APPENDIX A - WIND TURBINE CHARACTERISTICS

Wind Turbine Characteristics

Characteristic	Turbine Model[a]
	GE 3.8-137
Nameplate capacity	3.83 MW
Hub height	110 meters (361 feet)
Rotor diameter	137 meters (449 feet)
Total height	178.5 +/- 1 meters (586 +/- 3 feet)
Cut-in speed[b]	3 m/s
Rated speed[c]	12 m/s
Cut-out speed[d]	25 m/s over 600s 30 m/s over 30s 34 m/s over 3s
Rotor area	14,741 m^2
Rotor speed	Variable – max is around 13.6 rpm

(a) MW = megawatt; m/s = meters per second; m^2 = square meters; rpm = revolutions per minute
(b) Cut-in wind speed = wind speed at which turbine begins operation
(c) Rated speed = wind speed at which turbine reaches its rated capacity
(d) Cut-out wind speed = wind speed above which turbine shuts down operation
(e) High Wind Operation package

APPENDIX B - SOUND STUDY

Sound Study

Prevailing Wind Park, LLC

Prevailing Wind Park
Project No. 105644

Revision 5
05/30/2018

Sound Study

prepared for

Prevailing Wind Park, LLC
Prevailing Wind Park
Bon Homme/Charles Mix/Hutchinson Counties, SD

Project No. 105644

Revision 5
05/30/2018

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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LIST OF ABBREVIATIONS

Abbreviation	**Term/Phrase/Name**
ANSI	American National Standards Institute
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
CadnaA	Computer Aided Design for Noise Abatement
dB	Decibel
dBA	A-weighted decibels
DEM	Digital Elevation Model
Developer	Prevailing Wind Park, LLC
GE	General Electric
Hz	Hertz
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
L_{90}	the sound level exceeded 90 percent of the time period
L_{eq}	equivalent-continuous sound level
LWES	Large Wind Energy System
L_x	exceedance sound level
MP	measurement point
Project	Prevailing Wind Park
The Act	The Noise Control Act of 1972
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WES	Wind Energy System

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REVISION HISTORY

Rev	Issue Date	Release Notes
0	03-Apr-2018	Original release
1	09-Apr-2018	Revised wind turbine layout, incorporated client comments
2	11-Apr-2018	Added REC-138
3	16-Apr-2018	Revised wind turbine layout
4	27-Apr-2018	Revised wind turbine layout
5	14-May-2018	Incorporated client comments

1.0 EXECUTIVE SUMMARY

Prevailing Wind Park, LLC (Developer) is proposing to construct the Prevailing Wind Park near Avon, South Dakota, in Bon Homme, Hutchinson, and Charles Mix Counties (Project). The Project will consist of 57 to 61 wind turbines with a maximum nameplate capacity of up to 219.6 megawatts (MW), although output at the point of interconnection will be limited to a maximum of 200 MW. A total of 63 wind turbine sites were analyzed for two turbine models: General Electric (GE) 3.8-137 and Vestas V136-3.6. This sound assessment was completed to determine if the Project can operate in compliance with the applicable sound regulations.

Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell) conducted an ambient sound survey and sound modeling study for the proposed Project. There were several objectives in this study, which included:

- Identification of any applicable county, city, state, or federal noise ordinances and other applicable sound guidelines;
- Measure ambient sound levels at noise-sensitive receivers;
- Estimation of the operational sound levels from the hypothetical Project layout using the three-dimensional sound modeling program Computer Aided Design for Noise Abatement (CadnaA); and
- Determination if the wind farm can operate in compliance with the identified applicable regulatory standards.

There are no federal or state noise regulations that apply to this Project. Therefore, only local regulations would apply. Bon Homme County has adopted a zoning ordinance that pertains to wind energy systems. The ordinance limits sound levels of WES to 45 dBA at occupied receptors, unless a signed waiver or easement is obtained from the owner of the residence. Neither Charles Mix nor Hutchinson County has a numerical noise limit. Therefore, the Bon Homme County ordinance sound level limit was used as the design goal for all areas of the Project.

The wind turbines were modeled using manufacturer-specified sound power levels. Sound pressure levels were predicted at all receivers within and surrounding the Project area. There are no expected exceedances of the identified regulations due to operation of any of the proposed wind turbine locations of the Project.

2.0 ACOUSTICAL TERMINOLOGY

The term “sound level” is often used to describe two different sound characteristics: sound power and sound pressure. Every source that produces sound has a sound power level. The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the surrounding environment. The acoustical energy produced by a source propagates through media as pressure fluctuations. These pressure fluctuations, also called sound pressure, are what human ears hear and microphones measure.

Sound is physically characterized by amplitude and frequency. The amplitude of sound is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. To the average listener, a 3-dB change in a continuous broadband sound is generally considered “just barely perceptible”; a 5-dB change is generally considered “clearly noticeable”; and a 10-dB change is generally considered a doubling (or halving, if the sound is decreasing) of the apparent loudness.

Sound waves can occur at many different wavelengths, also known as the frequency. Frequency is measured in hertz (Hz) and is the number of wave cycles per second that occur. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in the lower and higher frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in A-weighted decibels, or dBA. For reference, the A-weighted sound pressure level and subjective loudness associated with some common sound sources are listed in Table 2-1.

Table 2-1: Typical Sound Pressure Levels Associated with Common Noise Sources

Sound Pressure Level (dBA)[a]	Subjective Evaluation	Environment	
		Outdoor	**Indoor**
140	Deafening	Jet aircraft at 75 feet	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 feet	--
120	Threshold of feeling	Elevated train	Hard rock band
110		Jet flyover at 1,000 feet	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 feet, auto horn at 10 feet, crowd noise at football game	--
90	--	Propeller plane flyover at 1,000 feet, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph)[a] at 50 feet	Inside auto at high speed, garbage disposal
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 feet, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--

Source: Adapted from *Architectural Acoustics*, M. David Egan, 1988 and *Architectural Graphic Standards*, Ramsey and Sleeper, 1994.
(a) dBA = A-weighted decibels; mph = miles per hour

Sound metrics have been developed to quantify fluctuating environmental sound levels. These metrics include the exceedance sound level. The exceedance sound level, L_x, is the sound level exceeded during "x" percent of the sampling period and is also referred to as a statistical sound level. L_{90} levels are presented throughout this study. The L_{90} is a common L_x value and represents the sound level with minimal influence from short-term, loud transient sound sources. The L_{90} represents the sound level exceeded for 90 percent of the time period during which sound levels are measured. The L_{90} value is regarded as the most accurate tool for measuring relatively constant background noise and for minimizing the influence of isolated spikes in sound levels (i.e., barking dog, door slamming).

3.0 REGULATIONS

Federal, state, and county regulations were reviewed to determine the applicable overall sound level limits for the Project.

The Noise Control Act of 1972 (the Act) (U.S.C. 4901) mandated a national policy "to promote an environment for all Americans free from noise that jeopardizes their health or welfare, to establish a means for effective coordination of Federal research activities in noise control, to authorize the establishment of Federal noise emission standards for products distributed in commerce, and to provide information to the public respecting the noise emission and noise reduction characteristics of such products."

As required by the Act, the EPA established criteria for protecting the public health and wellbeing. However, these criteria do not constitute enforceable federal regulations or standards. The EPA has since delegated regulatory authority to local entities. Therefore, there are no federal noise regulations that apply to this Project.

Bon Homme County has adopted a zoning ordinance that pertains to wind energy systems. The ordinance limits sound levels of WES to 45 dBA at occupied receptors, unless a signed waiver or easement is obtained from the owner of the residence. Charles Mix County is only zoned in the townships, and because there are no turbines proposed for the townships, there are no zoning requirements for the Project within Charles Mix County (i.e., no zoning noise limits). Hutchinson County does not have a numerical noise ordinance.

Because there are no limits in Charles Mix and Hutchinson counties, the Bon Homme County ordinance sound level limit was used as the design goal for all areas of the Project. Therefore, the design criteria for the Project is 45 dBA at occupied receptors, unless a signed waiver or easement is obtained from the owner of the residence.

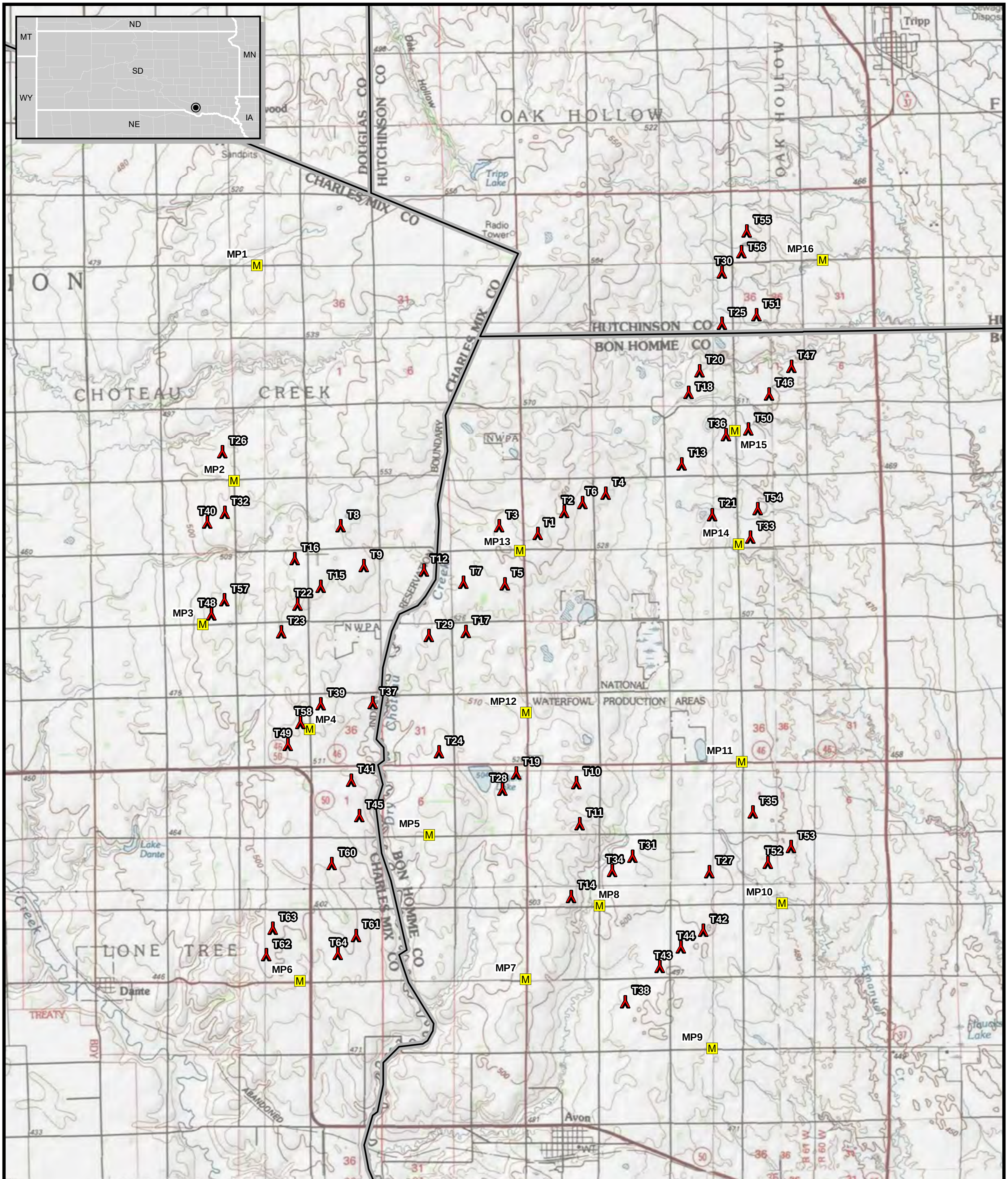
4.0 AMBIENT SOUND SURVEY

Burns & McDonnell personnel conducted an ambient sound survey of surrounding Project areas on March 12 and 13, 2018.

