

**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**

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**AMENDED
RESPONSE TO
STAFF'S FIRST SET OF DATA
REQUESTS TO INTERVENORS
EL18-026**

Below, please find my amended responses:

Below, please find my response to Staff's First Set of Data Requests to Intervenors. Thank you for allowing me the extension to submit my response by August 24, 2018, at 5:00 pm.

- 1-1) Provide copies to Staff of all data requests served on Applicant at the time of service.

I will provide this information.

- 1-2) Provide copies to Staff of all of your answers to data requests from Applicant at the time they are served on Applicant.

I will provide this information.

- 1-3) Refer to SDCL 49-41B-22. Please specify particular aspect/s of the applicant's burden that the individuals granted party status intend to personally testify on.

I am in the process of reviewing the Application to find if it is sufficient to provide for the conditions set forth SDCL 49-41B-22. I have not decided if I will testify or not.

I amend this to section to include:

I am confused about and would appreciate clarification on the process of developing this project which ultimately brought us here to the SDPUC. The developer Prevailing Winds, LLC., submitted an application to the SDPUC for 100 turbines and after the required public hearing was held, withdrew the application. The developer then split the project into 13 different projects for the purpose of selling electricity, under what I believe is related to PURPA, yet the SDPUC considered it one project during that process. After it was split up, how was it or how is it still one project? If the Commission does not have the authority or jurisdiction to determine or explain this, I ask that my question be referred to the proper authority before the Commission makes a decision on the Application.

1-4) Refer to SDCL 49-41B-25. Identify any “terms, conditions, or modifications of the construction, operation, or maintenance” that the Intervenors would recommend the Commission order. Please provide support and explanation for any recommendations. **To be clear, I recommend that the Commission deny this application. I recommend this from my experience of the Beethoven Wind Farm from permitting, construction, to the operation of it, to date.**

If the Commission will not deny the application, I recommend the condition of a 4-mile setback. My support is the fact that I live 3 miles from six Beethoven Wind Farm Industrial Wind Turbines and the height of 586 foot turbines as the Applicant has chosen is unprecedented and I believe will negatively impact my husband and myself without the 4 mile setback.

I amend this condition to:

If the Commission will not deny the application, I request a 4-mile setback from my home (not property line, my actual home) and ask that any turbines planned within 4 miles of my home be removed from the project.

A 4-mile set back, would help to diminish the cumulative effect on us, of the existing Beethoven Wind Farm and the proposed Prevailing Winds Park. The risk of negative health effects, loss of enjoyment of our property, loss of the residence to be inhabitable, and the loss of the property to be marketable may be somewhat alleviated by a 4-mile set back.

A 4-mile set back would possibly allow us to remain on our property and negate the need for us to attempt to relocate.

Additionally, of great concern to us, is the potential for future industrial wind farm projects around us. Less than a 4-mile set back will set precedence for future industrial wind farms around us that I believe are most likely in the planning stage now.

I request the ALDS which eliminates the alarming red blinking lights at night. If the FAA does not approve them, I recommend the application be denied.

The red blinking lights are meant to alarm. The red blinking lights on the Beethoven Wind Farm are a nuisance. To have an additional 57 turbines, many with the alarming red blinking lights will be result in a much bigger nuisance. The Applicant should be prevented from creating a nuisance.

I amend this to include:

I request the FAA approval of the actual use of the ALDS on this project prior to the approval of this Application or the Application be denied. If unable to obtain

FAA approval of the actual use of the ALDS on this project prior to the approval deadline of this Application, I ask the Application be denied. If the use of the ALDS on this project is in question, the project should not go forward. The cumulative effect of red blinking lights from the Beethoven Wind Farm and Prevailing Winds Park would disturb the peacefulness of the rural landscape views from within nearby residences and cause alarm. The cumulative effect of Beethoven Wind Farm and Prevailing Winds Wind Park would destroy the nighttime peacefulness of the rural landscape outside for residences nearby at night and as well as for residents and those traveling for miles and miles and miles, changing the setting from rural to industrial.

I request a Bat Detection and Shutdown System be installed on all Industrial Wind Turbines in this project. Bat fatalities negatively affect agriculture and the environment.

I withdraw my request for a Bat Detection and Shutdown System.

I request a decommissioning bond, paid for up front. Once the Industrial Wind Turbines are up, they are up. Whether or not the proposed Industrial Wind Farm will be lucrative enough to produce the income to provide for a bond in ten years is not and cannot be proven.

I request a liaison person to monitor the project as it is being built to insure compliance and an avenue for those in the footprint to voice concerns and complaints. A project of this size must have a liaison.

I request a liaison person to monitor the project from the commencing of operation through the decommissioning. I have not been able to reach anyone to assist me when I have had concerns with the existing Beethoven Wind Farm.

I withdraw my request for a liaison person to monitor the project from commencing of operation through the decommissioning.

I request there be no shadow flicker on non-participating residences, as shadow flicker presents a nuisance and the Applicant should be prevented from creating a nuisance.

I request a Guarantee of Property Value to be funded and developed by the Applicant, subject to approval of the Property Owner to protect residents in the footprint and buffer zone from financial loss should the residence become unlivable

and / or unmarketable. The Applicants project will have serious financial implications on many of the residents in the footprint and the buffer zone.

I amend this to withdraw my request for a Guarantee of Property Value.

- 1-5) Is there a specific objection (example health, blinking lights, sound) you have with respect to the Project? Please briefly explain.

I amend this section to include:

I stated in my comments at the Public Hearing for this docket in Avon, SD on July 12, 2018 that as the Commissioners consider “the views of governing bodies of affected local units of government” to please consider this: **We have not been represented properly by our local government.** When asked by Commissioner Nelson which county I was referring to I responded Bon Homme.

The Applicant makes direct reference to the Bon Homme County Zoning in the Application and is using that zoning to substantiate its fulfillment of burden of proof of the SDPUC requirement of the Applicant;

Applicant Responsibility

Applicant Responsibility The applicant that seeks the PUC’s approval must show its proposed project:

- will comply with all applicable laws and rules;
 - will not pose a threat of serious injury to the environment nor to the social or economic condition of inhabitants or expected inhabitants in the siting area;
 - will not substantially impair the health, safety or welfare of the inhabitants;
- and
- will not unduly interfere with the orderly development of the region with due consideration having been given to the views of

The Bon Homme County Zoning does not adequately protect the resident’s health, safety, and welfare and should not be considered or relied upon to establish or substantiate the Applicants required burden of proof is being met.

I amend this section to include:

I object to the Cumulative Effect of the existing Beethoven Wind Farm and the proposed Prevailing Winds Wind Park.

Cumulative Effect discussed in the Application Section 20 states:

“The Prevailing Wind Park Project, in combination with the 80-MW Beethoven Wind Project, would result in the construction and operation of up to 104 wind turbines and associated access roads, collector lines, and other facilities in Bon Homme, Hutchinson, and Charles Mix counties. The projects would result in an estimated 70 acres of cumulative ground disturbance during the life of the projects. This disturbance acreage represents less than 0.2 percent of the combined acreage of both project areas. As discussed in this Application, impacts to the physical environment, hydrologic resources, terrestrial and aquatic ecosystems, and socioeconomic and community resources have been avoided or minimized during the siting and design of the Project. Furthermore, implementation of the mitigation measures identified in this Application would minimize potential impacts of the Project on all resources. Therefore, the cumulative effects of siting the proposed Project in combination with the Beethoven Wind Project on resources within Bon Homme, Hutchinson, and Charles Mix counties are not expected to be significant.”

I am very concerned that the Commission will rely on it to use it as grounds to approve the Application as it did in the decision on Crocker EL17-055 under:

FINDINGS OF FACT

I. PROCEDURAL

“48. Crocker has demonstrated that it will minimize and/or avoid impacts to visual resources. 86 For example, consistent with the South Dakota Bat Working Group’s and GFP’s Siting Guidelines for Wind Power Projects in South Dakota for reducing impacts to visual resources, Crocker has collocated linear Project features such as access roads, crane paths, and collector and communication systems with existing disturbances to the extent practicable. 87 “

I refer specifically to this sentence:

“Due to the presence of existing wind farms in the vicinity of the Project Area, significant adverse impacts to visual resources are not anticipated.88”

Clearly, the addition of another industrial wind farm will have a negative Cumulative Effect , not only by changing the current view shed negatively for those in the footprint and the buffer zone, it will affect the view shed for miles, and miles, and miles.. It will change our visual of a rural setting to an industrial setting. This is not an insignificant change.

