project, Mr. Hessler referred to the time it took him to read Intervenors' submissions.[171] Mr. Hessler's perceived risk of potential future complaints is not a reasonable basis for imposing a sound limit lower than what experts agree is reasonable and appropriate. As Mr. Hessler acknowledged, it is not uncommon for there to be fear and resistance during the development phase of a project, often attributable to misinformation and highly-biased anti-wind groups, but once a project is operational, most of those fears prove to be unfounded.[172] It is also contradicted by Mr. Hessler's own testimony that there is no limit that could be set to avoid sound complaints.[173] Mr. Hessler and Intervenors' witnesses referred to the eight-turbine Shirley Wind

[160] *See* Ex. A10-2 at 17-19 (Updated Sound Study); Ex. A9 at 7 (Howell Direct); Ex. A10 at 8 (Howell Rebuttal).
[161] *See* Ex. A10 at 8 (Howell Rebuttal); Ex. A10-2 at 19 (Updated Sound Study).
[162] *See* Ex. A10-2 at 17 (Updated Sound Study); Ex. A9 at 8 (Howell Direct).
[163] Evid. Hrg. Tr. at 489 (Howell); *see also* Ex. A9 at 8 (Howell Direct) ("Our own post-construction studies have demonstrated that our pre-construction conservative prediction methods typically exceed actual operational sound levels of proposed projects."); *see also* Ex. A9 at 9 (Howell Direct) ("In-house and third-party monitoring has routinely demonstrated that our prediction methods are conservative, and monitoring results are typically between 1 and 3 dBA lower than our predictions.").
[164] *See* Ex. A9 at 8 (Howell Direct).
[165] Evid. Hrg. Tr. at 500 (Howell).
[166] Evid. Hrg. Tr. at 509 (Howell).
[167] Evid. Hrg. Tr. at 493, 509, 511 (Howell); *see also* Ex. A10 at 2 (Howell Rebuttal).
[168] Ex. S3 at 4 (Hessler Direct) (emphasis added); *see also* Ex. S3 at 7-8 (Hessler Direct) (stating that he is not aware of any wind project being designed to a 35 dBA sound limit).
[169] Evid. Hrg. Tr. at 721-22 (Hessler).
[170] Evid. Hrg. Tr. at 727 (Hessler).
[171] Evid. Hrg. Tr. at 729 (Hessler).
[172] Ex. S3 at 5 (Hessler Direct); Evid. Hrg. Tr. at 727-29 (Hessler).
[173] Evid. Hrg. Tr. at 726-27, 780 (Hessler); *see also* Ex. S3 at 4 (Hessler Direct).

Project in their testimonies as evidence regarding the potential for complaints from a wind project. However, the Wisconsin Public Service Commission was unpersuaded to implement the lower sound level for which Mr. Hessler advocated.[174] The Wisconsin Public Service Commission adopted the following requirement: "[A]n owner shall operate the wind energy system so that the noise attributable to the wind energy system does not exceed 50 dBA during daytime hours and 45 dBA during nighttime hours."[175] Thus, 45 dBA limit at non-participants' residences in Bon Homme County and Hutchinson County is consistent with prior dockets, consistent with Bon Homme County's requirements, and fully supported on the record. In Charles Mix County, based solely on Prevailing Wind Power's commitments, the appropriate sound level is 43 dBA for non-participants and 45 dBA at participant's residences unless a written waiver is obtained from the owner of the residence.

66. Section 1741 of the Bon Homme County zoning ordinance states the following: "When determined appropriate by the County, a Shadow Flicker Control System shall be installed upon all turbines which will cause a perceived shadow effect upon a habitable residential dwelling. Such system shall limit blade rotation at those times when shadow flicker exceeds thirty (30) minutes per day or thirty (30) hours per year at perceivable shadow flicker intensity as confirmed by the Zoning Administrator are probable."[176]

67. The record demonstrates that Prevailing Wind Park has minimized and/or avoided impacts from shadow flicker.[177] Consistent with industry standard, Prevailing Wind Park has committed to limiting shadow flicker at non-participating residences in the Project Area to no more than 30 hours per year at non-participating residences.[178] In addition, Prevailing Wind Park has also committed to limiting shadow flicker at non-participating residences in the Project Area to no more than 30 minutes per day.[179] Where shadow flicker exceeds the commitments made by Prevailing Wind Park, Prevailing Wind Park has committed to use Turbine Control Software programmed to automatically shut down a specific turbine or turbines for an appropriate amount of time as necessary to comply with that commitment.[180] Specifically, the software will shut a turbine down before it exceeds the committed shadow flicker limits and will not turn the turbine back on until the shadow flicker at that location has ended.[181]

68. The record demonstrates that the 30 hour/year limit is an appropriate limit that is consistent with industry standards.[182] There is no federal standard for shadow flicker exposure