Measurements were taken using an American National Standards Institute (ANSI) S1.4 type 1 sound level meter (Larson David Model 831). The sound level meter was calibrated at the beginning and end of each set of measurements. None of the calibration level changes exceeded ± 0.5 dB. A windscreen was used at all times on the microphone, and the meter was mounted on a tripod. Certificates of calibration for the equipment used are available upon request. The microphone was located approximately 5 feet above ground level with the microphone directed towards the closest proposed wind turbine location and angled per the manufacturer’s recommendation. All measurements were taken when meteorological conditions were favorable for conducting ambient sound measurements, per ANSI standards (low wind, moderate temperatures, humidity, and no precipitation).

Ambient far-field measurements were made at 16 locations, labeled measurement point (MP) MP1 through MP16, as shown in Figure 4-1. The measurement points were selected because they were accessible and representative of existing ambient sound levels in the vicinity of noise-sensitive receivers.

The far-field sound level measurements were 5 minutes in duration, and measured values were logged by the sound meter at each measurement point. The sound levels varied at each measurement point due to the extraneous sounds that occurred during each measurement. The overall A-weighted L_{eq} and L_{90} sound levels collected during the ambient far-field measurements are shown below in Table 4-1. Sound levels measured were in the range of 21.5 dBA to 45.0 dBA L_{90}.



Path: \\bmcd\dfs\Clients\BTS\PowerDC\105644_PrvWindStudies\Studies\Geospatial\DataFiles\ArcDocs\105644_PrevailingWinds_85x11P.mxd • Coordinate System: NAD 1983 UTM Zone 14N • Units: Meter

LEGEND

- County Boundary
- Wind Turbine
- M Measurement Points

REFERENCE

0 1 2
MILES

0 1 2
KILOMETERS

N

PREVAILING WIND PARK
Measurement Points

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	04/25/2018

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Table 4-1: Ambient Measurements Data

Measurement Location	Sound Pressure Level (dBA)					
	Ambient (5:00 PM on 03/12/18)		Ambient (12:00 AM on 03/13/18)		Ambient (10:00 AM on 03/13/18)	
	L_{eq}	L_{90}	L_{eq}	L_{90}	L_{eq}	L_{90}
MP1	34.6	26.0	40.4	30.0	35.2	25.1
MP2	36.5	29.6	35.7	28.6	39.0	30.2
MP3	37.7	29.2	32.6	22.3	41.0	28.0
MP4	39.6	29.1	33.7	24.3	35.0	28.9
MP5	36.9	28.0	34.6	22.6	35.4	25.4
MP6	47.9	33.4	34.7	26.3	40.0	31.8
MP7	38.3	31.0	30.2	24.0	42.6	37.7
MP8	34.8	28.4	28.6	22.7	47.7	27.9
MP9	35.7	27.0	35.3	29.5	33.2	24.4
MP10	37.4	30.6	39.4	35.2	35.0	27.1
MP11	62.7	45.0	35.6	31.6	69.1	28.1
MP12	39.5	32.6	37.1	21.5	40.6	29.4
MP13	36.3	27.1	38.9	32.1	59.5	28.4
MP14	35.7	28.8	34.1	27.4	35.1	28.9
MP15	33.8	28.4	35.7	28.7	35.0	29.3
MP16	49.8	36.9	39.0	29.8	35.0	28.8

Extraneous sounds during the measurement periods included high speed traffic, birds, wind noise, and farm equipment. The measured sound levels and noise sources are presented in Appendix A.

5.0 SOUND MODELING

5.1 Wind Turbine and Transformer Sound Characteristics

The sound commonly associated with a wind turbine is described as a rhythmic “whoosh” caused by aerodynamic processes. This sound is created as air flow interacts with the surface of rotor blades. As air flows over the rotor blade, turbulent eddies form in the surface boundary layer and wake of the blade. These eddies are where most of the “whooshing” sound is formed. Additional sound is generated from vortex shedding produced by the tip of the rotor blade. Air flowing past the rotor tip creates alternating low-pressure vortices on the downstream side of the tip, causing sound generation to occur. Older wind turbines, built with rotors which operate downwind of the tower (downwind turbines), often have higher aerodynamic impulse sound levels. This is caused by the interaction between the aerodynamic lift created on the rotor blades and the turbulent wake vortices produced by the tower. Modern wind turbine rotors are mostly built to operate upwind of the tower (upwind turbines). Upwind wind turbines are not impacted by wake vortices generated by the tower and, therefore, overall sound levels can be as much as 10 dBA less. The rhythmic fluctuations of the overall sound level are less perceivable the farther one gets from the turbine. Additionally, multiple turbines operating at the same time will create the whooshing sound at different times. These non-synchronized sounds will blend together to create a more constant sound to an observer at most distances from the turbines. Another phenomenon that reduces perceivable noise from turbines is the wind itself. Higher wind speed produces noise in itself that tends to mask (or drown out) the sounds created by wind turbines.

Advancement in wind turbine technology has reduced pure tonal emissions of modern wind turbines. Manufacturers have reduced distinct tonal sounds by reshaping turbine blades and adjusting the angle at which air contacts the blade. Pitching technology allows the angle of the blade to adjust when the maximum rotational speed is achieved, which allows the turbine to maintain a constant rotational velocity. Therefore, sound emission levels remain constant as the velocity remains the same.

Wind turbines can create noise in other ways as well. Wind turbines have a nacelle where the mechanical portions of the turbine are housed. The current generation of wind turbines uses multiple techniques to reduce the noise from this portion of the turbine: vibration isolating mounts, special gears, and acoustic insulation. In general, all moving parts and the housing of the current generation wind turbines have been designed to minimize the noise they generate.

5.2 Model Inputs and Settings

Predicted sound levels were modeled using industry-accepted sound modeling software. The program used to model the turbines was the CadnaA, Version 2017, published by DataKustik, Ltd., Munich, Germany. The CadnaA program is a scaled, three-dimensional program that accounts for air absorption, terrain, ground absorption, and ground reflection for each piece of noise-emitting equipment and predicts downwind sound pressure levels. The model calculates sound propagation based on International Organization for Standardization (ISO) 9613-2:1996, General Method of Calculation. ISO 9613, and therefore CadnaA, assesses the sound pressure levels based on the Octave Band Center Frequency range from 31.5 to 8,000 Hz. Compliance with the regulations for all turbines operating should equate to compliance for any combination of the turbines operating.

5.2.1 Project Layout

Prevailing Wind's hypothetical layout contains 63 wind turbine sites, including alternatives. Predictive modeling was conducted to determine the impacts at the occupied residences shown in Appendix B.

5.2.2 Terrain and Vegetation

Terrain and attenuation from ground absorption can have a significant impact on sound transmission. U.S. Geological Survey (USGS) Digital Elevation Model (DEM) contours were imported into the model to account for topographic variations around the Project. The contours were overlaid onto high resolution, digital orthoimagery obtained from the U.S. Department of Agriculture (USDA) to visually check proper contour positioning. The terrain around the proposed Project is mostly rural with few minor changes in elevation. The land is primarily used for agricultural purposes. As such, vegetation is mostly low-lying with some small areas of trees. Therefore, vegetation was excluded from the analysis to maintain conservativeness in the model. Ground attenuation is expected to be fairly high, due to the "soft ground" of the surrounding areas; however, a conservative value was used in the model.

5.2.3 Sound Propagation and Directivity

CadnaA calculates downwind sound propagation using ISO 9613 standards, which use omnidirectional downwind sound propagation and worst-case directivity factors. In other words, the model assumes that each turbine propagates its maximum sound level in all directions at all times. While this may seem to over-predict upwind sound levels, this approach has been validated by field measurements. Under most normal circumstances, wind turbine noise is not significantly directional, but tends to radiate uniformly in all directions.

5.2.4 Atmospheric Conditions

Atmospheric conditions were based on program defaults. Layers in the atmosphere often form where temperature increases with height (temperature inversions). Sound waves can reflect off of the temperature inversion layer and return to the surface of the earth. This process can increase sound levels at the surface, especially if the height of the inversion begins near the surface of the earth. Temperature inversions tend to occur mainly at night when winds are light or calm, usually when wind turbines are not operating. CadnaA calculates the downwind sound in a manner which is favorable for propagation (worst-case scenario) by assuming a well-developed moderate ground-based temperature inversion such as can occur at night. Therefore, predicted sound level results tend to be higher than would actually occur.

The atmosphere does not flow smoothly and tends to have swirls and eddies, also known as turbulence. Turbulence is basically formed by two processes: thermal turbulence and mechanical turbulence. Thermal turbulence is caused by the interaction of heated air rapidly rising from the heated earth's surface, with cooler air descending from the atmosphere. Mechanical turbulence is caused as moving air interacts with objects such as trees, buildings, and wind turbines. Turbulent eddies generated by wind turbines and other objects can cause sound waves to scatter, which in turn, provides sound attenuation between the wind turbine and the receiver. The acoustical model assumes laminar air flow, which minimizes sound attenuation that would occur in a realistic inhomogeneous atmosphere. This assumption also causes the predicted sound levels to be higher than would actually occur.

5.2.5 Sound Emission Data

Acoustical modeling was conducted for the entire Project. Wind turbine heights and acoustical emissions were input into the model. The expected worst-case sound power levels for the GE 3.8-137 and Vestas V136-3.6 turbines were contained in documents provided by GE and Vestas based on various wind speeds. The sound emissions data supplied was developed using the International Electrotechnical Commission (IEC) 61400-11 acoustic measurement standards. The expected sound power level and modeled height for each turbine is displayed in Table 5-1.

Table 5-1: Wind Turbine Sound Power Levels

Turbine	Height	Sound Power Level (dBA)									
		31.5	63	125	250	500	1000	2000	4000	8000	A-wt.[a]
GE 3.8-137	110 m	78.5	86.8	92.6	96.4	99.4	102.1	102.0	93.7	79.2	**107.0**
Vestas V136-3.6	105 m	81.3	86.5	94.5	97.2	101.0	104.0	102.4	92.7	77.3	**108.2**

(a) A-wt. = A-weighted decibels

A point source at the hub was used to model sound emissions from the wind turbines. This approach is appropriate for simulating wind turbine noise emissions due to the large distances between the turbines and the receivers as compared to the dimensions of the wind turbines. The corresponding sound levels from the table above were applied to every point source.

Figure 4-1 shows the entire wind farm layout. Locations of receivers and wind turbines around the Project area were provided by the developer and are listed in Appendix B. Each receiver was assumed to have a height of 1.52 meters (5.0 feet) above ground level. Compliance with the regulation was assessed at the physical residence (each receiver).

The following assumptions were made to maintain the inherent conservativeness of the model and to estimate the worst case modeled sound levels:

- Attenuation was not included for sound propagation through wooded areas, existing barriers, and shielding
- All turbines were assumed to be operating at maximum power output (and therefore, maximum sound levels) at all times to represent worst-case noise impacts from the wind farm as a whole

5.3 Acoustical Modeling Results

Sound pressure levels were predicted for the identified receivers in the CadnaA noise modeling software using the manufacturer-specified sound power levels at each frequency and the assumptions listed above. CadnaA modeling results have been demonstrated in previous studies to conservatively approximate real-life measured noise from a source when extraneous noises are not present.

As previously mentioned, decibels are a logarithmic ratio of a sound pressure to a reference sound pressure. Therefore, they must be logarithmically added to determine a cumulative impact (i.e., logarithmically adding 50 dBA and 50 dBA results in 53 dBA). Logarithmically adding each of the individual turbine’s impacts together at each receiver provides an overall Project impact at each receiver.

The maximum model-predicted L_{eq} sound pressure levels at each receiver (the logarithmic addition of sound levels from each frequency from every turbine) are included in Appendix C. These values represent only the noise emitted by the wind turbines and do not include any extraneous noises (traffic, etc.) that could be present during physical noise measurements. There are no expected exceedances of the identified regulations due to operation of any of the proposed wind turbine locations of the Project. Extraneous sounds (grain dryers, traffic, etc.) may make the overall sound level higher than 45.0 dBA in some circumstances, but the turbines alone are not expected to cause that to happen.

Appendix D contains graphical representation of the Project's impact on the surrounding area for both GE and Vestas turbines. The figure depicts the maximum sound levels attributable to the new turbines.