This project would, as planned, would introduce 57 (this is the amount of turbines to be in the project at the time of this writing) more industrial wind turbines onto what is now a beautiful rural countryside. The industrial wind turbines will be sited from twelve miles north to south on the projects eastern border, nine miles from east to west on the north and south borders, and seven miles from north to south on the western border. This Cumulative Effect will certainly negatively affect residents in three Counties. This will not be insignificant.

As for our property and home; it will all encompass the west, southwest, and south of our view shed. This will substantially impair the welfare of my husband and I by most likely causing us to try to relocate, if we could sell our home and property.

I amend this section to include:

As I witnessed with the developers of the Project, who were the same for the Beethoven Wind Farm Project, I am concerned and object to the Prevailing Winds Wind Park being another stepping stone, to infiltrate the areas surrounding our home with additional industrial wind parks thus changing our dream of rural living, that we were fortunate to realize, into a nightmare of living in one huge Industrial Wind Park or worse, of having to relocate, possibly with little means to do so.

From the Application: 23.0 FUTURE ADDITIONS AND MODIFICATIONS (ARSD 20:10:22:25) ARSD 20:10:22:25. Future additions and modifications. The applicant shall describe any plans for future modification or expansion of the proposed facility or construction of additional facilities which the applicant may wish to be approved in the permit. No future additions and modifications are anticipated. Prevailing Wind Park does request the turbine location flexibility and other facility flexibility specified in Section 8.1.

The Project was being planned as early as or earlier than the year 2014. I am concerned a third phase is being planned.

The nuisance of red blinking lights as mentioned above in section 1-4. If the FAA will not approve the use of the ALDS the application should be denied.

Most concerning is sound, both audible and infrasound. There are many complaints about both audible and inaudible noise from Industrial Wind Turbines, they are well documented. The result of negative health effects to some residents from both audible and inaudible noise is also well documented.

I amend this to include LFN and sound pressure.

Health, again the size of the Industrial Wind Turbines the Applicant has chosen is unprecedented. The area and range they will impact is unknown and will likely cause the loss of enjoyment of property, loss of use of property, loss of the residence to be inhabitable, and the marketability of property will be greatly diminished.

What, if anything, do you feel could be done to remedy that issue?

Deny the Application.

If the Commissioners will not deny the application, the Commission must then approve the Application with conditions that will truly protect the health, safety, and welfare of all of the residents living in and near the footprint.

I amend this to emphasize: truly protect the health, safety, and welfare of all of the residents living in and near the footprint. While I have specific experience of living near Beethoven Wind Farm I have asked for the set -back I believe to be a minimum to satisfy our particular situation. I am not prepared to recommend an appropriate set back of others, although I would not recommend anything closer than 4 miles.

Sound should not exceed 35 decibels for non-participating residences.

I amend this to sound should not exceed 35 dB A for non-participating residences and participating residences.

Setbacks should be 4-miles from a non-participating residence.

I amend this to request a 4 mile setback from our residence (not our property

line, specifically our home) and I request that any turbines located within 4 miles from our home be removed from the project plans.

While I have specific experience of living near Beethoven Wind Farm I have asked for the setback I believe to be a minimum to satisfy our particular situation.

An ALDS must be installed. If the FAA does not approve an ALDS the application should be denied.

I amend this to include: I request the FAA approval of the actual use of the ALDS on this project prior to the approval of this Application or the Application be denied. If unable to obtain FAA approval of the actual use of the ALDS on this project prior to the approval deadline of this Application, I ask the Application be denied.

Please list with specificity the witnesses the Intervenors intend to call. Please include name, address, phone number, credentials and area of expertise.

I am still reviewing the Application and have not decided if I will call witnesses.

I amend this to:

I reserve the right to call witnesses or testify on behalf of myself during this hearing.

1-6) Do the you intend to take depositions? If so, of whom? Not at this time.

I amend this to I do not intend to take depositions.

Dated this 1st day of October, 2018

Karen Jenkins
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Tripp, SD 57376
605-680-5646
Jenkinskd55@gmail.com

WIND TURBINE NOISE 2013 PROVISIONAL PROGRAMME

Tuesday 27 August 2013

13.00 – 17.00 Short Course on Noise

15.00 – 19.00 Registration

17.30 – 19.30 Exposition Reception (Joint with Noise-Con 2013)

Wednesday 28 August 2013

08.00 – 09.30 Plenary Lecture (Joint with Noise-Con 2013)

Wind Turbines: What's all the noise about? An American retrospective and prognostication

Mark Bastasch, USA

Low Frequency Noise and IS: Measurements

09.45 Infrasound measurement, interpretation and misinterpretation

Bruce Walker, USA

10.00 Measuring and analyzing wind turbine infrasound and audible immissions at a site experiencing adverse community response

George Hessler, USA

10.15 The measurement of infrasound and low frequency noise for wind farms

Steven Cooper, Australia

10.30 – 10.45 Discussion

10.45 – 11.15 Coffee Break

Low Frequency Noise and IS: Effects

11.15 Infrasound and the ear

Geoff Leventhall, UK

11.30 A proposed theory to explain some adverse physiological effects of the infrasonic emissions at some wind farm sites

Paul D. Schomer et al, USA

11.45 Perception of low frequency components contained in wind turbine noise

Sakae Yokoyama, Shinichi Sakamoto and Hideki Tachibana, Japan

12.00 – 12.15 Discussion

12.15 – 13.30 Lunch

Amplitude Modulation

13.30 Amplitude modulation and complaints about wind turbine noise

Joachim Gabriel et al, Germany

13.45 Audible amplitude modulation - results of field measurements and investigations compared to psycho-acoustical assessment and theoretical research

Mike Stigwood, Sarah Large and Duncan Stigwood, UK

14.00 Amplitude modulation noise analysis and first look at off-shore wind turbine aeroacoustics simulation study

Sidney Xue et al, China

14.15 Thump noise prediction

Rufin Makarewicz, Poland

14.30 Application of phased array techniques for amplitude modulation mitigation

Steven Buck, Scott Palo and Patrick Moriarty, USA

14.45 – 15.15 Discussion

15.15 – 15.45 Coffee Break

Transducers Instrumentation

15.45 Evaluation of secondary windshield designs for outdoor measurement of low frequency noise and infrasound

Kristy Hansen, Branko Zajamek and Colin Hansen, Australia

16.00 Improvement of regression analysis on wind noise effects for low frequency sound measuring in natural wind

Noboru Kamiakito et al, Japan

- 16.15 How frequency response influences measurement and audibility of periodic wind turbine sound
Werner Richarz, USA and Harrison Richarz, UK
- 16.30 Wind turbine noise measurements in practice
Carsten Thomsen and Simon Møller Nielsen, Denmark
- 16.45 Highly distributed data acquisition on wind turbines with PAK
Dejan Arsic and John Huff, Germany
- 17.00 – 17.30 *Discussion*

**Thursday 29 August 2013
Session Room A**

Aerodynamic Noise Generation and Control

- 08.00 Review of NACA 0012 turbulent trailing edge noise data at zero angle of attack
Con Doolan and Danielle Moreau, Australia
- 08.15 Wind turbine noise modelling based on Amiet's Theory
Y. Tian, B. Cotté and A. Chaigne, France
- 08.30 Broadband noise prediction of small horizontal wind turbine rotor
Bavuudorj Ovgor and Seungbae Lee, Republic of Korea
- 08.45 Hybrid methods for noise prediction in aeroacoustic simulations of small vertical axis wind turbines
Johannes Weber et al, Germany and Austria
- 09.00 Wake patterns and noise in a dual rotor wind turbine
K. Asfar and A. Mahasneh, Jordan
- 09.15 The effect on noise emission from wind turbine due to ice accretion on rotor blades
Peter Arbinge and Paul Appelqvist, Sweden
- 09.30 Noise prediction of wind turbine and low noise blade design
Kentaro Hayashi et al, Japan
- 09.45 Aeroacoustic noise mitigation investigation for wind turbine blades
Michael Asheim, Patrick Moriarty and David Munoz, USA
- 10.00 – 10.30 *Discussion*
- 10.30 – 11.00 *Coffee Break*

Structureborne Noise/Vibration

- 11.00 Noise from one stage of helical gears by wind turbine load
Chan IL Park, Republic of Korea
- 11.15 A validated virtual prototyping approach for avoiding wind turbine tonality
Goris Sonja et al, Belgium and Germany
- 11.30 Suppression of the structure-borne sound from a wind turbine generator using active vibration control devices: model experiment
Tetsuya Miyazaki et al, Japan
- 11.45 – 12.00 *Discussion*