[174] *See* Wisc. Admin. Code § PSC 128.14(3)(a).
[175] Wisc. Admin. Code § PSC 128.14(3)(a).
[176] Ex. A1 at 15-14 (Application).
[177] *See, e.g.*, Ex. A1 at § 15.5.2 (Application).
[178] Evid. Hrg. Tr. at 42-43, 73, 81, 83-84 (Anderson); Ex. A2 at 4 (Anderson Direct); Evid. Hrg. Tr. at 207 (Pawlowski); Applicant's and Staff's Revised Joint Recommended Condition 28.
[179] Applicant's and Staff's Revised Recommended Condition 28; Evid. Hrg. Tr. at 42-43, 73, 81 (Anderson); Evid. Hrg. Tr. at 207 (Pawlowski).
[180] Evid. Hrg. Tr. at 207-08 (Pawlowski).
[181] Evid. Hrg. Tr. at 207-08 (Pawlowski); *see also* Evid. Hrg. Tr. at 54 (Anderson) ("It's part of the machine itself, and it's simply a modification of the control software for the turbine. And we can modify that so that if the flicker above a certain threshold occurs, whether that's hours per year, minutes per day, et cetera, we can adjust the turbine control settings and, simply put, tell it not to operate or to operate in a different way.").
[182] *See* Evid. Hrg. Tr. at 51, 73, 81, 83-84 (Anderson); Evid. Hrg. Tr. at 259-60, 1114 (Pawlowski).

from wind turbines, and state and local standards are uncommon.[183] This standard is commonly applied in regulatory proceedings in other jurisdictions.[184] No jurisdictions prohibit shadow flicker at non-participating residences.[185] Staff and Prevailing Wind Park have agreed upon Conditions 28 and 29 regarding shadow flicker.[186]

69. There is no record evidence that the proposed Project will have adverse impacts on human health.[187] Construction and placement of facilities meet or exceed industry standards established for protection of the health and welfare of residences and businesses in and around the Project.[188] Further, the South Dakota Department of Health provided Staff with a letter stating that the Department of Health has not taken a formal position on the issue of wind turbines and human health.[189] The South Dakota Department of Health referenced the Massachusetts Department of Public Health and Minnesota Department of Health studies and noted that those studies generally conclude that there is insufficient evidence to establish significant risk to human health.[190]

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[183] Evid. Hrg. Tr. at 51 (Anderson).

[184] *See, e.g., In the Matter of the Application of Freeborn Wind Energy LLC for a Large Wind Energy Conversion System Site Permit for the up to 84 MW Freeborn Wind Farm in Freeborn County*, Minnesota Public Utilities Commission Docket WS-17-410, Minnesota Department of Commerce Energy Environmental Review and Analysis ("EERA") Comments and Recommendations on Draft Site Permit at 18 (December 5, 2017) (eDocket No. 201712-137950-01) ("Some of the comments indicated that non-participants should not experience more than 30 hours of shadow flicker per year. 30 hours of flicker per year was a suggested standard in a couple sources of information reviewed by EERA, but those sources do not provide supporting scientific data that would suggest there is a link between shadow flicker in excess of 30 hours per year of exposure and negative human health impacts."); *In the Matter of the Application of Lindahl Wind Project, LLC's Application for a Certificate of Site Compatibility for the Lindahl Wind Farm Project in Williams County, North Dakota*, Docket PU-15-482, North Dakota Public Service Commission Findings of Fact, Conclusions of Law and Order, (Dec. 2, 2016) at Order ¶ 8. *see also* Evid. Hrg. Tr. at 1127 (Kearney) ("Ultimately what I looked at was what the county was comfortable with as being a nuisance issue and if they were comfortable with 30 hours without some study saying that's right or wrong, I was comfortable with that.").

[185] Evid. Hrg. Tr. at 80 (Anderson).

[186] Applicant's and Staff's Revised Joint Recommended Conditions 28, 29.

[187] *See, e.g.*, Ex. A4 at 16 (Roberts Supplemental Direct) ("the levels of sound and infrasound from wind turbines are significantly lower than those that have been shown to cause harm.");; Ex. A18 at 4-5 (Ellenbogen Rebuttal) ("None of the limited epidemiological evidence reviewed suggested an association between noise from wind turbines and a wide range of topics we considered: pain, stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and/or headache/migraine. In addition, claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. . . . We did not find evidence in the human or animal literature to support that vibrations of the kind produced by a wind turbine could influence the vestibular system."); *see also* Ex. A4 at 4, 18, 21 (Roberts Supplemental Direct); Ex. A18 at 12 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 118, 171-72 (Roberts); Evid. Hrg. Tr. at 327, 375-76 (Ellenbogen).

[188] Ex. A1 at 25-1 – 25-2 (Application).

[189] Ex. S1 at 9 and DK-4 (Kearney Direct); s*ee In the Matter of the Application by Crocker Wind Farm, LLC for a Permit of a Wind Energy Facility and a 345 kV Transmission Line in Clark County, South Dakota, for Crocker Wind Farm*, Docket EL17-055, Exhibit S1 at DK-4, Letter, Kim Malsam-Rysdon, Secretary of Health, South Dakota Department of Health (Oct. 13, 2017) ("These studies generally conclude that there is insufficient evidence to establish a significant risk to human health.")..