6.0 CONCLUSION

Burns & McDonnell conducted a predictive sound assessment study for the proposed Prevailing Wind Park. The study included identification of applicable sound regulations and predictive modeling to estimate Project-related sound levels in the surrounding community.

Sound pressure levels were predicted at occupied receivers within and surrounding the Project area using manufacturer-specified sound power levels for each wind turbine. A number of conservative assumptions were applied to provide worst-case predicted sound pressure levels. Those results were then compared to the identified applicable regulations. There are no expected exceedances of the identified regulations due to operation of any of the proposed wind turbine locations of the Project.

APPENDIX A - AMBIENT MEASUREMENT DATA

Appendix A - Ambient Measurement Data

Prevailing Winds

Point Number	*LAeq*	*LA90*	*Notes*	
03/12/18 - 5:00PM to 7:00PM			**Meter1 Calibration before: 114.11**	**Meter2 Calibration before: 114.05**
36°F, 60% hm, 31°F dp, 4-9mph , clear skies			**Meter1 Calibration after: 113.91**	**Meter2 Calibration after: 113.91**
MP1	34.6 dBA	26.0 dBA	Distant traffic, light wind, existing wind farm not audible	
MP2	36.5 dBA	29.6 dBA	Distant traffic, birds, light wind, fan noise from nearby business	
MP3	37.7 dBA	29.2 dBA	Birds, light wind, distant traffic including large trucks, very distant airplane	
MP4	39.6 dBA	29.1 dBA	Birds, light wind, distant traffic	
MP5	36.9 dBA	28.0 dBA	Highway traffic, birds	
MP6	47.9 dBA	33.4 dBA	Highway traffic dominant, paused for local traffic	
MP7	38.3 dBA	31.0 dBA	Highway traffic, birds	
MP8	34.8 dBA	28.4 dBA	Birds, distant high speed traffic	
MP9	35.7 dBA	27.0 dBA	Nearby high speed traffic (409th Street), birds	
MP10	37.4 dBA	30.6 dBA	Distant high speed traffic, birds, horns	
MP11	62.7 dBA	45.0 dBA	Birds dominant, two high speed car passbys	
MP12	39.5 dBA	32.6 dBA	Birds, farm equipment, slight wind	
MP13	36.3 dBA	27.1 dBA	Slight wind	
MP14	35.7 dBA	28.8 dBA	Slight wind, distant high speed traffic	
MP15	33.8 dBA	28.4 dBA	Slight wind, distant birds, distant high speed traffic, backup alarm	
MP16	49.8 dBA	36.9 dBA	Birds dominant, slight wind	

Appendix A - Ambient Measurement Data

Prevailing Winds

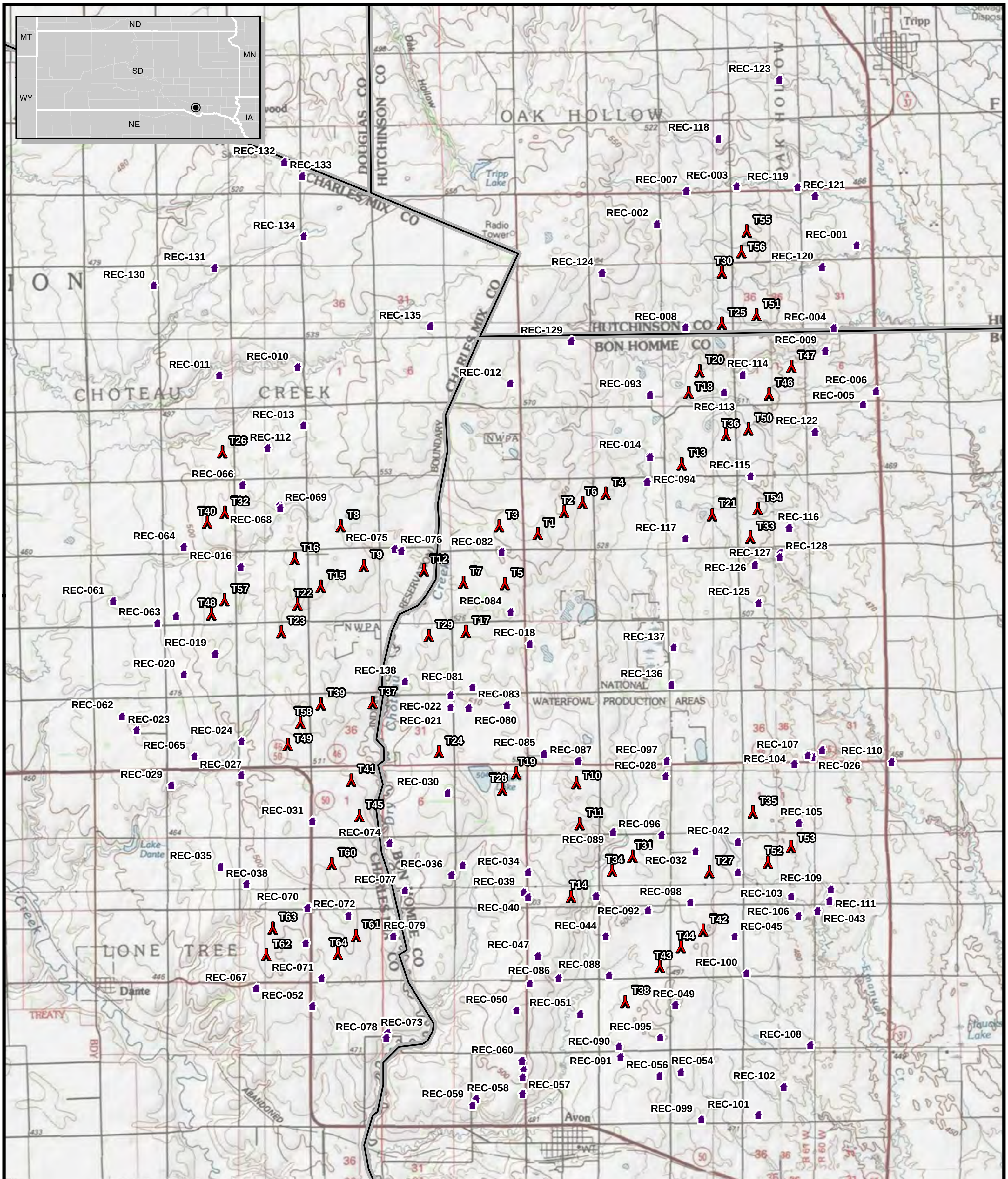
Point Number	*LAeq*	*LA90*	*Notes*	
03/13/18 - 12:00AM to 2:00AM			**Meter1 Calibration before: 114.19**	**Meter2 Calibration before: 113.87**
29°F, 74% hm, 21°F dp, 6-9 mph , clear skies			**Meter1 Calibration after: 113.83**	**Meter2 Calibration after: 114.20**
MP1	40.4 dBA	30.0 dBA	Wind turbines audible, light winds	
MP2	35.7 dBA	28.6 dBA	Wind turbines audible, light winds, sheep noise	
MP3	32.6 dBA	22.3 dBA	Very quiet, faint traffic	
MP4	33.7 dBA	24.3 dBA	Very quiet, faint traffic	
MP5	34.6 dBA	22.6 dBA	Distant traffic, large trucks, bull snort	
MP6	34.7 dBA	26.3 dBA	Traffic	
MP7	30.2 dBA	24.0 dBA	Traffic	
MP8	28.6 dBA	22.7 dBA	Distant high speed traffic	
MP9	35.3 dBA	29.5 dBA	Distant high speed traffic	
MP10	39.4 dBA	35.2 dBA	Slight wind	
MP11	35.6 dBA	31.6 dBA	Slight wind	
MP12	37.1 dBA	21.5 dBA	Distant high speed traffic	
MP13	38.9 dBA	32.1 dBA	Slight wind	
MP14	34.1 dBA	27.4 dBA	Slight wind	
MP15	35.7 dBA	28.7 dBA	Slight wind, distant high speed traffic	
MP16	39.0 dBA	29.8 dBA	Distant high speed traffic	

Appendix A - Ambient Measurement Data

Prevailing Winds

Point Number	*LAeq*	*LA90*	*Notes*
03/13/18 - 10:00AM to 12:00PM			**Meter1 Calibration before: 114.24 Meter2 Calibration before: 114.04**
30°F, 62% hm, 19°F dp, 3-4 mph , clear skies			**Meter1 Calibration after: 113.82 Meter2 Calibration after: 113.97**
MP1	35.2 dBA	25.1 dBA	Distant traffic, distant plane, wind turbines barely audible
MP2	39.0 dBA	30.2 dBA	Birds, wind turbines barely audible, tractor distant loading/unloading Birds,
MP3	41.0 dBA	28.0 dBA	distant traffic, wind
MP4	35.0 dBA	28.9 dBA	Birds, distant traffic, wind, distant airplane
MP5	35.4 dBA	25.4 dBA	Birds, wind, distant traffic
MP6	40.0 dBA	31.8 dBA	Birds, highway traffic
MP7	42.6 dBA	37.7 dBA	Birds, distant traffic, paused for local traffic
MP8	47.7 dBA	27.9 dBA	Owl, birds, distant high speed traffic, woman speaking (very end) Birds
MP9	33.2 dBA	24.4 dBA	Birds, dog barking, distant high speed traffic
MP10	35.0 dBA	27.1 dBA	High speed car passing
MP11	69.1 dBA	28.1 dBA	Farm equipment, cows
MP12	40.6 dBA	29.4 dBA	Birds, one car passing
MP13	59.5 dBA	28.4 dBA	Distant constant high speed traffic, birds
MP14	35.1 dBA	28.9 dBA	Birds, distant high speed traffic
MP15	35.0 dBA	29.3 dBA	Distant birds, distant high speed traffic
MP16	35.0 dBA	28.8 dBA	

APPENDIX B - SITE LAYOUT AND RECEIVER LOCATIONS



LEGEND

- County Boundary
- Wind Turbine
- Receptor

REFERENCE

0 1 2 MILES

0 1 2 KILOMETERS

N

PREVAILING WIND PARK

Project Site Layout

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	04/25/2018

BURNS McDONNELL

www.burnsmcd.com

Path: \\bmcd\dfs\Clients\BTS\SPowerDC\105644_PrvWindStudies\Studies\Geospatial\DataFiles\ArcDocs\105644_PrevailingWinds_85x11P.mxd • Coordinate System: NAD 1983 UTM Zone 14N • Units: Meter