Source Identification

- 12.00 Noise source localization on a 8kW wind turbine using a compact microphone array with advanced beamforming algorithm
Rakesh Chandran Ramachandran et al, USA
- 12.15 Acoustic array design for wind turbine noise measurements
Steven Buck et al, USA
- 12.30 Identification of wind turbine noise through signal analysis
Michael Medal et al, Canada
- 12.45 – 13.00 *Discussion*
- 13.00 – 13.45 *Lunch*

Session Room B

Effects of WTN on Individuals

- 08.00 Audit report: Literature reviews on wind turbine noise and health
Brett Horner, Carmen Krogh and Roy Jeffrey, Canada
- 08.15 Wind turbine noise: What has the science told us?
Loren D. Knopper et al, Canada
- 08.30 Perception change of soundscape as wind turbine alters community sound profile
William K.G. Palmer, Canada
- 08.45 Trading off human health: Wind turbine noise and government policy
Carmen Krogh et al, Canada
- 09.00 Wind turbine facilities' perception: a case study from Canada
Peter N. Cole and Carmen Krogh, Canada
- 09.15 Correlation between people perception of noise from large wind turbines and measured noise levels
Federica Andreucci et al, Italy Enrico Mazzocchi will give this paper.
- 09.30 Masking of sage-grouse display calls by noise from wind turbines
Scott Noel, USA
- 09.45 – 10.15 *Discussion*
- 10.15 – 10.45 *Coffee Break*

Sound Immission Measurements Part 1

- 10.45 Noise's measure inside homes generated by the functioning of wind farm in southern Italy
Amelia Trematerra and Gino Iannace, Italy
- 11.00 Hiding wind farm noise in ambient measurements - noise floor, wind direction and frequency limitations
Steven Cooper, Australia
- 11.15 Tonality assessment at a residence near a wind farm
Jonathan Cooper, Tom Evans and Dick Petersen, Australia
- 11.30 Evaluation of wind turbine-related noise in western New York State
Martin T. Schiff et al, USA
- 11.45 The variability factor in wind turbine noise
Jim Cummings, USA
- 12.00 Annoyance from wind turbine noise – what can we learn from different assessment methods?
Sabine von Hünenbein, UK
- 12.15 – 12.45 *Discussion*
- 12.45 – 13.45 *Lunch*

Sound Immission Measurements Part 2

- 13.45 Simultaneous indoor low-frequency noise, annoyance and direction of arrival monitoring
Branko Zajamsek et al, Australia
- 14.00 Generating a better picture of noise immissions in post construction monitoring using statistical analysis
Payam Ashtiani, Canada
- 14.15 Wind farm noise commissioning methods: A review of methods based on measuring at receiver locations
Christophe Delaire et al, Australia
- 14.30 Assessment of wind turbine noise in immission areas
Hideki Tachibana, Hiroo Yano and Akinori Fukushima, Japan
- 14.45 – 15.15 *Discussion*
- 15.15 – 15.45 *Coffee Break*

Sound Emission Measurements

- 15.45 Wind turbine noise measurements - how are results influenced by different methods of deriving wind speed?
Sylvia Broneske, UK
- 16.00 RoBin: Meeting the requirements of the IEC 61400-11 standard for measuring the acoustic emission of wind turbines with a one-man operated system
D. Vaucher De La Croix, France and T. Klaas, Germany
- 16.15 Tonality in wind turbine noise. IEC 61400-11 ver. 2.1 and 3.0 and the Danish/Joint Nordic method compared with listening tests
Lars Sommer Søndergaard and Torben Holm Pedersen, Denmark
- 16.30 The production of a good practice guide to assess wind turbine noise in the United Kingdom using ETSU-R-97
Richard Perkins et al, UK
- 17.00 – 17.30 *Discussion*
- 19.00 – 22.30 *Reception and Banquet at Denver Art Museum*

Friday 30 August 2013

Propagation Wind Effects Modelling Part 1

- 08.30 Sound propagation from wind turbines under various weather conditions
Olof Öhlund and Conny Larsson, Sweden
- 08.45 Proposed method for characterizing wind turbine noise and their dependence on meteorological effects for validation of existing studies
David S. Woolworth, Roger Waxler and Jeremy Webster, USA
- 09.00 Wind farm layout optimization in noise constrained areas
Andrew Brunskill, Canada
- 09.15 Validation of WindPRO implementation of Nord2000 for low frequency wind turbine noise
Lars Sommer Søndergaard and Thomas Sørensen, Denmark
- 09.30 Environmental noise assessment of proposed wind farms using annual average Ldn
Mark Bliss, Canada
- 09.45 – 10.00 *Discussion*
10.00 – 10.30 *Coffee Break*

Propagation Wind Effects Modelling Part 2

- 10.30 Accuracy of noise predictions for wind farms
Jonathan Cooper and Tom Evans, Australia
- 10.45 Large-scale calculation of possible locations for specific wind turbines under consideration of noise limits
Fabian Probst, Wolfgang Probst and Bernd Huber, Germany
- 11.00 The new good-practice-guide to help assessment of wind turbine noise in Finland
Denis Siponen et al, Finland
- 11.15 Physics based spatial acoustics in virtual scenes with application to wind farm noise
Kevin Nelson and Steven G. Mattson, USA
- 11.30 – 11.45 *Discussion*
11.45 – 13.00 *Lunch*

Regulations & Policies Part 1

- 13.00 Which limits for wind turbine noise? A comparison with other types of sources using a common metric
Gaetano Licitra and Luca Fredianelli, Italy
- 13.15 International legislation and regulations for wind turbine noise
Kevin Fowler, USA, Erik Koppen, The Netherlands and Kyle Matthis, USA
- 13.30 New environmental regulation for wind turbines in Flanders (Belgium)
Arjan Goemé, Belgium
- 13.45 Danish regulation of low frequency noise from wind turbines
Jørgen Jakobsen and Jesper Mogensen, Denmark
- 14.00 Low frequency noise from wind turbines: Do the Danish regulations have any impact?
Bo Søndergaard, Denmark
- 14.15 – 14.30 *Discussion*
14.30 – 15.00 *Coffee Break*

Regulations & Policies Part 2

- 15.00 Low frequency noise proposed wind farm in Maastricht, The Netherlands
Erik Koppen, The Netherlands
- 15.15 How does noise influence the design of a wind farm?
Matthew Cassidy, Alden D'Souza and Jeremy Bass, UK
- 15.30 Wind power development trends in Denmark: Targets, legislation and social acceptance
Karina Lindvig, Denmark
- 15.45 Projected contributions of future wind farm development to community noise and annoyance levels in Ontario, Canada
Melissa L. Whitfield Aslund, Christopher A. Ollson and Loren D. Knopper, Canada
- 16.00 State of wind turbine developments in northeastern USA – 2013
James D. Barnes, Marc S. Newmark and Bill Yoder, USA
- 16.15 Recent developments in wind farm noise in Australia
Chris Turnbull and Jason Turner, Australia
- 16.30 – 17.00 *Discussion*
17.00 – 17.15 *Closing Ceremony*

Siting Guidelines for Wind Power Projects in South Dakota



Introduction

The South Dakota Bat Working Group in cooperation with the Department of South Dakota Game, Fish and Parks compiled these siting guidelines for wind power developers and other stakeholders to utilize as they consider potential wind power sites in South Dakota. Wind power siting and permitting processes vary by county and/or city. The Public Utilities Commission has agreed to distribute siting guidelines to all stakeholders involved in the development of wind power in South Dakota, since at this time no state environmental regulations exist in association with siting of wind turbines.

Wind siting guidelines relevant to South Dakota were adapted from the National Wind Coordinating Committee's (NWCC) Permitting of Wind Energy Facilities: A Handbook and the Kansas Renewable Energy Working Group (KREWG) Environmental and Siting Committee's Siting Guidelines for Windpower Projects in Kansas. The National Wind Coordinating Committee's guidelines are available online at the following website address: <http://www.nationalwind.org/publications/siting.htm> and the Kansas Renewable Energy Working Group's guidelines are available online at the following address: <http://www.kansasenergy.org/krewg/reports/KREWGSitingGuidelines.pdf>.

South Dakota's guidelines address activities and concerns associated with siting and permitting wind turbines. Successfully siting a wind power project often relies on trade-offs between community acceptability and economic viability, which relates to adequate communication.

Although wind power is considered "green energy," many concerns have been expressed about the effects of their presence on plants and animals native to South Dakota. Specific areas of South Dakota have been identified as potential sites for wind energy development, and these sites are located in, but not limited to, the Coteau des Prairies in eastern South Dakota and the Missouri River in central South Dakota, which are unique/rare in South Dakota. Additional areas in other regions of the state may be identified/added by ongoing studies or further infrastructure development (e.g., transmission lines and substations).