[190] Ex. S1 at 9 and DK-4 (Kearney Direct).

70. Prevailing Wind Park offered the testimony of two highly qualified medical doctors with unchallenged credentials: Dr. Mark Roberts and Dr. Jeff Ellenbogen.[191] Dr. Roberts is a medical doctor and a PhD epidemiologist who spent 18 years working in public health with the Oklahoma State Department of Health.[192] Dr. Ellenbogen, also a medical doctor, is a Board-certified neurologist and spent five years as a professor of neurology at The Johns-Hopkins University School of Medicine.[193] Both Dr. Roberts and Dr. Ellenbogen testified that there is no scientific evidence that wind turbines cause adverse health effects.[194]

71. The testimony of Prevailing Wind Park's medical doctors was unrebutted. Intervenors did not present any expert medical testimony. While Intervenors submitted pre-filed testimony from three individuals – Mr. James, Dr. Punch, and Dr. Alves-Pereira[195] – Intervenors withdrew Dr. Alves-Pereira as a witness the day she was to testify. Mr. James and Dr. Punch were precluded from testifying regarding health effects because neither has the education, training, nor experience to provide expert testimony on health effects.[196] Neither Mr. James nor Dr. Punch is a medical doctor, nor did either perform medical evaluations on any of the people that provided complaints to them.[197] Further, neither Mr. James nor Dr. Punch provided credible literature supporting their assertions regarding health-related effects.[198] Accordingly, the Commission ordered redactions of Mr. James' and Dr. Punch's pre-filed testimony and of the transcript of their oral testimony at the evidentiary hearing to reflect the hearing examiner's ruling that neither Mr. James nor Dr. Punch is qualified to testify about health issues.[199]

72. Prevailing Wind Park's two independent medical experts, Dr. Roberts and Dr. Ellenbogen, provided extensive testimony confirming that there is no scientifically proven link

[191] The expert qualifications of Prevailing Wind Park's experts are undisputed. For example, Dr. Roberts' expert opinion was supported by citation to corroborating studies representing reliable scientific knowledge, provided as schedules to his testimony. *See, e.g.*, Ex. A4-2 through A4-8 and A5-1 through A5-11.

[192] *See* Ex. A4 at 2-3 (Roberts Supplemental Direct); Ex. A4-1 (Roberts Statement of Qualifications); Evid. Hrg. Tr. at 87-88 (Roberts).

[193] *See* Ex. A18-1(Ellenbogen Rebuttal); Ex. A18-1 (Ellenbogen Statement of Qualification); Evid. Hrg. Tr. at 318-19 (Ellenbogen).

[194] *See, e.g.*, Evid. Hrg. Tr. at 89, 92, 129, 154, 159-60 (Roberts); Ex. A4 at 4, 18, 21 (Roberts Supplemental Direct); Ex. A5 at 7-8 (Roberts Rebuttal); Evid. Hrg. Tr. at 325, 327, 360-61, 364-65, 366-67, 377-78, 382 (Ellenbogen); Ex. A18 at 4-5, 12 (Ellenbogen Rebuttal).

[195] On the day she was scheduled to appear, Intervenors withdrew Dr. Alves-Pereira as a witness. As such, her pre-filed testimony is not part of this record.

[196] *See* Evid Hrg. Tr. at 821-23 (James) and 833-35; Evid. Hrg. Tr. at 897-99, 902-03 (Punch) and 910-11, 914-15; *see also* Ex. A36 at 11 (*Williams v. Invenergy, LLC*, 2016 WL 1275990 (D. Oregon, April 28, 2016)) (holding that Mr. James "is not a doctor or epidemiologist. As a result, he does not have the training to opine that the infrasound and audible noise created by wind turbines activates physiological mechanisms in the body which produce adverse health effects"); *id.* at 14 ("Punch is neither a medical doctor nor an epidemiologist who could opine on the cause of Williams's symptoms solely on the basis of these qualifications. Therefore, for Punch's causation testimony to be admissible under *Daubert*, he must support his causation opinion with reference to foundational literature which establishes the causal relationship through the application of 'scientific knowledge.'").

[197] Evid. Hrg. Tr. at 823 (James); Evid. Hrg. Tr. at 897, 901-02 (Punch).

[198] *See* Evid. Hrg. Tr. at 825-27 (James); Evid. Hrg. Tr. at 901, 904 (Punch).For example, the paper authored by Mr. James and Dr. Punch and which both referred to in their testimony was not peer-reviewed, as that phrase is typically used. *See* Ex. A5 at 17-18 (Roberts Rebuttal).