APPENDIX C - MODELING RESULTS

Appendix C - Modeling Results

GE 3.8-137, 110 m

Receiver	Coordinates Easting (m)	Coordinates Northing (m)	Base Elevation (m)	Modeled LAeq	Limit Value	Exceed? (Y/N)
REC-001	583178.93	4781949.36	473.94	24.7	45	N
REC-002	578731.00	4782428.97	540.99	29.1	45	N
REC-003	580506.89	4783273.92	505.27	33.7	45	N
REC-004	582678.66	4780104.52	480.03	32.4	45	N
REC-005	583326.78	4778396.84	476.81	27.5	45	N
REC-006	583615.28	4778695.43	471.94	26.2	45	N
REC-007	579386.45	4783171.84	519.65	29.7	45	N
REC-008	579364.54	4780122.78	515.18	38.2	45	N
REC-009	582485.70	4779597.03	481.47	34.3	45	N
REC-010	570706.40	4779232.69	531.85	20.3	45	N
REC-011	568954.92	4779049.93	516.88	23.0	45	N
REC-012	575450.96	4778869.67	571.47	-	45	N
REC-013	570834.43	4777923.92	539.22	27.4	45	N
REC-014	578568.31	4777265.47	526.35	38.1	45	N
REC-015	578578.94	4777228.45	526.13	38.3	45	N
REC-016	569437.95	4774776.35	523.53	38.9	45	N
REC-017	567999.72	4773683.50	489.60	36.8	45	N
REC-018	575893.85	4773069.05	525.25	32.5	45	N
REC-019	568870.35	4772837.61	510.51	36.3	45	N
REC-020	568170.58	4772373.09	491.63	30.5	45	N
REC-021	574122.73	4771641.66	507.46	35.0	45	N
REC-022	574117.98	4771913.43	508.31	34.7	45	N
REC-023	567115.19	4771132.04	470.89	-	45	N
REC-024	569455.79	4770885.60	499.55	34.2	45	N
REC-025	582409.59	4770691.28	486.10	26.3	45	N
REC-026	582205.90	4770538.43	489.18	27.7	45	N
REC-027	569450.78	4770122.57	499.25	32.0	45	N
REC-028	578915.96	4770106.59	519.65	30.5	45	N
REC-029	567890.47	4769896.98	472.42	19.1	45	N
REC-030	574057.84	4769738.20	530.58	35.9	45	N
REC-031	571038.40	4769099.63	510.51	36.6	45	N
REC-032	579594.58	4768433.69	507.46	40.2	45	N
REC-033	574388.42	4768112.11	502.26	29.5	45	N
REC-034	575856.91	4767968.51	509.35	34.3	45	N
REC-035	568988.11	4768088.17	487.50	27.6	45	N
REC-036	574139.54	4767903.27	507.06	28.6	45	N
REC-037	580534.75	4767955.77	497.42	40.6	45	N
REC-038	569570.52	4767693.73	493.87	33.1	45	N
REC-039	575753.59	4767511.52	511.25	33.5	45	N
REC-040	575853.92	4767408.85	513.56	34.3	45	N
REC-041	577365.54	4767429.45	496.85	41.4	45	N
REC-042	580534.93	4768649.62	501.93	40.0	45	N
REC-043	582314.18	4767105.01	476.98	30.8	45	N
REC-044	577581.91	4766535.38	501.37	35.6	45	N
REC-045	580459.53	4766528.35	495.27	37.9	45	N
REC-046	570892.00	4766384.10	500.34	39.9	45	N
REC-047	576071.91	4766099.10	511.58	28.5	45	N
REC-048	575888.47	4765484.03	507.46	26.2	45	N
REC-049	579136.06	4765003.57	501.37	36.3	45	N
REC-050	575594.26	4764877.78	513.56	22.9	45	N
REC-051	577014.96	4764806.12	483.08	32.6	45	N
REC-052	571034.71	4764976.49	483.08	32.4	45	N
REC-053	575751.76	4763553.72	504.89	18.1	45	N
REC-054	579261.02	4763508.83	493.92	26.2	45	N
REC-055	575738.19	4763383.18	501.37	18.7	45	N

Appendix C - Modeling Results

GE 3.8-137, 110 m

	Coordinates			Modeled		Exceed?
Receiver	Easting (m)	Northing (m)	Base Elevation (m)	LAeq	Limit Value	(Y/N)
REC-056	578784.40	4763423.45	495.27	26.8	45	N
REC-057	575728.70	4763020.56	496.19	-	45	N
REC-058	574689.98	4762905.51	489.18	-	45	N
REC-059	574608.88	4762765.31	484.23	-	45	N
REC-060	575719.36	4763758.78	507.46	19.6	45	N
REC-061	566590.17	4774005.26	470.89	25.5	45	N
REC-062	566794.52	4771446.01	467.84	-	45	N
REC-063	567575.59	4773523.26	480.49	32.1	45	N
REC-064	568169.85	4775221.75	493.83	37.5	45	N
REC-065	568402.45	4770548.21	483.08	24.8	45	N
REC-066	569474.73	4776605.15	525.75	39.0	45	N
REC-067	569782.41	4765373.88	493.98	36.1	45	N
REC-068	570301.18	4776152.11	533.82	35.8	45	N
REC-069	570320.63	4776086.07	530.62	36.0	45	N
REC-070	570930.65	4767169.47	502.79	37.7	45	N
REC-071	571246.87	4765598.42	488.81	38.5	45	N
REC-072	571847.73	4767001.23	507.46	41.7	45	N
REC-073	572712.41	4764371.30	476.98	25.2	45	N
REC-074	572760.45	4768609.65	494.96	35.3	45	N
REC-075	572875.14	4775183.93	528.80	39.1	45	N
REC-076	573023.77	4775137.74	528.80	39.6	45	N
REC-077	573104.39	4767558.79	488.61	31.1	45	N
REC-078	572689.83	4764269.58	472.84	24.7	45	N
REC-079	572840.24	4766532.05	483.08	35.8	45	N
REC-080	574527.24	4771635.20	508.86	34.0	45	N
REC-081	574606.23	4772084.46	513.56	34.0	45	N
REC-082	575265.41	4775117.32	552.59	41.9	45	N
REC-083	575384.42	4771695.61	513.56	32.3	45	N
REC-084	575459.57	4773771.95	533.47	39.2	45	N
REC-085	576210.31	4770611.18	524.57	38.1	45	N
REC-086	576537.52	4765598.06	498.89	30.2	45	N
REC-087	576971.43	4770447.24	531.85	40.8	45	N
REC-088	577659.69	4765661.22	489.18	38.1	45	N
REC-089	577747.37	4768859.92	513.80	40.5	45	N
REC-090	577878.24	4764078.53	490.80	32.8	45	N
REC-091	577915.85	4763844.06	489.18	30.5	45	N
REC-092	578531.67	4767119.28	501.56	37.6	45	N
REC-093	578575.67	4778618.52	525.75	36.7	45	N
REC-094	578514.65	4776677.36	519.65	37.9	45	N
REC-095	578804.05	4764274.93	501.37	32.8	45	N
REC-096	578827.98	4768793.31	520.74	37.4	45	N
REC-097	578943.49	4770454.51	519.65	29.0	45	N
REC-098	579475.34	4767289.07	507.32	40.3	45	N
REC-099	579720.64	4762441.83	480.38	-	45	N
REC-100	580720.17	4765706.10	489.18	32.2	45	N
REC-101	580991.94	4762540.89	476.98	-	45	N
REC-102	581560.41	4763175.20	470.14	-	45	N
REC-103	581721.12	4767420.32	484.05	35.9	45	N
REC-104	581794.35	4770381.50	494.21	30.1	45	N
REC-105	581890.50	4769063.10	495.27	40.1	45	N
REC-106	581882.94	4766984.50	478.66	32.1	45	N
REC-107	582089.90	4770568.08	488.75	27.9	45	N
REC-108	582148.44	4764102.27	470.89	-	45	N
REC-109	582609.65	4767582.94	483.08	31.6	45	N
REC-110	583963.39	4770430.23	460.42	18.2	45	N

Appendix C - Modeling Results

GE 3.8-137, 110 m

Receiver	Coordinates Easting (m)	Northing (m)	Base Elevation (m)	Modeled LAeq	Limit Value	Exceed? (Y/N)
REC-111	582577.80	4767332.36	480.99	30.7	45	N
REC-112	570034.28	4777428.88	531.85	33.7	45	N
REC-113	580225.65	4778670.25	516.61	41.3	45	N
REC-114	580643.69	4779065.86	510.51	40.5	45	N
REC-115	580812.98	4776797.89	507.54	39.5	45	N
REC-116	581676.22	4775653.66	495.49	37.4	45	N
REC-117	579367.75	4775404.23	525.75	36.8	45	N
REC-118	580095.28	4784336.60	507.46	25.3	45	N
REC-119	581867.73	4783246.46	489.52	29.7	45	N
REC-120	582410.57	4781467.20	486.13	30.9	45	N
REC-121	582256.16	4783054.99	483.20	28.4	45	N
REC-122	582261.38	4777793.15	487.45	33.8	45	N
REC-123	581460.71	4785645.95	483.97	-	45	N
REC-124	577505.30	4781336.06	557.16	19.3	45	N
REC-125	580995.88	4773976.31	501.99	29.4	45	N
REC-126	580915.69	4774830.29	502.29	38.6	45	N
REC-127	581473.61	4775075.61	495.27	37.0	45	N
REC-128	581468.21	4774997.26	495.27	36.4	45	N
REC-129	576815.58	4779814.18	556.23	21.4	45	N
REC-130	567502.00	4781060.00	502.37	-	45	N
REC-131	568850.00	4781446.00	523.04	-	45	N
REC-132	570408.00	4783811.00	527.44	-	45	N
REC-133	570806.00	4783497.00	538.25	-	45	N
REC-134	570845.00	4782153.00	543.29	-	45	N
REC-135	573665.00	4780153.00	564.37	-	45	N
REC-136	579049.00	4772150.00	519.65	-	45	N
REC-137	579104.00	4772978.00	519.65	17.9	45	N
REC-138	573105.45	4772224.12	513.56	37.1	45	N

"-" represents no expected impacts at the receiver location

Appendix C - Modeling Results

Vestas V136-3.6, 105 m

Receiver	Coordinates Easting (m)	Coordinates Northing (m)	Base Elevation (m)	Modeled LAeq	Limit Value	Exceed? (Y/N)
REC-001	583178.93	4781949.36	473.94	26.2	45	N
REC-002	578731.00	4782428.97	540.99	30.6	45	N
REC-003	580506.89	4783273.92	505.27	35.3	45	N
REC-004	582678.66	4780104.52	480.03	33.9	45	N
REC-005	583326.78	4778396.84	476.81	29.0	45	N
REC-006	583615.28	4778695.43	471.94	27.6	45	N
REC-007	579386.45	4783171.84	519.65	31.2	45	N
REC-008	579364.54	4780122.78	515.18	39.7	45	N
REC-009	582485.70	4779597.03	481.47	35.8	45	N
REC-010	570706.40	4779232.69	531.85	21.7	45	N
REC-011	568954.92	4779049.93	516.88	24.2	45	N
REC-012	575450.96	4778869.67	571.47	-	45	N
REC-013	570834.43	4777923.92	539.22	28.8	45	N
REC-014	578568.31	4777265.47	526.35	39.5	45	N
REC-015	578578.94	4777228.45	526.13	39.7	45	N
REC-016	569437.95	4774776.35	523.53	40.4	45	N
REC-017	567999.72	4773683.50	489.60	38.3	45	N
REC-018	575893.85	4773069.05	525.25	34.0	45	N
REC-019	568870.35	4772837.61	510.51	37.8	45	N
REC-020	568170.58	4772373.09	491.63	32.0	45	N
REC-021	574122.73	4771641.66	507.46	36.5	45	N
REC-022	574117.98	4771913.43	508.31	36.2	45	N
REC-023	567115.19	4771132.04	470.89	-	45	N
REC-024	569455.79	4770885.60	499.55	35.7	45	N
REC-025	582409.59	4770691.28	486.10	27.7	45	N
REC-026	582205.90	4770538.43	489.18	29.2	45	N
REC-027	569450.78	4770122.57	499.25	33.5	45	N
REC-028	578915.96	4770106.59	519.65	32.0	45	N
REC-029	567890.47	4769896.98	472.42	20.5	45	N
REC-030	574057.84	4769738.20	530.58	37.4	45	N
REC-031	571038.40	4769099.63	510.51	38.1	45	N
REC-032	579594.58	4768433.69	507.46	41.7	45	N
REC-033	574388.42	4768112.11	502.26	31.0	45	N
REC-034	575856.91	4767968.51	509.35	35.8	45	N
REC-035	568988.11	4768088.17	487.50	29.1	45	N
REC-036	574139.54	4767903.27	507.06	30.0	45	N
REC-037	580534.75	4767955.77	497.42	42.1	45	N
REC-038	569570.52	4767693.73	493.87	34.6	45	N
REC-039	575753.59	4767511.52	511.25	35.0	45	N
REC-040	575853.92	4767408.85	513.56	35.8	45	N
REC-041	577365.54	4767429.45	496.85	42.9	45	N
REC-042	580534.93	4768649.62	501.93	41.5	45	N
REC-043	582314.18	4767105.01	476.98	32.3	45	N
REC-044	577581.91	4766535.38	501.37	37.2	45	N
REC-045	580459.53	4766528.35	495.27	39.4	45	N
REC-046	570892.00	4766384.10	500.34	41.4	45	N
REC-047	576071.91	4766099.10	511.58	30.0	45	N
REC-048	575888.47	4765484.03	507.46	27.6	45	N
REC-049	579136.06	4765003.57	501.37	37.8	45	N
REC-050	575594.26	4764877.78	513.56	24.3	45	N
REC-051	577014.96	4764806.12	483.08	34.1	45	N
REC-052	571034.71	4764976.49	483.08	33.9	45	N
REC-053	575751.76	4763553.72	504.89	19.6	45	N
REC-054	579261.02	4763508.83	493.92	27.7	45	N
REC-055	575738.19	4763383.18	501.37	20.1	45	N