Wind energy issues in South Dakota are similar to those in other states. Most residents of South Dakota respect their local resources, wildlife, and environment, and have concerns regarding the exploitation and/or degradation of those resources. Developers, recognizing the opportunity to establish renewable energy generation facilities, may not be aware of concerns expressed by agencies, groups, or individuals regarding wind farm impacts. Each project should be evaluated on a case by case basis. Cumulative impacts will undoubtedly accrue as development proceeds within regions (e.g., Missouri River, Coteau des Prairies, Prairie Pothole) and across the state. These

cumulative effects may differ in type and significance from those experienced at individual project sites. In particular, the cumulative effects on natural and biological resources, such as habitat (e.g., native prairie) and wildlife (e.g., birds and bats), require consideration from all stakeholders; however, impacts on other resources are also important. For further development and sustainability of the wind energy industry, it is important by all stakeholders to evaluate the context of the collective merits of all projects.

Most guidelines within this document are issues and concerns identified by other parties, e.g., NWCC and KREWG, which are shared in South Dakota, but some guidelines are tailored to address the concerns and issues specifically to this state. These guidelines address issues/concerns associated with the pre-construction, construction or post-construction of wind turbines and have been divided into eleven general categories:

- 1) Land Use
- 2) Natural and Biological Resources
- 3) Noise
- 4) Visual Resources
- 5) Public Interaction
- 6) Soil Erosion and/or Water Quality
- 7) Health and Safety
- 8) Cultural, Archaeological, and Paleontological Resources
- 9) Socioeconomic, Public Service, and Infrastructure
- 10) Solid and Hazardous Wastes
- 11) Air Quality and Climate.

The guidelines outlined in this document are neither mandates nor regulations. They have been compiled/developed: 1) to encourage developers to select potential wind sites using a process that is acceptable to all stakeholders (e.g., state agencies/departments, federal agencies, sportsmen/women groups, local communities, developers, landowners, wildlife advocacy groups, and/or tribal agencies); 2) to protect South Dakota rare/unique areas (e.g., Coteau des Prairies, Missouri River, and Prairie Potholes) and thus the state's natural beauty; 3) to minimize deleterious effects to wildlife; 4) to help provide information to all involved/interested parties; and 5) to promote a responsible, guided, uniform approach to the siting of wind power projects in South Dakota.

- 1) Land Use - Wind development may be compatible with a variety of other land uses, including agriculture, grazing, open space, and habitat conservation, depending on the site, size, and design of the project. Other land uses, such as hunting/fishing, bird watching, and wildlife photography as well as resource values need to be considered when siting large wind projects in remote areas of South Dakota. Stakeholders need to understand all the land use issues associated with a site before finalizing development plans, permit conditions, or other requirements.
 - a) Contact resource agencies (Table 1), property-owners and other stakeholders early to identify potentially sensitive land uses and issues. Ensure that all the stakeholders fully understand the entire project in order to address and resolve potential land use issues.
 - b) Look at all the land use relationships and objectives for an entire wind resource area. Land use concerns are specific to different regions of South Dakota thus early scoping and planning is crucial to reducing potentially incompatible uses. Contact appropriate experts (Table 2) and resource agencies to research and evaluate the issues prior to selecting a specific site within the respective region.
 - c) Careful consideration should be given to the impact of wind power projects in areas that are unique/rare in South Dakota, such as the Missouri and Prairie coteaus (Figure 1), the Prairie Pothole region and the Missouri River. Special care should be given to avoid damage to unfragmented landscapes and high quality remnants in wetland and prairie ecosystems (e.g., tall grass, mixed grass, and short grass prairie). If possible, wind energy development should be located on already altered landscapes, such as cultivated or developed lands. An undeveloped buffer adjacent to intact prairies is also desirable.
 - d) Consider the potential impacts of both wind and non-wind (e.g., roads, transmission lines, substations) project development in the wind resource area before development projects are proposed, and develop a plan for the area that avoids or minimizes land use conflicts. Design the project site layout to limit the use of the land, consolidate necessary infrastructure requirements wherever possible, and evaluate current transmission lines and market access.
 - e) Learn the rules that govern where and how a wind project may be developed in the project area. Become aware of potential conflicts between lease provisions and permitting agency (e.g., The Public Utilities Commission and/or local governments) conditions for project development.

- 2) Natural and Biological Resources - Bird and bat collision mortality and behavioral avoidance associated with wind energy facilities have been a controversial siting consideration. Typically, bats have a higher incidence of mortalities at wind energy sites than birds, though this depends on the site. Biological resource surveys at each potential wind power site in the early stages of planning can help determine whether serious conflicts are likely to occur at a particular site, but cumulative effects with multiple sites in a particular region/area must also be acknowledged and/or investigated and minimized/avoided. In some instances, the impact wind turbines have on birds, bats, and other sensitive biological resources can be adequately mitigated. However, wind development may be inappropriate in certain areas in South Dakota.
- a) Consider the biological setting early in project evaluation and planning. Use biological and environmental experts to conduct a preliminary biological reconnaissance of the likely site area. Communicate with personnel from wildlife agencies (e.g., South Dakota Game, Fish and Parks (SDGFP), U. S. Fish and Wildlife Service, U. S. Geological Survey, and Natural Resources Conservation Service; Table 1) and universities (e.g., South Dakota State University, University of South Dakota, Dakota State University, Black Hills State University, and Northern State University; Table 2). If a proposed turbine site has a large potential for biological conflicts and an alternate site is eventually deemed appropriate, the time and expense of detailed wind resource evaluation work may be lost.
 - b) Contact the local resource management agency (e.g., local South Dakota Conservation District and SDGFP regional office, Appendix A) early in the planning process to determine if there are any resources of special concern in the area under consideration.
 - c) Involve local environmental/natural resources groups (e.g., South Dakota Wildlife Federation, local chapters of Audubon Society, local chapters of The Wildlife Society, Izaak Walton League, The Nature Conservancy, South Dakota Bat Working Group, Ducks Unlimited, United Sportsmen for South Dakotans; Table 3) as soon as practicable. Early involvement of these organizations may provide additional resource information as well as minimize potential conflicts.
 - d) Avoid unnecessary ecological impacts of wind power development through proper planning. Examine landscape levels of key wildlife habitats, migration corridors, staging/concentration area, and breeding/brood-rearing areas to help develop general siting strategies. Situate turbines so they do not interfere with important wildlife movement corridors and staging areas.

- e) Avoid large, intact areas of native vegetation. Sites where native vegetation is scarce or absent will have substantially fewer biological resource concerns.
- f) Careful review should be given to sites with legally protected wildlife (e.g., state or federal threatened or endangered species, migratory birds) present or potentially present. Recognize that other declining or vulnerable species (not legally protected) may also be present. Investigate wildlife issues associated with each potential wind energy site and determine the apparent impacts of each potential wind energy site on species of concern.
- g) Avoid lattice-designed towers or other designs providing perches for avian predators. Avoid placing perches of any sort on the nacelles of turbines. Address potential adverse affects of turbine warning lights on migrating birds and bats. Minimize effects of meteorological towers when investigating wind energy potential by using tubular monopoles rather than lattice structures with guy wires and lighting systems, which could represent a hazard to birds.
- h) Bury power lines and/or place turbines near existing transmission lines and substations, where possible. Infrastructure should be able to withstand periodic burning of vegetation, where prescribed burns are practiced. Minimize number of roads and fences.
- i) Mitigate for habitat loss in areas where there is ecological damage in the siting of a wind power facility. Appropriate actions include but are not limited to ecological restoration, long-term management agreements, conservation easements, or fee title acquisitions to protect lands with similar or higher ecological quality as that of the wind power site.
- j) Consider possible cumulative regional impacts from multiple wind energy projects when conducting environmental assessments and making mitigation decisions. Evaluation of these impacts could result in significant changes to project plans.
- k) Consider turbine designs (e.g., wind turbines with tubular monopoles rather than lattice structures with guy wires) or deterrents, which minimize potential impacts on flying animals such as birds and bats.
- l) Consider timing of construction and maintenance activities (including mowing) to minimize impacts on native flora (plants) and fauna (animals), including ground-nesting birds. Avoid construction and maintenance activities during breeding season (April to July) and, if possible, during migration (April – June and August – October).