[199] Order Redacting Exhibits and Testimonies (Nov. 1, 2018).

between wind turbines and any adverse health effect.[200] Dr. Roberts, a medical doctor and epidemiologist, analyzed and reviewed peer reviewed, published literature as well as literature generated through government process (such as a legislative committee or State Health Department) whereby the government empanels a group to review the literature and provide insight on a particular topic (known as "grey literature") and did not identify any credible scientific works that provide objective support for claims that wind turbines cause adverse health effects.[201] He concluded that there is no peer-reviewed, scientific data to support a claim that wind turbines are causing disease or specific health conditions.[202]

73. Dr. Ellenbogen, a Harvard-educated neurologist and a sleep specialist, led a Massachusetts heath impact study that concluded that wind turbines do not pose a risk to human health. Dr. Ellenbogen "specifically evaluated the merits of 'wind turbine syndrome'" and "found no basis for a set of health effects from wind turbines."[203] He also evaluated four individuals claiming to suffer from "wind turbine syndrome" and found that the claims could not be substantiated and in fact prevented the individuals from seeking appropriate treatment.[204] Dr. Ellenbogen testified: "[I]n my opinion, the misapplied blame to wind turbines prevented these individuals from seeking and obtaining much-needed medical treatment for their underlying conditions."[205]

74. There is no evidence in the record to support a finding that wind turbines cause adverse health effects.[206] This conclusion has been reached by well-respected, governmental agencies charged with protecting public health that have evaluated the available evidence and concluded that wind turbines are not a cause of adverse health effects.[207] For example, the Australian National Health and Medical Research Council concluded that there is no consistent evidence that wind turbines cause adverse health effects in humans.[208] Similarly, the Wisconsin Siting Council concluded that no association between wind turbines and health effects has been scientifically shown.[209] Researchers at the Lawrence Berkeley National Laboratory also found

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[200] *See, e.g.,* Evid. Hrg. Tr. at 89, 92, 129, 154, 159-60 (Roberts); Ex. A4 at 4, 18, 21 (Roberts Supplemental Direct); Ex. A5 at 7-8 (Roberts Rebuttal); Evid. Hrg. Tr. at 325, 327, 360-61, 364-65, 366-67, 377-78, 382 (Ellenbogen); Ex. A18 at 4-5, 12 (Ellenbogen Rebuttal).

[201] *See* Ex. A4 at 14-15 (Roberts Supplemental Direct) and Evid. Hrg. Tr. at 173-74 (Roberts). Intervenors questions Dr. Roberts about an article he authored in 2013 regarding his review of the literature available as of late 2012 on wind turbines and health effects. Evid. Hrg. Tr. at 99-100. As Dr. Roberts explained, he did not include his 2013 article as an exhibit to his prefiled testimony because he chose instead to include as exhibits the up-to-date, current reviews of the literature that have been conducted since his 2013 article. Evid. Hrg. Tr. at 174-75 (Roberts).

[202] Ex. A4 at 12 (Roberts Supplemental Direct); *see also* Ex. A4 at 15 (Roberts Supplemental Direct) ("Despite the attribution of various health events to wind turbines, there has not been a specific health condition documented in the peer-reviewed published literature to be recognized by the medical community or professional societies as a disease caused by exposure to sound levels and frequencies generated by the operation of wind turbines.").

[203] Ex. A18 at 5 (Ellenbogen Rebuttal).

[204] Ex. A18 at 7-8 (Ellenbogen Rebuttal).

[205] Ex. A18 at 8 (Ellenbogen Rebuttal).

[206] *See, e.g.,* Evid. Hrg. Tr. at 89, 92, 129, 154, 159-60 (Roberts); Ex. A4 at 4, 18, 21 (Roberts Supplemental Direct); Ex. A5 at 7-8 (Roberts Rebuttal); Evid. Hrg. Tr. at 325, 327, 360-61, 364-65, 366-67, 377-78, 382 (Ellenbogen); Ex. A18 at 4-5, 12 (Ellenbogen Rebuttal).

[207] *See* Ex. A4 at 4 (Roberts Supplemental Direct).

[208] Ex. A4 at 12-13 (Roberts Supplemental Direct).

[209] Ex. A4 at 13 (Roberts Supplemental Direct).

no link between wind turbines and adverse health effects.[210] In addition, an independent expert panel for Massachusetts (which included Dr. Ellenbogen) found that there was insufficient evidence that noise from wind farms directly causes health problems or disease.[211]

75. With respect to sleep disturbance specifically, Dr. Ellenbogen referred to a recent study from Health Canada, which found no evidence of sleep disruption from wind turbines at up to 46 dBA.[212] Specifically, the Health Canada study found that "[t]his demonstrated sensitivity, together with the observation that there was consistency between multiple measures of self-reported sleep disturbance and among some of the self-reported and actigraphy measures, lends strength to the robustness of the conclusion that [wind turbine noise] levels ***up to 46 dB(A) had no statistically significant effect on any measure of sleep quality***."[213]