Appendix C - Modeling Results

Vestas V136-3.6, 105 m

Receiver	Coordinates Easting (m)	Northing (m)	Base Elevation (m)	Modeled LAeq	Limit Value	Exceed? (Y/N)
REC-056	578784.40	4763423.45	495.27	28.2	45	N
REC-057	575728.70	4763020.56	496.19	-	45	N
REC-058	574689.98	4762905.51	489.18	-	45	N
REC-059	574608.88	4762765.31	484.23	-	45	N
REC-060	575719.36	4763758.78	507.46	21.1	45	N
REC-061	566590.17	4774005.26	470.89	26.9	45	N
REC-062	566794.52	4771446.01	467.84	-	45	N
REC-063	567575.59	4773523.26	480.49	33.6	45	N
REC-064	568169.85	4775221.75	493.83	39.0	45	N
REC-065	568402.45	4770548.21	483.08	26.2	45	N
REC-066	569474.73	4776605.15	525.75	40.5	45	N
REC-067	569782.41	4765373.88	493.98	37.5	45	N
REC-068	570301.18	4776152.11	533.82	37.4	45	N
REC-069	570320.63	4776086.07	530.62	37.5	45	N
REC-070	570930.65	4767169.47	502.79	39.2	45	N
REC-071	571246.87	4765598.42	488.81	40.0	45	N
REC-072	571847.73	4767001.23	507.46	43.2	45	N
REC-073	572712.41	4764371.30	476.98	26.7	45	N
REC-074	572760.45	4768609.65	494.96	36.8	45	N
REC-075	572875.14	4775183.93	528.80	40.6	45	N
REC-076	573023.77	4775137.74	528.80	41.1	45	N
REC-077	573104.39	4767558.79	488.61	32.6	45	N
REC-078	572689.83	4764269.58	472.84	26.2	45	N
REC-079	572840.24	4766532.05	483.08	37.3	45	N
REC-080	574527.24	4771635.20	508.86	35.6	45	N
REC-081	574606.23	4772084.46	513.56	35.5	45	N
REC-082	575265.41	4775117.32	552.59	43.3	45	N
REC-083	575384.42	4771695.61	513.56	33.8	45	N
REC-084	575459.57	4773771.95	533.47	40.7	45	N
REC-085	576210.31	4770611.18	524.57	39.6	45	N
REC-086	576537.52	4765598.06	498.89	31.7	45	N
REC-087	576971.43	4770447.24	531.85	42.3	45	N
REC-088	577659.69	4765661.22	489.18	39.6	45	N
REC-089	577747.37	4768859.92	513.80	42.0	45	N
REC-090	577878.24	4764078.53	490.80	34.3	45	N
REC-091	577915.85	4763844.06	489.18	32.0	45	N
REC-092	578531.67	4767119.28	501.56	39.1	45	N
REC-093	578575.67	4778618.52	525.75	38.2	45	N
REC-094	578514.65	4776677.36	519.65	39.4	45	N
REC-095	578804.05	4764274.93	501.37	34.3	45	N
REC-096	578827.98	4768793.31	520.74	38.9	45	N
REC-097	578943.49	4770454.51	519.65	30.5	45	N
REC-098	579475.34	4767289.07	507.32	41.8	45	N
REC-099	579720.64	4762441.83	480.38	-	45	N
REC-100	580720.17	4765706.10	489.18	33.7	45	N
REC-101	580991.94	4762540.89	476.98	-	45	N
REC-102	581560.41	4763175.20	470.14	-	45	N
REC-103	581721.12	4767420.32	484.05	37.4	45	N
REC-104	581794.35	4770381.50	494.21	31.6	45	N
REC-105	581890.50	4769063.10	495.27	41.6	45	N
REC-106	581882.94	4766984.50	478.66	33.6	45	N
REC-107	582089.90	4770568.08	488.75	29.4	45	N
REC-108	582148.44	4764102.27	470.89	-	45	N
REC-109	582609.65	4767582.94	483.08	33.1	45	N
REC-110	583963.39	4770430.23	460.42	19.6	45	N

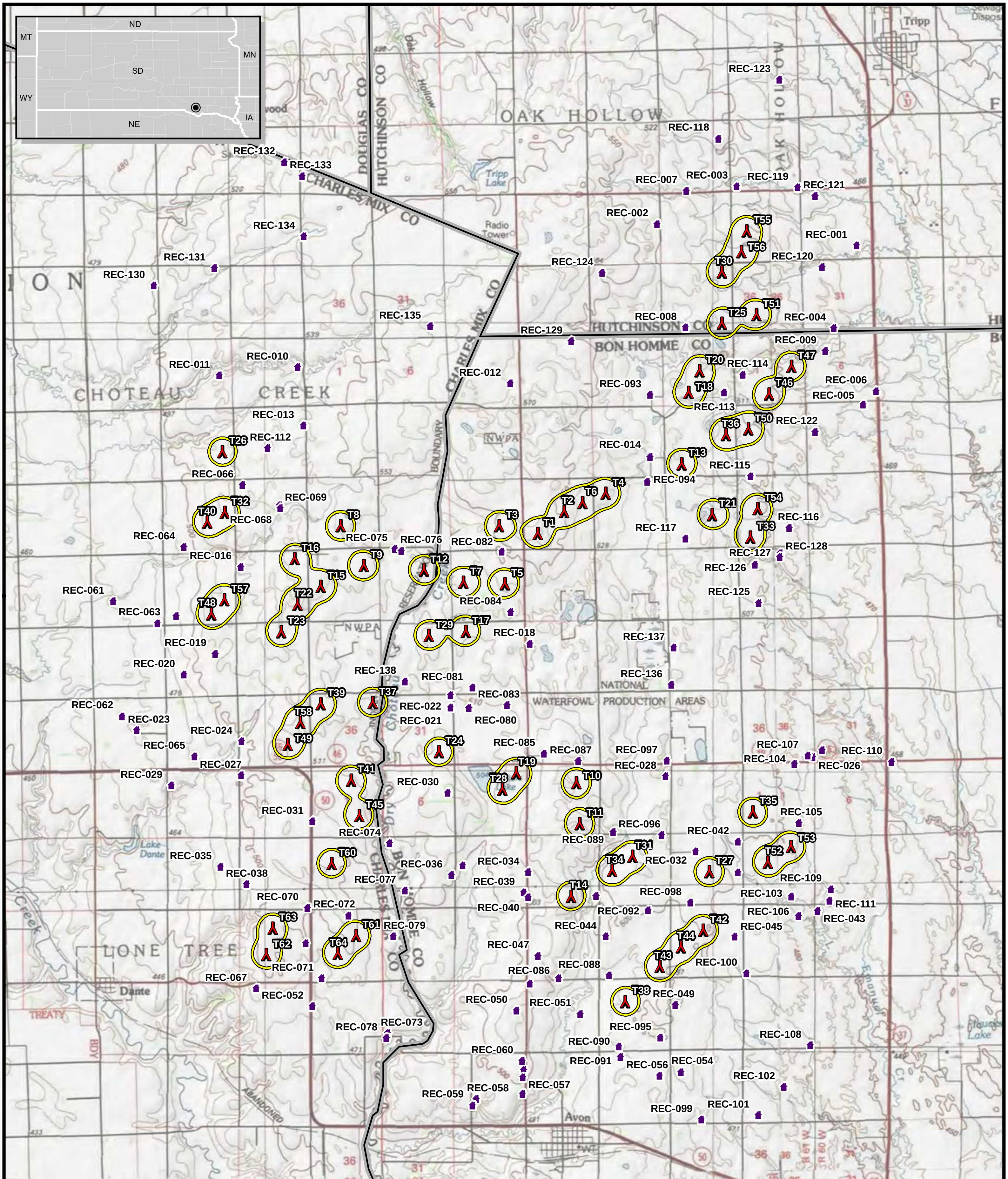
Appendix C - Modeling Results

Vestas V136-3.6, 105 m

Receiver	*Coordinates* Easting (m)	Northing (m)	*Base Elevation (m)*	*Modeled LAeq*	*Limit Value*	*Exceed? (Y/N)*
REC-111	582577.80	4767332.36	480.99	32.2	45	N
REC-112	570034.28	4777428.88	531.85	35.2	45	N
REC-113	580225.65	4778670.25	516.61	42.8	45	N
REC-114	580643.69	4779065.86	510.51	42.0	45	N
REC-115	580812.98	4776797.89	507.54	41.0	45	N
REC-116	581676.22	4775653.66	495.49	38.9	45	N
REC-117	579367.75	4775404.23	525.75	38.3	45	N
REC-118	580095.28	4784336.60	507.46	26.7	45	N
REC-119	581867.73	4783246.46	489.52	31.2	45	N
REC-120	582410.57	4781467.20	486.13	32.4	45	N
REC-121	582256.16	4783054.99	483.20	29.9	45	N
REC-122	582261.38	4777793.15	487.45	35.3	45	N
REC-123	581460.71	4785645.95	483.97	-	45	N
REC-124	577505.30	4781336.06	557.16	20.8	45	N
REC-125	580995.88	4773976.31	501.99	30.9	45	N
REC-126	580915.69	4774830.29	502.29	40.0	45	N
REC-127	581473.61	4775075.61	495.27	38.5	45	N
REC-128	581468.21	4774997.26	495.27	37.9	45	N
REC-129	576815.58	4779814.18	556.23	22.8	45	N
REC-130	567502.00	4781060.00	502.37	-	45	N
REC-131	568850.00	4781446.00	523.04	-	45	N
REC-132	570408.00	4783811.00	527.44	-	45	N
REC-133	570806.00	4783497.00	538.25	-	45	N
REC-134	570845.00	4782153.00	543.29	-	45	N
REC-135	573665.00	4780153.00	564.37	-	45	N
REC-136	579049.00	4772150.00	519.65	-	45	N
REC-137	579104.00	4772978.00	519.65	19.3	45	N
REC-138	573105.45	4772224.12	513.56	38.6	45	N

"-" represents no expected impacts at the receiver location

APPENDIX D - SOUND LEVEL CONTOURS



Path: \\bmcd\dfs\Clients\BTS\SPowerDC\105644_PrvWindStudies\Studies\Geospatial\DataFiles\ArcDocs\105644_PrevailingWinds_85x11P.mxd • Coordinate System: NAD 1983 UTM Zone 14N • Units: Meter