- m) Develop a stringent plan for preventing the introduction or establishment of non-native/invasive flora (plants) in disturbed areas and establishing the financial means to do so the duration of the wind power project.
- 3) Noise - Noise emitted by wind turbines tends to be masked by the ambient (background) noise from the wind itself and tends to fall off sharply with increased distance, therefore noise-related concerns are likely to occur at residences closest to the site, particularly those sheltered from prevailing winds. Advanced turbine technology and preventive maintenance can help minimize noise during project operation.
- a) Design projects with adequate setbacks from dwelling units, especially where the dwelling unit is in a relatively less windy or quieter location than the turbine(s). Recognize that residents who object to noise created by wind energy may replace residents who support wind systems. Efforts should be made to place the turbines in disturbed areas (e.g., croplands) as stated above.
 - b) Avoid locating marginally noisy turbines in projects with nearby residences. In areas potentially sensitive to acoustic levels, e.g., nearby residences or natural surroundings, consider taking efforts to prevent problems by upgrading turbines with sound reduction technology.
- 4) Visual Resources - There are ways to reduce the visual impact of wind projects, but there may be tradeoffs to consider. One of the best tools for assessing project impact is the use of visual simulations.
- a) Consider visual impact of wind power projects when siting turbines. Evaluate the impact of siting turbines on the quality of the surrounding landscape, especially in areas where aesthetic qualities and/or neighboring properties might be affected. Prepare and use visual simulations and/or viewshed analyses to provide information to landowners, the general public, and other key stakeholders to identify potential impacts to visual resources from wind power developments.
 - b) Educate all stakeholders about what to expect from a wind project.
 - c) Prepare to make impact tradeoffs and coordinate planning efforts in all jurisdictions and with all stakeholders.
 - d) Listen to the communities and stakeholders in all project phases and be prepared to adapt design to minimize industrial characteristics and structures and minimize visual exposure from sensitive areas.
 - e) Minimize the need for developed roads or cut and fill techniques. Consider possibilities and benefits of using roadless project designs or designs relying on current roads, especially in remote or sensitive visual areas.

- f) Identify designated scenic byways and popular landscapes and avoid siting turbines in areas that are readily visible from those sites. Priority should be given to wind power projects in sites where the natural landscape has already experienced significant change from human-related causes.
- 5) Public Interaction - It is important to inform all stakeholders of the benefits and tradeoffs associated with each wind power project, therefore wind projects entail public involvement. This makes it easier for all stakeholders to communicate and cooperative with each other in order to make informed decisions in the best interest of all parties.
- a) Prepare and implement a public education program to discuss the benefits and tradeoffs involved in wind generation.
 - b) Provide objective information or access to objective information that allows interested parties to make informed decisions. Decision making by all stakeholders is enhanced through accurate and comprehensive information sharing and opportunities for communication between stakeholders. Invite public input in regards to wind power projects through public meetings and public forums.
- 6) Soil Erosion and/or Water Quality - Temporary and permanent soil disturbance results from wind projects. Care must be taken to estimate and control both runoff and erosion from each wind power site, particularly in areas where access roads and facilities are located in steep terrain, especially near waterways (e.g., creeks and rivers) and wetlands.
- a) Minimize the footprint of the project and evaluate alternative turbine pad and access road siting and layouts. Minimize improved roads and construction staging areas and avoid sensitive habitats (e.g., native prairies and wetlands).
 - b) Preferably conduct construction and maintenance of wind power sites when the ground is frozen or when soils are dry and the native vegetation is dormant. Conduct ongoing operation and maintenance activities, as practical, by using light conveyances in order to minimize habitat disturbance and the need for improved roads.
 - c) Whenever possible, avoid road construction on steep slopes.
 - d) When selecting the appropriate erosion control measures, be aware that although some measures may require greater initial expense, significant savings will occur over the life of the project in reduced maintenance and replacement costs. Furthermore, a well-developed erosion and sediment control plan may also reduce regulatory delays in approving and monitoring the project.

- e) Use certified weed-free seed of local ecotypes of native vegetation when reseeding disturbed areas and consider revegetation re-growth and cover. Consider animal and plant compositions when determining the frequency and timing of mowing near turbines.
- 7) Health and Safety - Most of the safety issues associated with wind energy projects can be dealt with through adequate setbacks, security, safe work practices, and the implementation of a fire control plan.
- a) Consider safety setback distances from wind turbines and habitable dwellings, public highways, and property lines when evaluating specific parcels for development. Setbacks should provide adequate spacing from falling ice, blown turbine parts, and major structural failure, which can mitigate siting issues.
 - b) Design facilities and turbine pads to prevent or avoid public and worker safety problems. Consider the benefits of underground wiring between turbines and project substation.
- 8) Cultural, Archaeological, and Paleontological Resources - During project design and site development, important cultural and fossil resource sites should be avoided and protected or else a mitigation plan should be developed. Special care should be taken to preserve the confidentiality as well as the integrity of certain sensitive resources or sites sacred to Native Americans.
- a) Identify and avoid potentially sensitive cultural, historical, or pre-historical resources and involve all stakeholders early on.
 - b) Consult with the South Dakota State Historical Society (Table 1) and other qualified professional specialists familiar with cultural and fossil resources in the project development area.
 - c) Some sensitive resources and sites may be confidential to Native Americans. Respect this confidentiality and work closely with tribal representatives to protect these resources by avoiding disruption to these sites.
 - d) Design project site layout to avoid sensitive resources, if possible.
 - e) Prepare a monitoring and mitigation plan for protection of sensitive resources during construction and operation of the project. Require appropriate mitigation of unavoidable impacts and monitor to ensure measures are implemented.
 - f) Allow adequate time in the project schedule for data and specimen recovery, mapping, analysis, and reporting.

- 9) Socioeconomic, Public Services, and Infrastructure - Developers and other stakeholders should coordinate with local communities and/or agencies to determine how the project may affect the community's fire protection and transportation systems and nearby airports and communications systems. Communities should work with wind project developers to ensure that any financial burden placed on them will be compensated through appropriate/reasonable property tax or other revenues.
- a) Identify any community services, costs, and infrastructure that may be affected by a project and work to involve all stakeholders in solving any conflicts and designing mitigation plans. Work with all the concerned stakeholders to develop appropriate mitigation for unavoidable impacts and monitor compliance to ensure the measures are implemented. Attempt to avoid or minimize potential impacts on community services, costs, and infrastructure.
 - b) House Bill 1235, passed during Legislative Session 2003, is an act to provide for the taxation of wind energy property in South Dakota, encouraging developers to build in South Dakota yet help local communities. As any changes to the property tax rate are considered, local taxing jurisdictions should seek to recover only those costs directly associated with services to the wind development to avoid discouraging new wind projects. Involve local communities in economic plan and work to be good neighbors.
 - c) Recognize that some districts, counties, and/or cities do not have an established zoning and/or permitting process applicable to wind power development. Do not exploit this fact rather work with appropriate local officials to establish reasonable parameters and make the process as clear to the public as possible.
 - d) Use local contractors and providers for supplies, services, and equipment, when possible, during the construction and operation phases of the project.
 - e) Acknowledge that there may not be specific needs by local communities for electricity generated by the proposed wind power project, therefore substantive public benefits should be provided beyond hosting the renewable energy facility.
 - f) Provide information to all stakeholders in regards to future project expansions to ensure all stakeholders have precise information. Recognize that developers may not be fully informed about future expansions and stakeholders may have issues and concerns that are dependent on the project scale.

- g) Expanded projects may involve impacts not specifically addressed during the initial project. Anticipate and make provisions for future site decommissioning and restoration.

10) Solid and Hazardous Wastes - Solid wastes need to be collected from dispersed sites and properly disposed of in a manner consistent with other power plants or facilities. Non-hazardous fluids should be used where possible, and a Hazardous Materials Waste Plan should be developed if their use cannot be avoided. By performing major maintenance and repair work off-site, certain problems can be avoided.

- a) Ensure that construction wastes are collected from all wind power sites and disposed of at a licensed facility. Waste disposal practices should not be different in wind power from those required at other power plants or repair facilities.
- b) Anticipate fluid leaks and avoid hazardous leaks by using non-hazardous fluids. Design a Hazardous Materials Waste Plan to address avoidance, handling, disposal, and cleanup, when necessary.
- c) Conduct turbine maintenance facilities and major turbine repairs off-site.

11) Air Quality and Climate - Wind projects produce energy without generating many of the pollutants associated with fuel combustion. Temporary, local emissions associated with project construction and maintenance can be minimized, and any micro-climatic impacts should be insignificant.