76. Infrasound is generally defined as sound in the approximately 0 to 20 Hz frequency range.[214] A level of 20 Hz is commonly considered the low end of the range of human hearing.[215] Infrasound is generated by both natural and man-made sources, including: the human heart, waves, thunder, waterfalls, washing machines, fans, and heating and refrigeration systems.[216] The levels of infrasound produced by wind turbines are not only below the threshold of human hearing but are multiple orders of magnitude below the threshold.[217] There is no scientifically proven evidence of adverse effects in this level range.[218] Infrasound is not unique to wind turbines, nor is the infrasound from wind turbines unique or distinct from infrasound produced by other sources at similar levels.[219] Further, the levels of infrasound produced by wind turbines are significantly lower than those that have been shown to cause harm, such as

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[210] Ex. A4 at 13 (Roberts Supplemental Direct).
[211] Ex. A4 at 13-14 (Roberts Supplemental Direct); Ex. A18 at 4-5 (Ellenbogen Rebuttal).
[212] *See* Evid. Hrg. Tr. at 364-65 (Ellenbogen); Ex. A39 at 107 (Michaud et al., Effects of Wind Turbine Noise on Self-Reported and Objective Measures of Sleep (2016)).
[213] Ex. A39 at 107 (Michaud et al., Effects of Wind Turbine Noise on Self-Reported and Objective Measures of Sleep (2016)) (emphasis added).
[214] Ex. A4 at 17 (Roberts Supplemental Direct).
[215] Ex. A4 at 17 (Roberts Supplemental Direct). In addition, Exhibit A40 is a graphic showing the relationship between sound pressure levels (dB) and frequency (Hz) as it relates to human hearing. As indicated on the graphic, sound pressure levels must be above 100 dB for humans to hear at very low frequencies.
[216] Ex. A5 at 6-7 (Roberts Rebuttal); Ex. A4 at 17 (Roberts Supplemental Direct).
[217] Ex. A5 at 7 (Roberts Rebuttal).
[218] Ex. A5 at 7 (Roberts Rebuttal). Ex. A4 at 17 (Roberts Supplemental Direct); *see also* Evid. Hrg. Tr. at 169 (Roberts) ("If we begin to have regulations about infrasound, we're going to have to consider the other sources. Our lungs, our heart, our diaphragm, my GI tract all make low frequency sounds. My joints make low frequency sounds as well."); Evid. Hrg. Tr. at 171 (Roberts) ("Infrasound is caused by a large number of different natural and technical sources. It is every day part of our environment that can be found everywhere. Wind turbines make no considerable contribution to it. The infrasound levels generated by them lie clearly below the limits of human perception. There is no scientifically proven evidence of adverse effects in this level range.") (quoting Ex. A5-1 at 12) Intervenors referenced a study conducted on guinea pigs to argue that wind turbine infrasound could be detected and/or somehow impact the inner ear. This study is neither relevant nor helpful, as Dr. Ellenbogen explained. First, there are significant differences between the inner ears of guinea pigs and humans. Second, it has nothing to do with adverse health effects. *See* Evid. Hrg. Tr. at 386, 389-90 (Ellenbogen) ("I actually don't have confidence that the study is relevant for this panel for two reasons. One, because of the animal comparison and also because it was not about health effects. It was about perception.").
[219] *See* Evid. Hrg. Tr. at 177 (Roberts); Ex. A4 at 17 (Roberts Supplemental Direct); Ex. A5 at 6-7 (Roberts Rebuttal).

from jet engines or blast injuries.[220] There have been numerous studies analyzing wind turbine effects; none of these studies have found a causal relationship between wind turbine infrasound and human health effects.[221] As Dr. Roberts testified, these studies looked at sound overall from wind turbines when drawing their conclusions about health effects – these studies necessarily would have included infrasound.[222] Thus, there is no evidence in the record to support a finding that wind turbines cause adverse health effects.[223]

77. While there are no limits specifically addressing infrasound levels, it is well understood that limiting wind turbine noise emissions using a dBA standard automatically limits infrasound.[224] There is a fixed relationship between the dBA scale and infrasound. Thus, once one part of the spectrum is limited, the rest of the spectrum is limited as well. For this Project, the 45 dBA limit controls infrasound levels from the Project to levels that would not cause health effects and which are orders of magnitude below the human hearing threshold.[225] As Staff's witness Mr. Hessler testified, there are currently over 90,000 MW of wind power installed in the United States involving more than 50,000 wind turbines, with self-reported adverse health effect complaints at only a very small number of those turbines.[226]

78. The record demonstrates that shadow flicker from turbines is not harmful to the health of photosensitive individuals, including those with epilepsy.[227] Seizures that occur as a result of flashes of light (a condition known as photic-stimulated epilepsy) happen as a result of frequencies greater than 5 Hz, usually substantially higher.[228] The frequency of any shadow flicker from wind turbines will be approximately 0.5 to 1 Hz, which is considerably below the

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[220] Ex. A4 at 16 (Roberts Supplemental Direct); *see, e.g.*, Evid. Hrg. Tr. at 150 (describing effects of sound levels of 110-120 dB from jet engines); Evid. Hrg. Tr. at 375-76 (describing blast injuries experienced by veterans from sound pressure levels exceeding 110 dB).