LEGEND

- County Boundary
- Wind Turbine
- Receptor
- 45 dBA Limit, GE 3.8-137

REFERENCE

0 1 2
MILES

0 1 2
KILOMETERS

N

PREVAILING WIND PARK
45 dBA Contours - GE 3.8-137 Layout

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	04/26/2018

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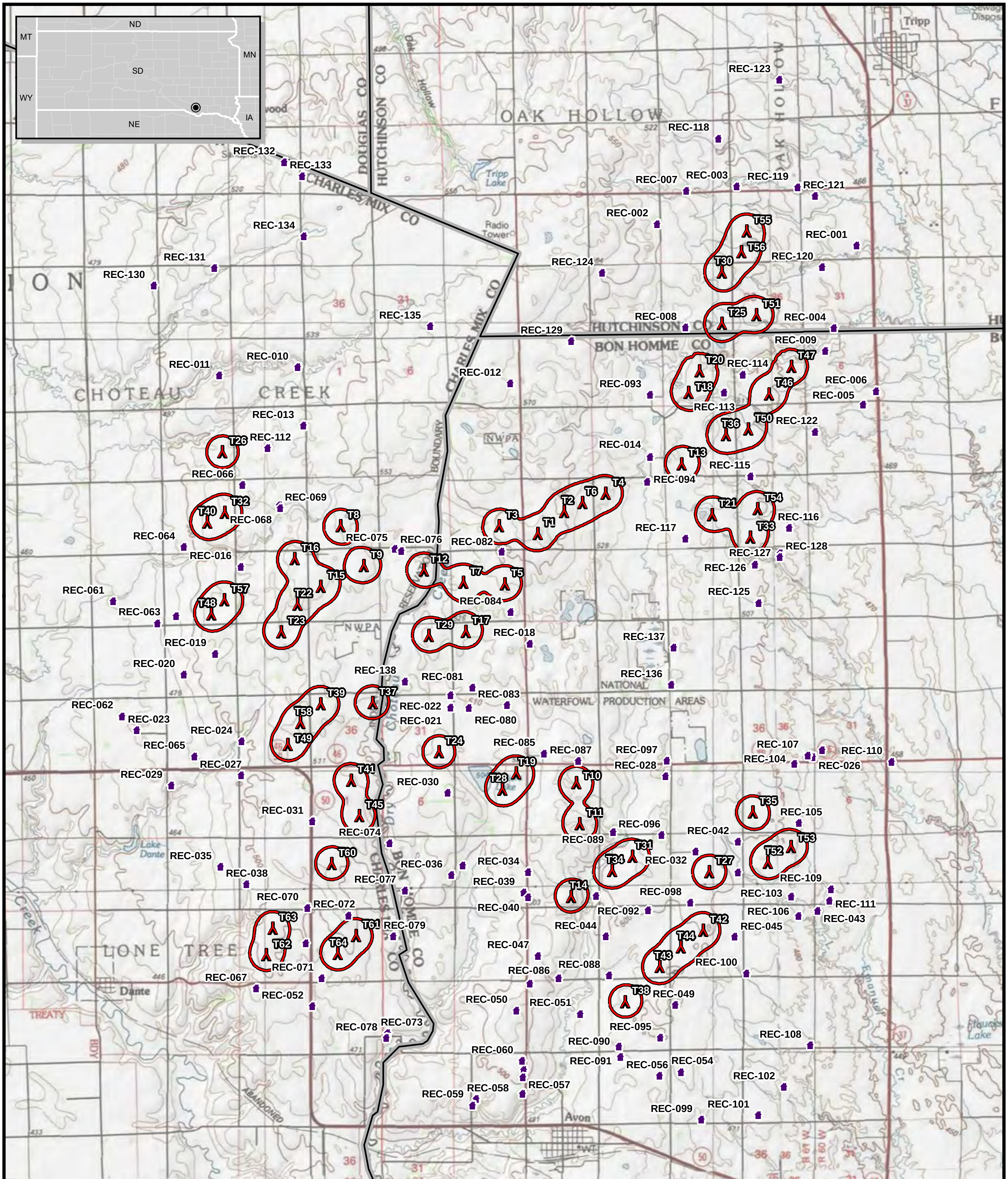

LEGEND

- County Boundary
- Wind Turbine
- Receptor
- 45 dBA Limit, Vestas V136-3.6

REFERENCE

0 1 2
MILES

0 1 2
KILOMETERS

N

PREVAILING WIND PARK
45 dBA Contours - Vestas V136-3.6 Layout

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	04/26/2018

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Path: \\bmcd\dfs\Clients\BTS\PowerDC\105644_PrvWindStudies\Studies\Geospatial\DataFiles\ArcDocs\105644_PrevailingWinds_85x11P.mxd • Coordinate System: NAD 1983 UTM Zone 14N • Units: Meter

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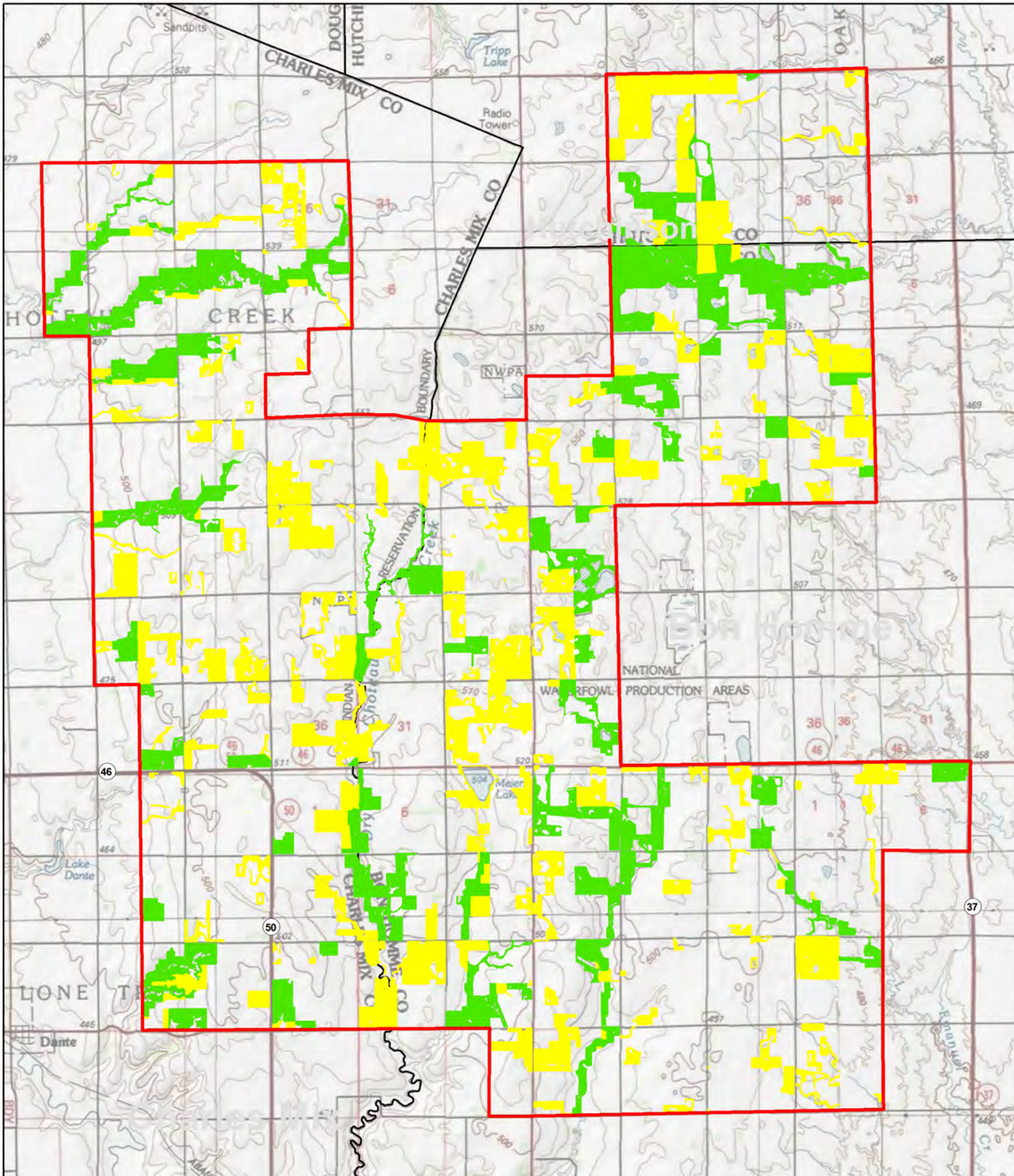
APPENDIX C - GRASSLAND ANALYSIS



Prevailing Winds Wind Project

Digitized Grasslands

Data Source: ESRI USA Topo Maps 2-13
Coordinate System: NAD83, UTM, zn14 n
Map produced on 04/25/2017 by T. Thorn

0 1 2 mi
0 1 2 km

Map Features

Project Boundary

Grasslands

Tilled

Untilled

N W E S

WEST

APPENDIX D - TIERS 1 AND 2 WILDLIFE REPORT

Tiers 1 and 2 Report
for the Prevailing Winds Wind Project
Bon Homme and Charles Mix
Counties, South Dakota

Prepared for:

Prevailing Winds, LLC

101 Second Street West
P.O. Box 321
Chokio, Minnesota 56221

Prepared by:

Sarah Hamilton and Clayton Derby

Western EcoSystems Technology, Inc.
4007 State Street, Suite 109
Bismarck, North Dakota 58503

June 1, 2016

EXECUTIVE SUMMARY

The Prevailing Winds Wind Project (Project) is located in Bonne Homme and Charles Mix counties, South Dakota. The purpose of this report is to: 1) characterize biological resources throughout the proposed Project as well as identify the needs and timing of recommended future studies based on the species of concern, and 2) to summarize the results of Tier 1 and Tier 2 studies. The Project area was evaluated during a February 2015 visit.

The majority of the Project is located in the Southern Missouri Coteau Slope, while a small portion is located in the Southern Missouri Coteau Level IV Ecoregions. Historically, the Project and surrounding area was mixed grass prairie consisting of grama, needlegrass, and wheatgrass species, with numerous wetlands scattered throughout. Today, the majority of the Project has been converted to agricultural use with crop production and livestock grazing as the main agricultural practices. There are trees and woodlands found mainly in planted shelter belts and within draws and on hillslopes. Wetlands are scattered throughout the Project.

One of the main concerns regarding impacts from wind energy facilities in South Dakota is development in native grasslands and other native prairie habitats and displacement of wildlife from these areas. Approximately 45% of the Project is categorized as grassland (grass/herbaceous/pasture/hay). Because the Project includes grasslands (native or planted), it is possible that some grassland-dependent wildlife species may be displaced. The magnitude and significance of the displacement will depend on the affected species and the plan for development of the site.

Based on National Wetland Inventory (NWI) data, there are approximately 1,305.8 acres (528.8 hectares) of wetlands found within the Project. Freshwater emergent wetlands (77.5%) accounted for the majority of the wetlands, followed by freshwater ponds (14.7%), lakes (4.4%), and freshwater forested/shrub wetlands (3.4%).

Seven animal species listed as threatened, endangered, or proposed endangered under the federal Endangered Species Act have been documented in Bonne Homme and/or Charles Mix counties, including: pallid sturgeon, Topeka shiner, interior least tern, whooping crane, northern long-eared bat, red knot, and piping plover. Five of these species have the potential to occur in the Project during some portion of the year: interior least tern, whooping crane, northern long-eared bat, red knot, and piping plover. 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. The Project is located outside of the defined national whooping crane migration corridor, and there have been no confirmed whooping crane sightings within the Project as of fall 2010. The Project is with the defined range of the northern long-eared bat, and while unlikely, the species could be present during the summer breeding period. The pallid sturgeon and Topeka shiner are federally-listed fish species, but have not been found within the Project. There are no known occurrences of federally-listed plant species within the Project.

Western EcoSystems Technology, Inc. (WEST) conducted a preliminary review of the birds and bats listed as threatened or endangered by the state of South Dakota, as birds and bats are most likely impacted by wind facility development. WEST identified two bird species, bald eagle and osprey, that are listed as threatened by the state of South Dakota that may occur within the Project. Bald eagles are also protected under the Bald and Golden Eagle Protection Act.

The following diurnal raptor and vulture species could potentially breed in or near the Project: American kestrel, bald eagle, golden eagle, Cooper's hawk, northern harrier, red-tailed hawk, Swainson's hawk, ferruginous hawk, broad-winged hawk, peregrine falcon, osprey, and turkey vulture. Owls with the potential to breed in or near the Project include barn owl, burrowing owl, eastern screech owl, long-eared owl, short-eared owl, and great horned owl. Diurnal raptor species that may also occur within the Project outside of the breeding season (migration, winter, or post-breeding dispersal) include northern goshawk, Cooper's hawk, red-tailed hawk, golden eagle, bald eagle, merlin, peregrine falcon, prairie falcon, gyrfalcon, rough-legged hawk, and sharp-shinned hawk. Four red-tailed hawk and two unidentified raptor observations were recorded at the Project during the site visit in February 2015. Potential nest structures for above ground nesting species were present in the form of living and dead trees; grassland areas could also provide nesting habitats for ground-nesting raptors and owls, such as the northern harrier and burrowing owl.

Colonial rodents are known to attract feeding raptors but were not observed during the site visit. It is likely that some bird species migrate through the proposed Project, including passerines, raptors, and waterfowl. Harvested crop fields located in the Project could serve as feeding areas for migrating birds. During the site visit, approximately 70 mallards were seen throughout the area and feeding in crop fields.