- a) Address air quality issues potentially associated with construction and operation of the wind generation project. Mitigate any impacts during sensitive operations so the overall impact is relatively small and temporary.

Table 1. Contact information for agencies in South Dakota.

Name	Specialty	Agency	Address	Telephone	Email
Silka Kempema	Birds and Bats	SDGFP	523 E Capitol Ave Pierre, SD 57501	605-773-2742	silka.kempema@state.sd.us
Natalie Gates	Federal Wildlife Regulations	USFWS	420 South Garfield Avenue, Suite 400 Pierre, SD 57501	605-224-8693	natalie_gates@fws.gov
Jill Shaffer	Bird Research	USGS/NPWRC	8711 37th St. SE Jamestown, ND 58401	701-253-5547	jshaffer@usgs.gov
Ken Higgins	Grassland Birds	USGS/SDSU	Dept of Wildlife & Fisheries Sciences Box 2140B, Brookings, SD 57007	605-688-6121	terry_symens@sdstate.edu
Kevin Luebke	Wildlife Conservation	NRCS	200 4th St SW Huron, SD 57350	605-352-1242	kevin.luebke@sd.usda.gov
Great Plains Office	Diane Mann-Klager	BIA	115 4th Ave SE Aberdeen, SD 57401	605-226-7343	Diane.Mann-Klager@bia.gov
Paige Hoskinson	Archeology	SHPO	900 Governors Drive Pierre, SD 57501	605-773-6004	paige.hoskinson@state.sd.us

Table 2. Contact information for experts and/or universities in South Dakota

Name	Specialty	Organization	Address	Telephone	Email
Scott Pedersen	Bats	SDSU	Dept of Biology Box 2207B Brookings, SD 57007	605-688-5529	scott_pedersen@sdstate.edu
Cheryl Schmidt	Bats	BS BioServ, Inc.	18897 Eichler Rd Newell, SD 57760	605-456-1470	cschmidt@bsbioserv.com
Joel Tigner	Bats	Batworks	2416 Cameron Drive Rapid City, SD 57702	605-721-4564	batworks@rushmore.com
Kristel Bakker	Birds	DSU	Dept of Biology SC 128 Madison, SD 57042	605-256-5182	kristel.bakker@dsu.edu
Kent Jensen	Birds	SDSU	Dept of Wildlife & Fisheries Sciences Box 2140B Brookings, SD 57007	605-688-6121	kent.jensen@sdstate.edu
Dave Swanson	Birds	USD	Dept of Biology 191 Churchill-Laines Labs Vermillion, SD 57069	605-677-5211	dlswanso@usd.edu
Dan Tallman	Birds	NSU	Dept of Biology; emeritus professor 1200 South Jay Street Aberdeen, SD 57401	605-626-7707	tallmand@northern.edu
Corey Huxoll	Eagles	SDGFP	523 E Capitol Ave Pierre, SD 57501	605-773-4195	corey.huxoll@state.sd.us
Rocco Murano	Waterfowl	SDGFP	South Dakota State Univeristy Brookings, SD 57007	605-688-4786	rocco.murano@state.sd.us
Dennis Skadsen	Butterflies	SDACD/Day Co.	600 Hwy 12, Suite 1 Webster, SD 57274	605-345-4661	dennis.skadsen@sd.nacdnet.net

Table 2. Contact information for experts and/or universities in South Dakota, cont.

Name	Specialty	Agency	Address	Telephone	Email
Paul Coughlin	Habitat	SDGFP	523 E Capitol Ave Pierre, SD 57501	605-773-4194	paul.coughlin@state.sd.us
Dave Ode	Native Plants	SDGFP	523 E Capitol Ave Pierre, SD 57501	605-773-4227	dave.ode@state.sd.us
Dan Hubbard	Wetlands	SDSU	Dept of Wildlife & Fisheries Sciences Box 2140B Brookings, SD 57007	605-688-4780	hubbardd@sdstate.edu
Tim Olson	Wetlands	SDGFP	523 E Capitol Ave Pierre, SD 57501	605-773-3658	tim.olson@state.sd.us
Karen Gaines	Landscape Ecology	USD	Dept of Biology 414 E Clark, Vermillion, SD 57069	605-677-6567	kfgaines@usd.edu
Carter Johnson	Landscape Ecology	SDSU	Dept of Horticulture, Forestry & Parks NPB 201, Box 2140A Brookings, SD 57007	605-688-4729	carter_johnson@sdstate.edu
Holly Downing	Dean of Dept	BHSU	Dept of Biology Jonas Rm 108 Spearfish, SD 57799	605-642-6056	hollydowning@bhsu.edu

Table 3. Contact information for environmental/wildlife interest groups in South Dakota.

Name	Agency	Address	Telephone	Email
Rick Warhurst/Paul Bultsma	Ducks Unlimited (Great Plains)	22525 River Rd Bismarck, ND 57503	701-355-3500	rwarhusrt@ducks.org pbultsma@ducks.org
Pete Bauman	The Nature Conservancy (Tallgrass Prairie)	PO Box 816, Clear Lake, SD 57226	605-874-8517	pbauman@tnc.org
Bob Paulson	The Nature Conservancy (Black Hills)	8100 Sheridan Lake Rd Rapid City, SD 57702	605-342-4040	bpaulson@tnc.org
Brad Phillips	South Dakota Bat Working Group	3406 Ivy Ave Rapid City, SD 57701	605-721-6607	bphillips@rushmore.com
Jerry Schlekeway	South Dakota Chapter of Izaak Walton League	1008 N Huron Ave. Pierre, SD 57501-1438	605-224-7780	gschlek@pie.midco.net
Kurt Forman	South Dakota Chapter of The Wildlife Society	419 Hunters Ridge Brookings, SD 57006	605-692-8359	sdtws@brookings.net
Chris Hesla	South Dakota Wildlife Federation	PO Box 7075, Pierre, SD 57501	605-224-7524	sdwf@pie.midco.net
Dave Johnson	Missouri Breaks Audubon Society	PO Box 832 Pierre, SD 57501		mbas@pie.midco.net
Richard Barnett	United Sportsmen for South Dakotans	PO Box 526 Aberdeen, SD 57402		

Appendix A. Local resource management agency contacts.

Name/Title	Agency	Address	Telephone	Email
Mike Kintigh/Regional Supervisor	SDGFP Region 1	3305 West South St Rapid City, SD 57702	605-394-6837	mike.kintigh@state.sd.us
Arden Petersen/Regional Supervisor	SDGFP Region 3	4500 S Oxbox Ave Sioux Falls, SD 57106	605-362-2706	arden.petersen@state.sd.us
Cliff Stone/Regional Supervisor	SDGFP Region 2	1550 King Ave Chamberlain, SD 57325	605-734-4532	cliff.stone@state.sd.us
Doug Alvine/Regional Supervisor	SDGFP Region 4	400 West Kemp Watertown, SD 57201	605-882-5201	doug.alvine@state.sd.us
Head Office	SDACD	PO Box 515 Presho, SD 57568	605-895-4099	info@sdconservation.org
Private lands biologist	USFWS Partners for Fish & Wildlife	PO Box 247 Brookings, SD 57006	605-697-2500	kurt_forman@fws.gov
Manager	USFWS Waubay NWR	44401 134A St Waubay, SD 57273	605-947-4521	douglas_leschisin@fws.gov
Manager	USFWS Sand Lake NWR	39650 Sand Lake Drive Columbia, SD 57433	605-885-6320	sandlake@fws.gov
Manager	USFWS Lacreek NWR	HC5 Box 114 Martin, SD 57551	605-685-6508	lacreek@fws.gov
Manager	USFWS Lake Andes NWR	38672 291st Street Lake Andes, SD 57356	605-487-7603	LakeAndes@fws.gov
Manager	USFWS Madison WMD	PO Box 48 Madison, SD 57042	605-256-2974	MadisonWetlands@fws.gov
Manager	USFWS Huron WMD	Rm 309 Federal Bldg 200 4th St SW Huron, SD 57350	605-352-5894	HuronWetlands@fws.gov

Appendix B. Acronyms used in tables and appendices.