[221] *See* Evid. Hrg. Tr. at 118, 135, 139-40, 160-62, 171-74 (Roberts); *see also* Ex. A5 at 7 (Roberts Rebuttal); Ex. A18 at 5 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 516-17 (Howell) ("In general the absolute values that we're talking about for this wind farm don't require any further analysis of low frequency noise, in my opinion. . . . In this scenario we looked at dBA and I did an off the cuff look at the dBC values as well and none of the values exceeded that recommended differential to determine if there's a low frequency component. So I would not expect a significant low frequency component here.").

[222] *See* Evid. Hrg. Tr. at 118, 135, 139-40, 143, 160-62, 171-74 (Roberts).

[223] *See* Ex. A5 at 7 (Roberts Rebuttal); Ex. A18 at 4-5 (Ellenbogen Rebuttal) ("None of the limited epidemiological evidence reviewed suggested an association between noise from wind turbines and a wide range of topics we considered: pain, stiffness, diabetes, high blood pressure, tinnitus, hearing impairment, cardiovascular disease, and/or headache/migraine. In addition, claims that infrasound from wind turbines directly impacts the vestibular system have not been demonstrated scientifically. . . . We did not find evidence in the human or animal literature to support that vibrations of the kind produced by a wind turbine could influence the vestibular system."); Ex. A4 at 16 (Roberts Supplemental Direct) ("the levels of sound and infrasound from wind turbines are significantly lower than those that have been shown to cause harm."); Evid. Hrg. Tr. at 118, 171-72 (Roberts); Evid. Hrg. Tr. at 327, 375-76 (Ellenbogen).

[224] *See* Evid. Hrg. Tr. at 382, 387 (Ellenbogen).

[225] Evid. Hrg. Tr. at 382, 387 (Ellenbogen).

[226] *See* Ex. S3 at 7 (Hessler) ("According to the latest quarterly report of the American Wind Energy Association there are now over 90,000 MW of installed wind power in this country involving more than 50,000 wind turbines. To my knowledge, instances of apparent adverse health effects from wind turbines have occurred at only a small handful of sites with only a few turbines each, such as Falmouth in Massachusetts (three 1.5 MW GE units) and Shirley Wind in Wisconsin (eight 2.5 MW Nordex units)."); Evid. Hrg. Tr. at 733 ("If this problem were common at all, it would be in the forefront of every project's Application and would be a totally disruptive issue.").

[227] *See* Ex. A18 at 5 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 94, 154, 159 (Roberts).

[228] Ex. A18 at 5 (Ellenbogen Rebuttal); Evid. Hrg. Tr. at 154 (Roberts).

range that would elicit a seizure even in someone who is vulnerable to seizures as a result of flashes of light.[229] No supporting scientific data has been provided to suggest that there is a link between shadow flicker in excess of 30 hours per year of exposure and negative human health impacts.

79. Overall, the record shows that Prevailing Wind Park has met its burden to demonstrate that the Project will not substantially impair human health; indeed, there is no evidence in the record that the Project would impair human health (substantially or insubstantially). Although Intervenors provided some testimony concerning speculative health concerns, the large body of reliable and vetted medical evidence refutes these claims.[230]

80. The Project will utilize an Aircraft Detection Lighting System ("ADLS") provided that the FAA approves it for the Project.[231] The FAA has issued a Determination of No Hazard to Air Navigation for each of the Project's proposed turbine sites.[232]

81. The record demonstrates that Prevailing Wind Park has taken appropriate measures to avoid and/or minimize the risk of ice throw occurring.[233] Although icing can occur on turbine blades during freezing rain conditions, the record demonstrates that it is not common and is generally controlled by ice detection systems on the turbines.[234] Project turbines will include the standard turbine control system on each turbine, as well as an additional purchased accessory software package, including Turbine Computer Monitoring ("TCM").[235] The turbine controller senses when the rotor revolutions per minute are not consistent with the measured wind speed (which may occur as the buildup of ice breaks the perfected aerodynamic shape of the blade).[236] The turbine controller then evaluates the temperature and recognizes that icing conditions may exist. The TCM system measures vibration on many components of the turbine and, when it senses vibration above pre-set levels, the turbine automatically shuts down.[237] This shut-down will occur in less than two minutes from the time icing is detected.[238] The turbine will not attempt to restart until conditions (temperature) become favorable or human intervention occurs.[239]

82. The evidence presented in the record demonstrates that Project setbacks and the proposed permit condition regarding turbine icing will protect human health and safety.[240]

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[229] Ex. A18 at 5 (Ellenbogen Rebuttal).

[230] For example, Intervenors solicited testimony from individuals regarding other wind projects (Scott Rueter, Vickie May). These witnesses clearly have strong feelings about wind projects. However, they did not provide any medical evidence of any adverse health effects and well-regarded medical research and literature – relied upon by many other regulatory bodies – refutes any claims they may be making regarding health issues and wind turbines.