Two US Geological Survey (USGS) Breeding Bird Survey (BBS) routes are located in the vicinity of the Project. The Tripp BBS route is approximately 13 miles (20.9 kilometers [km]) northeast of the Project, and the Sparta BBS route is approximately 21.5 miles (34.6 km) southeast of the Project. Seventy bird species have been recorded along the Tripp BBS route from 2011 to 2014, of which three are considered Species of Conservation Concern by the US Fish and Wildlife Service (USFWS): dickcissel, grasshopper sparrow, and red-headed woodpecker. Along the Sparta BBS route, 65 bird species were recorded in 2011 and 2013, of which four are considered Species of Conservation Concern by the USFWS: dickcissel, grasshopper sparrow, red-headed woodpecker, and upland sandpiper.

Seven bat species are potential residents and/or migrants in the Project, including big brown bat, eastern red bat, hoary bat, silver-haired bat, northern long-eared bat, little brown bat, and western small-footed bat. Potential roosting habitat within the Project is found in the form of scattered trees, wooded hillslopes, and abandoned buildings; no caves were observed during the site visit. No known caves were documented in a literature search; however, karst formations may be found within the Project. Although the operation of the proposed wind energy facility will likely result in the mortality of some bats, the magnitude of these fatalities and the degree to which bat species will be affected is difficult to predict.

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INTRODUCTION

The Prevailing Winds Wind Project (hereafter referred to as Project) is located in Bonne Homme and Charles Mix Counties, South Dakota (Figure 1). Identification of potential biological resource issues early in the development phase of wind energy facilities helps the industry identify, avoid, and minimize future problems. This Tier 1 and 2 report involved a desktop review of publicly available information gathered from a variety of data sources, including US Fish and Wildlife Service (USFWS) websites; South Dakota Game, Fish and Parks (SDGFP) websites; US Geological Survey (USGS) Gap Analysis datasets; and various field guides, maps, and aerial imagery; and non-governmental organization (NGO) websites (e.g., The Nature Conservancy, Audubon, American Wind Wildlife Institute). This report is intended to meet the requirements described in Chapters 2-3 of the USFWS Land-Based Wind Energy Guidelines (USFWS 2012b).

STUDY AREA

The proposed Project (37,016.6 acres [ac]; 14,980.1 hectares [ha]) is located in the southeastern South Dakota counties of Bon Homme and Charles Mix (Figure 1). The landscape of the Project is flat to rolling hills, with elevations ranging from 454.5 to 573.7 meters (m; 1,491.2 to 1,882.3 feet [ft]) above sea level (Figures 2).

The majority of the Project is located in the Southern Missouri Coteau Slope, with the rest of the Project in the Southern Missouri Coteau Level IV Ecoregions (US Environmental Protection Agency [USEPA] 2013). Historically, the Project and surrounding area was mixed grass prairie consisting of grama (*Bouteloua* spp.), needlegrass (*Stipa* spp.), and wheatgrass (*Agropyron* spp.) species with numerous wetlands scattered throughout. Today, the majority of the Project has been converted to agricultural use, with crop production and livestock grazing as the main agricultural practices (Figure 4; USGS National Land Cover Data [NLCD] 2011). There are trees and woodlands found mainly in planted shelter belts and within draws and on hillslopes. Wetlands are scattered throughout the Project.

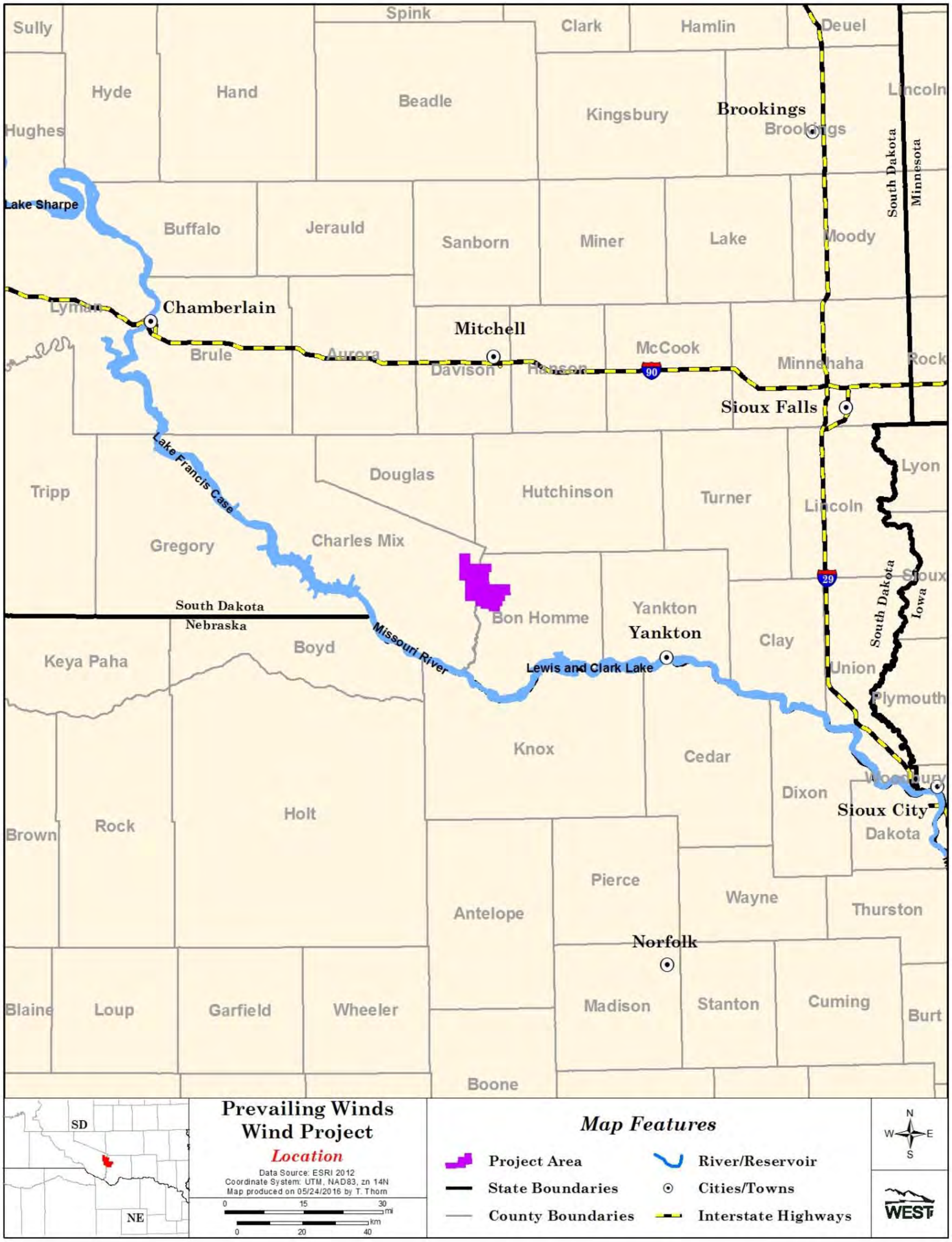

Figure 1. Location of the Prevailing Winds Wind Project.

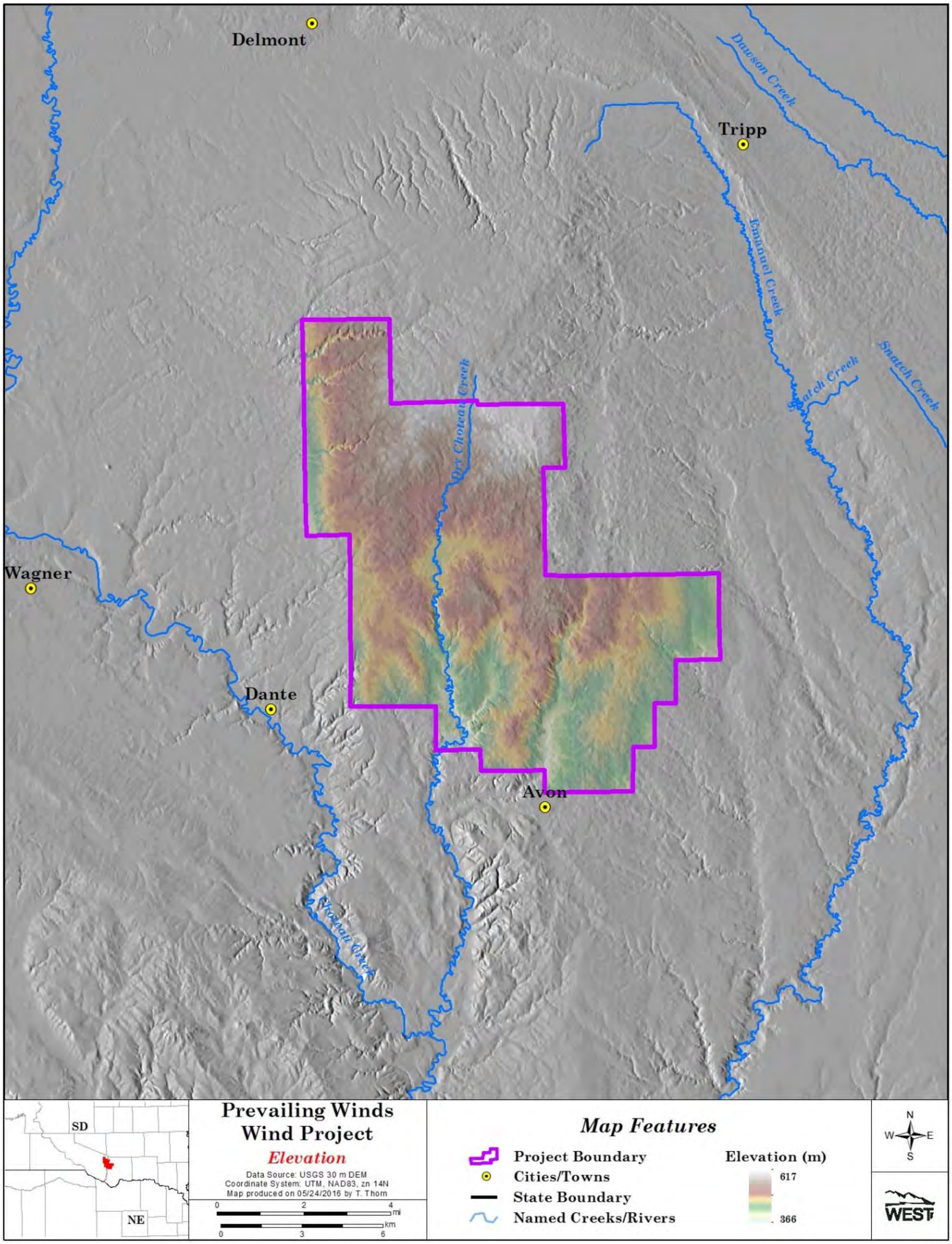

Figure 2. Elevation of the Prevailing Winds Wind Project.

METHODS

Tier 1 and 2 Study

Desktop review of publicly available information was gathered from a variety of data sources; including USFWS websites, SDGFP websites, USGS Gap Analysis datasets, various field guides, maps and aerial imagery, and NGO websites. In addition, biological resources within the Project were evaluated through a site reconnaissance visit conducted from public roads on February 25 and 26, 2015. Biological features and potential wildlife habitat, including plant communities, topographic features, and potential raptor nesting habitat and prey populations, were identified during the site visit. Photographs representative of the Project were also taken (Appendix A). All wildlife species observed were recorded (see Wildlife section below). Information about the presence and locations of sensitive species may be requested from the SDGFP and the USFWS.

Land Use/Land Cover

Approximately 47.5% of the Project is cultivated crops (Table 1, Figure 3; USGS NLCD 2011). The next most common land use is pasture/hay (37.6%). Grassland/herbaceous cover within the Project accounts for 6.7% of the land cover, followed by developed areas (4.3%) and wetlands/open water (2.7%). All other land cover types each account for less than 2% of the Project (Table 1).

Table 1. Land use/land cover within the Prevailing Winds Wind Project.