Acronyms	Description
BHSU	Black Hills State University
BIA	Bureau of Indian Affairs
DSU	Dakota State University
NPWRC	Northern Prairie Wildlife Research Center
NRCS	Natural Resources Conservation Service
NSU	Northern State University
NWR	National Wildlife Refuge
SDGFP	South Dakota Game, Fish and Parks
SDACD	South Dakota Association of Conservation Districts
SDSU	South Dakota State University
SHPO	State Historic Preservation Office
USD	University of South Dakota
USFWS	U. S. Fish and Wildlife Service
USGS	U. S. Geological Survey
WMD	Wetlands Management District

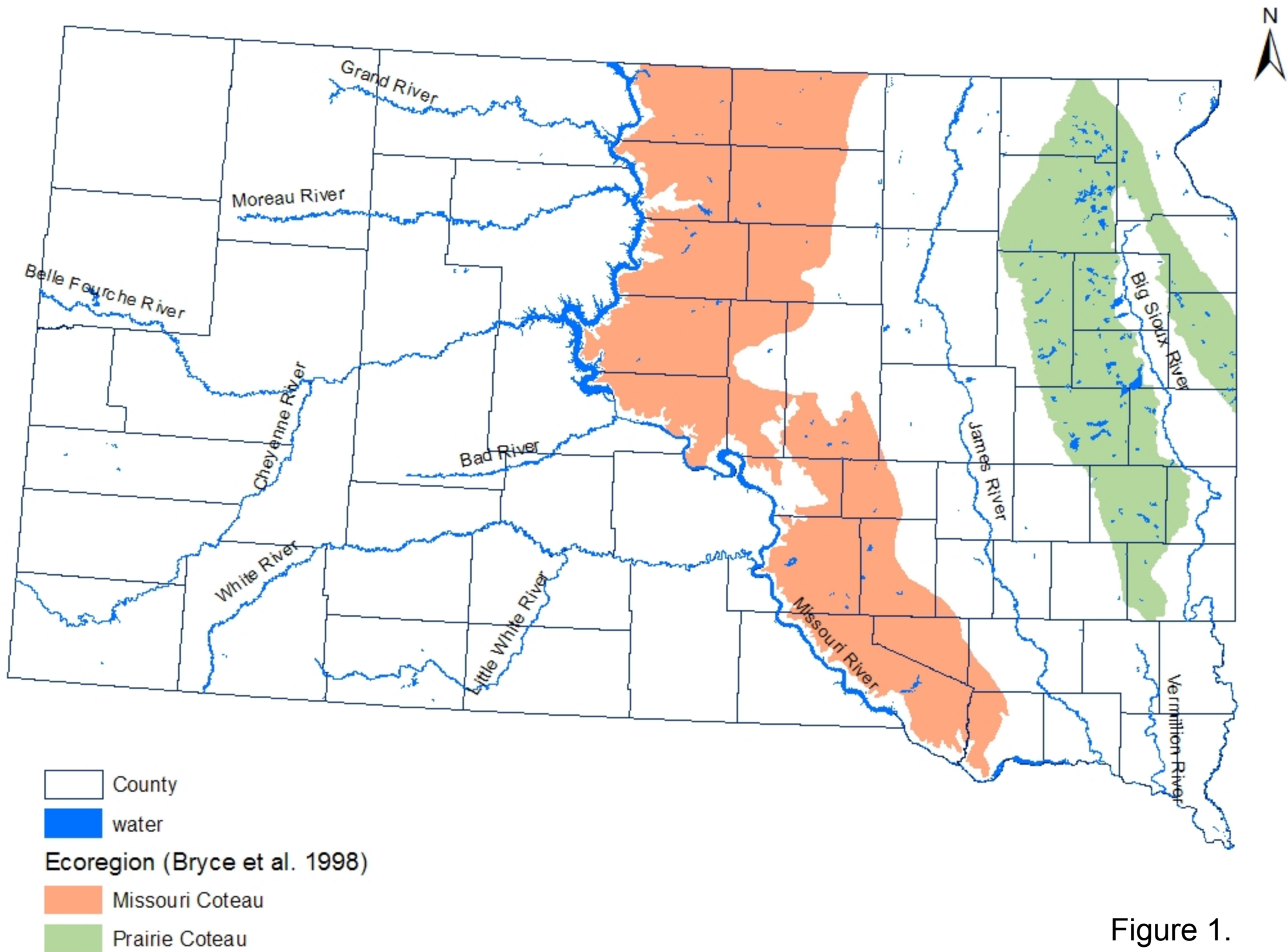


Figure 1.

ROTTERDAM 2ND TO 5TH MAY 2017

POST CONFERENCE REPORT

Another intensive four days of conference but still time to meet old friends and make new ones. The venue at de Doelen worked well and the food and refreshments were good and varied. Thanks to Daniele Ragni and his team at TU Delft for all their help; also to Gijssjan van Blokland and NAG (the Acoustical Society of the Netherlands) and Eric Roelofsen and NSG (the Dutch Noise Abatement Society) for their support.

A few statistics. 195 delegates. Can't quite break that 200 ceiling. We have had one hundred and ninety something at the last four events. 80% from Europe with 38 delegates from Germany topping the country league for the first time. But not to dismiss the huge support we have from outside Europe with 40 delegates. We do have a record this year with delegates from 27 different countries, so we are truly international.

The make up of delegates is changing. More manufacturers and industry people this time. Are delegates getting younger? I think so, or is it just me getting older? A few more women this year, but still only around 20%. It would be nice to see more next time.

We had 76 papers – just under 40% of delegates presented. That's a bit lower than 2015 and eased the pressure on the programme a bit – allowing us to have a guest speaker – professional miller Willem Roose to tell us the story of windmills. And an extra workshop on cyclical pitch control (CPC) – of which more later.

The two evening workshops were well attended - the first on propagation and other poster subjects and the second run by TU Delft and GRAS on the Aeroacoustic Investigation of Noise Sources. Thanks to everyone who organised and contributed to those.

We invited papers on Shadow Flicker this year as there does not seem to be any other forum where this can be discussed. We had four good papers and hope to repeat it next time.

I said in my last post conference report in 2015 that 4 days is really too long. I know that many people can't get that much time off. We will see how things develop next time but, if we can bring it down to three full days without compromising the programme we will certainly consider that.

Finally, the conference dinner was held on the 90 year old paddle steamer Majesteit as it toured the Rotterdam river and docks. Excellent food and craic.

WHERE ARE WE NOW – AND WHERE NEXT?

In my last post conference report I tried to summarise where we were and where we were going. I suggested possible themes for 2017. I have to say that generally my predictions were not very accurate! But that won't stop me from trying again.

Propagation

I think perhaps I was too complacent last time that we had a good understanding of the propagation mechanism of sound from wind turbines. Papers, particularly from Sjoblom and Conrady showed that perhaps we need to get together more with our meteorologist colleagues to look more closely at how the atmosphere works. On the whole we can be pretty accurate, but perhaps more work in propagation over such surfaces as water, snow or sand would be useful.

Regulations, Perception and Health Effects.

Surprisingly few papers on regulations this time but plenty on perception and health effects. There is an enormous range of noise limits throughout the world which reflects the fact that none appear to be based on any real research on what levels affect people and what the balance should be between protecting the amenity of wind farm neighbours and the need for renewable energy. It would be good to see some of the resources currently being devoted to infrasound research diverted to work on the impact of audible sound levels. And more work involving stakeholders of the type described by van den Berg in his paper.

Designing the Windfarm for Compliance

After 2015, I thought there would be more papers on the optimisation of windfarms – that is ways of running windfarms close to the noise limit for more of the time. As it happened there was none. But it is a subject that may become increasingly important in the future.

Background Noise, Assessment and Compliance Testing.

We only categorised three papers this year as background noise. However, they gave us a very helpful insight into how background noise varies with the conditions of measurement.

A good selection of papers on assessment and compliance testing. There was a wide variation in the approach taken so perhaps this is a subject that will run for some time yet. For those who would like a standardised approach there is more work to be done.

Tones

In 2015 I noted that there were less papers on tonal noise and that trend continued this time to the extent that we put tones together with low frequency noise in a single session. Manufacturers generally seem to have ways of mitigating tones, but they do still occur.

Small Turbines

I was disappointed that we did not have enough papers on small turbines even to have a session. One of the difficulties is that noise from small turbines varies greatly from turbine to turbine so it is difficult to generalise findings on a single turbine. Some case studies on small turbines would be a useful addition to the conference though.

Trailing Edge Noise

As in 2015 we had a whole day's session centred round trailing edge noise – including theoretical and wind tunnel modelling, combined source and propagation modelling and source location using arrays. University of Siegen and TU Delft had almost half the papers between them but interesting contributions from all presenters.

Infrasound

We had a small session on infrasound. We separated it from low frequency noise this year because the two are often erroneously lumped together when describing turbine noise.