[231] Ex. A6 at 5 (Pawlowski Supplemental Direct); Applicant's and Staff's Revised Joint Recommended Condition 39.

[232] Ex. A6 at 5 (Pawlowski Supplemental Direct).

[233] *See, e.g.*, Ex. A17 at 2-3 (Creech Rebuttal); Applicant's and Staff's Revised Joint Recommended Condition 38.

[234] Ex. A17 at 2 (Creech Rebuttal).

[235] Ex. A17 at 2 (Creech Rebuttal).

[236] Ex. A17 at 2 (Creech Rebuttal).

[237] Ex. A17 at 2-3 (Creech Rebuttal).

[238] Evid. Hrg. Tr. at 558 (Creech).

[239] Ex. A17 at 3 (Creech Rebuttal).

[240] *See, e.g.*, Ex. A17 at 2-5 (Creech Rebuttal); Applicant's and Staff's Revised Joint Recommended Condition 38; *see also* Evid. Hrg. Tr. at 525-256, 551 (Creech).

Prevailing Wind Park provided testimony from Mr. Scott Creech, the construction manager for the Project, who has over a decade of experience working with wind turbines.[241] Specifically, Mr. Creech testified that the farthest distance he is aware of ice being thrown from a turbine is approximately 250 feet.[242] The Project is set back at least 649.61 feet (1.1 times the tip height of the tower) from non-participating property lines.[243] In Hutchinson and Bon Homme Counties, the Project is set back at least 1,000 feet from non-participating residences. Per Prevailing Wind Park's commitments to Charles Mix County, Project turbines are set back at least 3.5 times the system height or 2,000 feet, whichever is greater, from non-participating residences in Charles Mix County.[244] The closest participating residence to a turbine is more than 1,550 feet away.[245] In addition, Prevailing Wind Park has agreed to the same turbine icing condition as the Commission imposed in the Dakota Range proceeding, which requires Prevailing Wind Park to use two methods to detect icing conditions on turbine blades.[246] Intervenors relied on an outdated article to assert that ice throw may occur as far as 6,500 feet away from a 20 MW wind turbine.[247] Such a machine is not proposed for the Project, nor does it exist. As such, the document is irrelevant. Rather, the real-world data and experience, coupled with the manufacturer recommendations and turbine control software, show that the Project as designed is appropriately sited and will minimize the potential for ice throw.[248]

D. The facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

83. The record demonstrates that the Project will not unduly interfere with the orderly development of the region. The Project complies with all applicable local land use requirements, and the evidence demonstrates that Prevailing Wind Park has worked cooperatively with local governments, even where no local land use controls existed. Specifically: Bon Homme County granted a Large Wind Energy System approval for the Project on August 21, 2018; Hutchinson County granted conditional use approvals for the Project on September 4, 2018; and, the Project received building permits from Charles Mix County in July 2018 and has worked with Charles Mix County to address concerns regarding the Project.[249] Prevailing Wind Park executed an affidavit memorializing its commitments to Charles Mix County; this affidavit binds Prevailing Wind Park but imposes no obligations on Charles Mix County.[250]

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[241] *See* Ex. A17 (Creech Rebuttal); Evid. Hrg. Tr. at 534 (Creech).
[242] Ex. A17 at 3 (Creech Rebuttal).
[243] Ex. A17 at 5 (Creech Rebuttal).
[244] Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski).
[245] Ex. A42 (Distance from Each Residence to the Nearest Wind Turbine, Modeled Shadow Flicker and Sound Pressure Levels).
[246] Ex. A17 at 4 (Creech Rebuttal).
[247] *See* Ex. A28 at 1 and Attachment B (Intervenors' Responses to Staff's Second Set of Data Requests); Evid. Hrg. Tr. at 533-34 (Creech).
[248] Ex. A17 at 2-3 (Creech Rebuttal); Evid. Hrg. Tr. at 534, 551, 554-55, 556, 558 (Creech); Ex. A31 at "Setback Considerations for Wind Turbine Siting" (Applicant's Updated Responses to Intervenors' Data Requests).
[249] Ex. A7 at 1 (Pawlowski Rebuttal).
[250] Ex. I-22 (Letter from Charles Mix County with Affidavit of Peter Pawlowski); Evid. Hrg. Tr. at 253 (Pawlowski).

84. Intervenors take issue with the development of zoning ordinances relating to the Project. As an initial matter, the local development of zoning regulations is outside the scope of the Commission's jurisdiction and is not relevant to this proceeding.[251] That said, the testimony from local officials demonstrates that those local officials listened to input from people on both sides and consulted many different resources before making their decisions.[252] Michael Soukup from the Bon Homme County Commission testified to the thorough and fair process the county undertook in adopting its wind energy system zoning ordinance; specifically, that the county looked to other zoning ordinances for guidance, and considered input from both supporters and opponents of wind energy systems in adopting its wind energy system zoning ordinance.[253] Keith Mushitz, Chairman of the Charles Mix County Commission, testified to the multiple public meetings and opportunities for public comment that were fully utilized by the public, and how the county considered all of these comments in making its decision.[254] Even Intervenor Mr. Hubner testified that he was unhappy with the outcome of such proceedings – not the process itself.[255]

85. Intervenors requested a two-mile setback from non-participating residences. There is no evidence in the record supporting a two-mile setback from nonparticipating residences.[256] The record demonstrates that the Project meets the Commission's siting requirements applying the current setbacks, as well as Prevailing Wind Park's voluntary commitments.[257] Additionally, there is no reasonable basis in the record to support a 1,500-foot setback from property lines.[258]

CONCLUSIONS OF LAW

From the foregoing Findings of Fact and the record in this proceeding, the Commission now makes the following Conclusions of Law:

1. The Commission has jurisdiction to consider the Application under South Dakota Codified Law Chapter 49-41B.

2. The wind energy conversion facility proposed by Applicant is a wind energy facility as defined under South Dakota Codified Law 49-41B-2(13).

3. The Application submitted by Applicant meets the criteria required by South Dakota Codified Law 49-41B-25, and construction of the Project meets the requirements of South Dakota Codified Law 49-41B.

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[251] Evid. Hrg. Tr. 627-28.
[252] *See* Evid. Hrg. Tr. at 685-93 (Soukup); Evid. Hrg. Tr. at 696-703 (Mushitz).
[253] *See* Evid. Hrg. Tr. at 668-69, 688-89 (Soukup).
[254] *See* Evid. Hrg. Tr. at 697-99, 703 (Mushitz).
[255] *See* Evid. Hrg. Tr. at 979 (Hubner) ("Well, I never contended their procedure. I mean, I – whether they made a mistake or didn't make a mistake as they were doing this. How they did it was really not an issue for me. It's what they did and who they listened to.").
[256] *See* Ex. A7 at 3 (Pawlowski Rebuttal); Ex. S1 at 11 (Kearney Direct).
[257] *See* Ex. A7 at 3 (Pawlowski Rebuttal); Ex. S1 at 11 (Kearney Direct).
[258] *See* Ex. A7 at 4 (Pawlowski Rebuttal); Ex. S1 at 11 (Kearney Direct).

4. The Commission satisfied the hearing and notice requirement in South Dakota Codified Law Chapter 49-41B.

5. Applicant satisfied the applicable notice requirements in South Dakota Codified Law Chapter 49-41B.

6. Applicant has demonstrated that the proposed facility will comply with all applicable laws and rules.

7. Applicant has demonstrated that the facility will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the siting area.

8. Applicant has demonstrated that the facility will not substantially impair the health, safety or welfare of the inhabitants.

9. Applicant has demonstrated that the facility will not unduly interfere with the orderly development of the region with due consideration having been given the views of governing bodies of affected local units of government.

10. All other applicable procedural requirements in South Dakota Codified Law Chapter 49-41B have been satisfied.

11. No party has provided evidence sufficient for the Commission to impose a property value guarantee.

12. No party has provided evidence sufficient for the Commission to impose a sound limit of 40 dBA on non-participating or participating residences.

13. No party has provided evidence sufficient for the Commission to impose a two-mile setback from non-participating landowners.

14. No party has provided evidence sufficient for the Commission to impose a 1,500-foot setback from property lines.

15. No party has provided evidence sufficient for the Commission to impose a condition regarding decommissioning above and beyond the condition agreed to by Staff and Prevailing Wind Park.

16. To the extent that any Finding of Fact set forth above is more appropriately a conclusion of law, that Finding of Fact is incorporated by reference as a Conclusion of Law.

ORDER

From the foregoing Findings of Fact and Conclusions of Law, it is therefore:

ORDERED, that an energy facility permit is issued to Prevailing Wind Park, LLC for the Prevailing Wind Park Project.

ORDERED, that Applicant shall comply with the attached Permit Conditions, which are hereby incorporated into and made a part of this Order.

Dated on _____ _____

65018623

PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA

IN THE MATTER OF THE APPLICATION BY PREVAILING WIND PARK, LLC, FOR A PERMIT OF A WIND ENERGY FACILITY IN BON HOMME COUNTY, CHARLES MIX COUNTY, AND HUTCHINSON COUNTY, SOUTH DAKOTA FOR THE PREVAILING WIND PARK PROJECT	* * * * * * * * *	**CERTIFICATE OF SERVICE** **EL18-026**

Alicia Jones, of Fredrikson & Byron, P.A., hereby certifies that on the 13th day of November, 2018, true and correct copies of the following documents and this Certificate of Service were e-filed via FTP and served electronically on the persons listed below:

- Prevailing Wind Park, LLC's Proposed Findings of Fact, Conclusions of Law and Order;
- Prevailing Wind Park, LLC's Post-Hearing Brief, and Attachments A-C; and
- Filing letter.

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/s/ Alicia Jones
Alicia Jones

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