Amplitude Modulation

Plenty of papers on amplitude modulation again this time. Some of the activity was related to the work that has been done recently in the UK. The metric developed by the Institute of Acoustics Noise Working Group seems to have been widely accepted. I suggested in my 2015 post conference report that I was not convinced that stall was the whole story as far as AM was concerned. There were suggestions this year that we should be talking about flow separation rather than stall and that would seem to be appropriate. There is still more work to be done on both the mechanism causing it and on its impact on people. But it remains a feature that appears to hit the headlines in a small number of countries.

Cyclical Pitch Control

And whilst we are on the subject of AM, I was keen to try to get people talking about CPC and so we had a mid-day workshop run by Matthew Cand. It was cautiously titled "CPC and other avenues . . ." in case the CPC part of it came to a halt. As it happened there was a good debate and we had to extend ten minutes into the lunch break. Understandably, those who know most about the subject (turbine manufacturers) are not willing to say anything. But those of us involved in noise assessment and mitigation are keen to know whether we can use this to remedy AM. More in 2019?

WTN 2019 - Themes

Here are a few thoughts of what we need to address between now and 2019:

Build on how background noise varies with various factors. Does it vary with seasons, wind directions types of foliage and other factors?

How well does background noise mask turbine noise? We have had a few papers over the years on this – but we still need more.

Assessment and compliance testing. Should we be aiming at an agreed standard method? Or not?

Small turbines – some case studies describing the particular problems that have arisen with small turbines.

Cyclical Pitch Control. Can it help reduce AM? Does it reduce overall sound power?

More dose response tests on turbine audible noise to allow us to produce more robust regulations.

Why do some people become ill near wind turbines? Perhaps this is no longer a study that acousticians are qualified to do?

And one from 2015 - are LF tones being missed or wrongly interpreted as merely low frequency noise or even infrasound as suggested by Evans in Glasgow?

And, of course any other subjects that are useful to further the knowledge of Wind Turbine Noise.

Any feedback will be welcome – good or bad. Please contact me by email.

Dick Bowdler

dick@windturbine noise.eu

**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**

**RESPONSE TO
APPLICANTS FIRST SET OF DATA
REQUESTS TO
INTERVENOR**

Below, please find Prevailing Wind Park, LLC's ("Applicant") First Set of Data Requests to Intervenor Karen Jenkins. Please submit responses within 10 business days or promptly contact the undersigned to discuss an alternative arrangement.

1-1) Provide copies of all data requests submitted by the PUC Staff to you in this proceeding and copies of all responses to those data requests. Provide this information to date and on an ongoing basis.

Attached

1-2) With respect to the Project, please:

a) Identify, if any, concerns you have regarding the Project's satisfaction of the criteria for the Project to receive a facility permit from the South Dakota Public Utilities Commission; and b) Identify any other concerns you have regarding the Project.

Please see my Amended Response to Staff's First Set of Data Requests that I have forwarded to you.

1-3 Identify whether you own property or reside in the vicinity of the Prevailing Wind Park Project ("Project") and, if so, the location (by section, township, and range) of such property and/or residence.

My husband and I own an 8 acre property with a 100+ year old farmhouse and barn with outbuildings in Section 30 Fair Township 97N, and Range 60W.

1-4 If you have a residence in the vicinity of the Project, identify whether you live at the residence throughout the entire year and, if not, how many months of the year you reside at the residence.

We reside here year round.

1-5 Identify how you use your land, including, but not limited to, whether you use your land for agricultural purposes.

We use our land as our sanctuary from urban living and as a Hobby Farm. We also hay some of the acreage every year.

1-6 Identify any sensitive or unique features of your property that you assert would be impacted by the Project.

Our property has a unique 360 degree view of the landscape and our two story house has many large windows and doors on every side which afford us a beautiful and peaceful view of the rural landscape which includes tilled farmland, pastures with cattle grazing, a wide open view of the sky, and many types of wildlife including a large variety of birds, including bald eagles, cranes, the twice yearly migration of ducks and geese, deer, woodchucks, raccoons, coyotes, badgers, rabbits, quail, and pheasants. There is a naturally fed pond just west of our house on the adjacent property and a creek that runs from that, through our property and on to the property east of us which becomes tree-lined and feeds a pond on that property. Both properties east and west have cows and calves grazing most of the year. The adjacent north and south properties are tilled farmland which alternate from corn, soybeans, and alfalfa.

Our property fulfills the dream we have shared since we married in 1984, to retire and live in the country, experience the seasons, enjoy the peacefulness, have a hobby farm, and enjoy life. We believed we would be able to either leave a beautiful and valuable property to our children as an inheritance or if needed, as we age and become unable to maintain it, be able to sell it and use the funds from the sale to relocate to another lovely residence.

1-7) Describe any mitigation measures that could address your concerns with respect to the Project.

Please refer to my Amended Response to Staff's First Request for Data that I have forwarded to you.

1-8) Identify any documents, information, education, training, or professional experience you have relied upon to form your opinions concerning the Project. Where you have relied upon documents or other tangible materials, please provide such documents and/or materials.

My personal experience of the process of the development of the Beethoven Wind Farm and this Project.

My personal experience of living three miles from the Beethoven Wind Farm.

The experiences that Sherm and Lori Fuerniss have shared with me living by the Beethoven Wind Farm.

Discussions I have had with individuals who live in the communities surrounding us regarding the offensive red blinking lights seen for miles and miles, the waste of our taxpayer dollars, the secrecy of the developers of the Beethoven Project (the same developers of the Project), and the disgust of how they deceived the communities that the Beethoven Project would provide many permanent jobs to the community.

Documents and Literature

Siting Guidelines for Wind Power Projects in South Dakota / Attached

Particularly, the following paragraph was alarming to me and had a great impact on the opinion I have that the Project is proposed for the wrong location. This project is in the Missouri River area highlighted on the map, an area that is considered unique and rare in South Dakota.

“Although wind power is considered "green energy," many concerns have been expressed about the effects of their presence on plants and animals native to South Dakota. Specific areas of South Dakota have been identified as potential sites for wind energy development, and these sites are located in, but not limited to, the Coteau des Prairies in eastern South Dakota and the Missouri River in central South Dakota, which are unique/rare in South Dakota. Additional areas in other regions of the state may be identified/added by ongoing studies or further infrastructure development (e.g., transmission lines and substations). “

Wind Turbine Syndrome: A Report on a Natural Experiment by Dr. Nina Pierpont

Paradise Destroyed

The Destruction of Rural Living by the Wind Energy Scam by Gregg Hubner

Websites:

SDPUC

AWEA / Too many articles and too much info to attach.

WE-CAREsd.org website / Too many articles and too much info to attach

Wind Watch.org website / Too many articles and too much info to attach

INCEEUROPE website / Three attachments

1-9) Identify any expert witnesses you plan to have testify on your behalf, and for each expert witness, describe the subject matter regarding which the witness will testify.

My husband Mike Jenkins and myself may testify on our experiences of and with the Beethoven Wind Farm and the development of the Project, at this time no other expert witnesses are planned, however I reserve the right to call witnesses as the process unfolds.

1-10) Are you asserting the Project will negatively impact property value? If so, provide copies of any appraisals that have been conducted for your property within the last ten (10) years.

Yes, I am sure the Project will negatively impact property value. More concerning is the chance that one or both of us may not be able to remain in our home, due to adverse health effects, or whether we would even want to remain in our home next to the existing Beethoven Wind Farm and this Project. Most concerning is how we could ethically offer it up to anyone for sale. We depend on our home and property as our largest asset.

An appraisal was done when we purchased our home and property in 2010, I do not have it available.

1-11) Identify any communications, written or otherwise, you have had with units, officials, and/or representatives of local, state, and/or federal governments or agencies concerning the Project.

I participated in the process of the Bon Homme County Zoning Board on Zoning and Met Tower, and Public Hearings in the same County regarding zoning for Industrial Wind Towers.

I attended the Charles Mix County Commissioners regular hearing on August 9, 2018.

I presented to the Hutchinson County Zoning Board my concerns of the deception of the developer of the Project at the regular August 2, 2018 meeting.

I presented to the Hutchinson County Board of Adjustment my request for protection, for their strong consideration of the concerns I had, and the conditions I felt needed in the event they would not deny the Conditional Use Permit at the Public Hearing on September 4, 2018.

- a) For any written communications, provide a copy of the communication; and Attached
- b) For any unwritten communications, provide the date of the communication, the persons involved, and the subject matter of the communication.

Simple calls to confirm the meetings were on schedule as I live 20 miles from the Hutchinson County Courthouse and the Bon Homme County Courthouse. Dates not available.

Dated this 1st day of October, 2018

Karen Jenkins

28912 410th Ave

Tripp SD 57376