Land Use/Cover	Project Acres	% Total
Cultivated Crops	17,594.9	47.5
Pasture/Hay	13,901.8	37.6
Grassland/Herbaceous	2,479.6	6.7
Developed	1,575.1	4.3
Wetlands/Open Water	1,013.1	2.7
Deciduous Forest	368.3	1.0
Shrub/Scrub	67.5	0.2
Barren Land	14.7	<0.1
Evergreen Forest	1.1	<0.1
Total	**37,016.1**	**100**

Data Source: USGS NLCD 2011

For overall comparison of Land Use/Cover, the sole data source was USGS NLCD (2011). However, a more refined assessment was conducted by digitizing grasslands (pasture, hay, grassland, and herbaceous land cover) in ArcGIS 10.3 using 2014 National Agriculture Imagery Program (NAIP) aerial imagery. This method determined grassland acreage within the Project to be 9,949.97 acres (4,026.61 ha; 26.9%) in 2014, while USGS NLCD (2011) reported 16,381.40 acres (6,629.32 ha), indicating there has been a reduction in grassland in the Project since 2011.

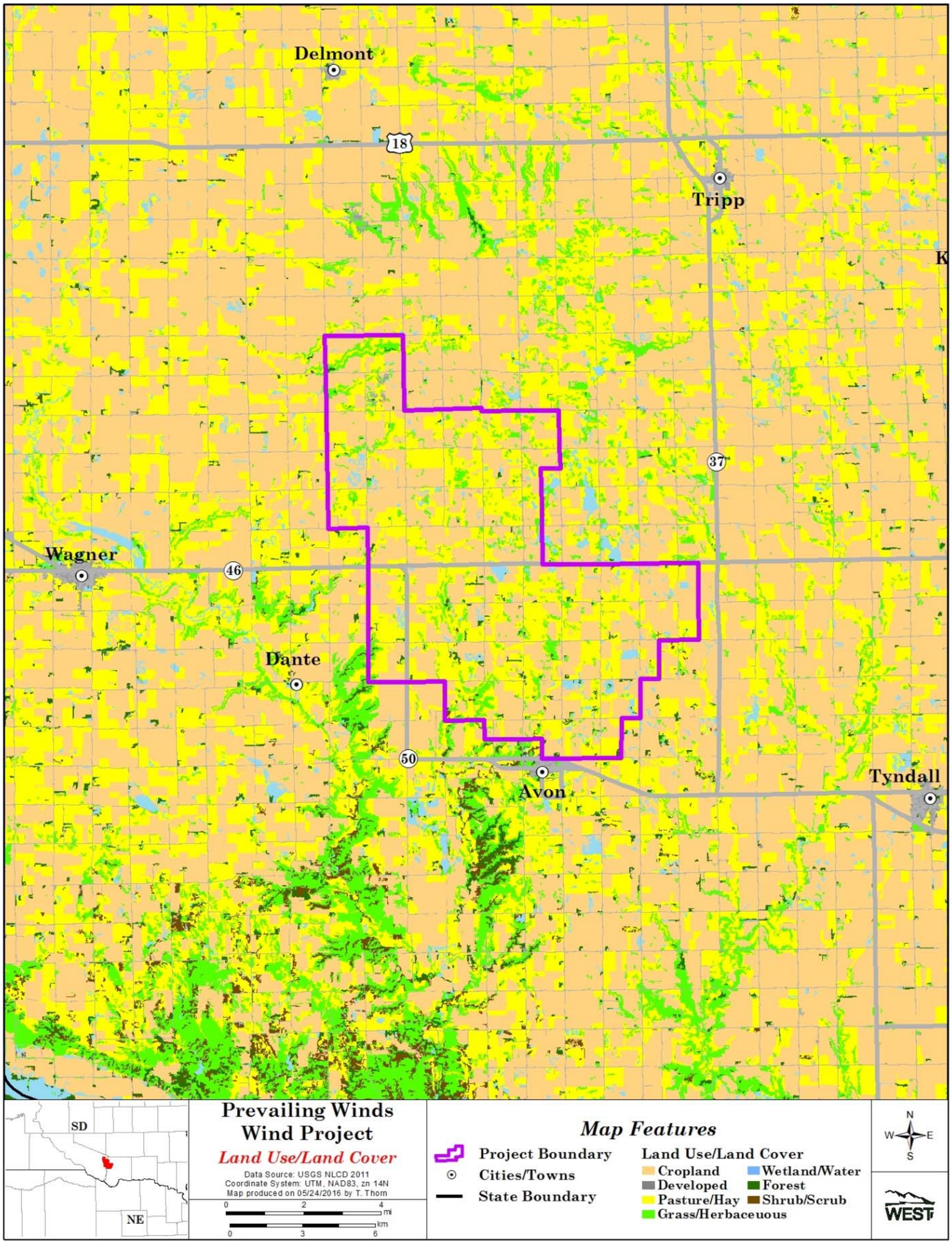

Figure 3. Land Use/Land Cover within and around the Prevailing Winds Wind Project.

Sensitive Habitats

Concern has been expressed by the USFWS and SDGFP on all projects in South Dakota regarding the potential impacts development of the Project may have on grasslands, particularly native grasslands and the impact to nesting grassland birds in these areas. Only 6.7% of the Project's area is categorized as grassland/herbaceous, but another 37.6% of the Project is considered pasture/hay, which may also contain native grass (Table 1, Figure 3; USGS NLCD 2011). If construction takes place within these areas, it is possible that some grassland and/or shrub-dependent species could be displaced (see the Breeding Bird section for more discussion on displacement). Project development is being planned to minimize impacts and disturbances to grasslands.

Wetlands and Riparian Areas

Based on National Wetland Inventory (NWI) data (USFWS NWI 2009), there are approximately 1,305.8 ac (528.8 ha) of wetlands within the Project. Freshwater emergent (77.5%) accounted for the majority of the wetlands, followed by freshwater ponds (14.7%), lakes (4.4%), and freshwater forested/shrub wetlands (3.4%; Table 2, Figure 4). A portion of Dry Choteau Creek is found within the Project. WEST did not conduct wetland delineations for the Project.

Table 2. National Wetland Inventory (NWI) wetlands present within the Prevailing Winds Wind Project (USFWS NWI 2009).

Wetland Type	Project Acres	Percent Total
Freshwater Emergent Wetland	1,011.7	77.5
Freshwater Pond	192.3	14.7
Lake	57.4	4.4
Freshwater Forested/Shrub Wetland	44.4	3.4
Total	**1,305.8**	**100**

Data Source: USFWS NWI 2009

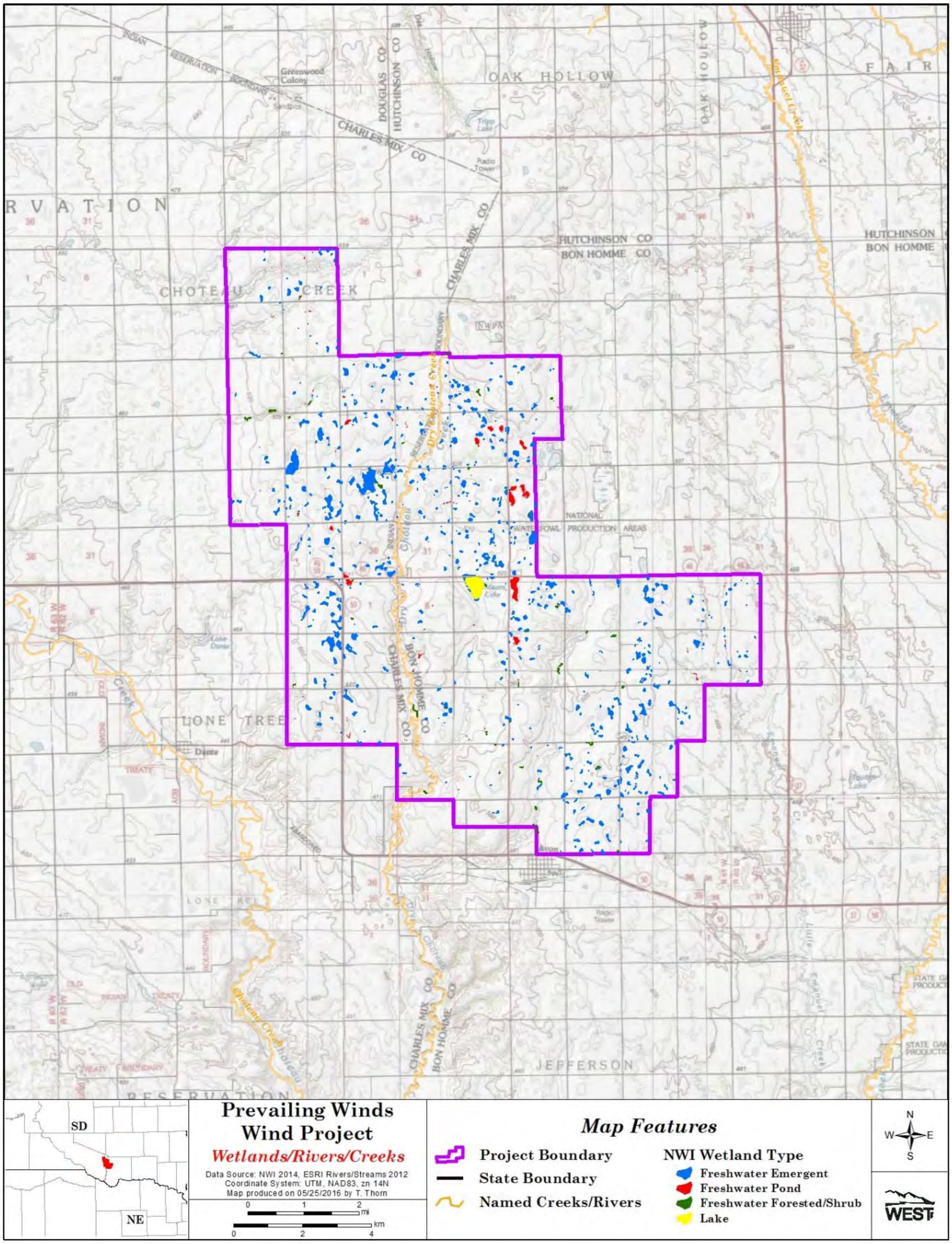

Figure 4. NWI wetlands within and around the Prevailing Winds Wind Project.

Wildlife

Wildlife species associated with croplands, grasslands, and shrublands are the most common types of species observed and expected to occur at the Project. A list of the species observed during the site visit on February 25 and 26, 2015, is provided in Table 3.

Table 3. Wildlife species observed at the Prevailing Winds Wind Project during a site visit on February 25 and 26, 2015.

Common Name	Scientific Name
Birds	
American robin	*Turdus migratorius*
European starling	*Sturnus vulgaris*
horned lark	*Eremophila alpestris*
mallard	*Anas platyrhynchos*
northern flicker	*Colaptes auratus*
red-tailed hawk	*Buteo jamaicensis*
ring-necked pheasant	*Phasianus colchicus*
rock pigeon	*Columba livia*
unidentified raptor	

Federally-Listed Species

A total of seven animal species listed as threatened, endangered, or proposed under the federal Endangered Species Act (ESA 1973) have been documented in Bonne Homme and/or Charles Mix counties (USFWS 2015c). Based on habitats found within the proposed Project during desktop evaluation and the site visit, five of the animal species have the potential to occur in the Project during some portion of the year, including: federally-endangered interior least tern (*Sterna antillarum athalassos*; USFWS 2013c) and whooping crane (*Grus americana*; USFWS 2013), federally-threatened piping plover (*Charadrius melodus*; USFWS 2013e), red knot (*Calidris canutus rufa*; USFWS 2014), and northern long-eared bat (*Myotis septentrionalis*; USFWS 2013b, 2015b). These species are discussed in further detail below.

The pallid sturgeon (*Scaphirhynchus albus*) is a federally-endangered fish species (USFWS 2013d) listed in all counties that are contiguous with the Missouri River. It can be found in the Missouri River, which is located approximately six miles (9.66 kilometers [km]) south of the Project. The federally-endangered Topeka shiner (*Notropis topeka*; USFWS 2013f) is a small minnow native to the streams of the prairie and prefers small, quiet streams with clean gravel or sand substrates and vegetated banks (Shearer 2003). The shiner can be found in the James River and tributaries, which is about 17.1 miles (27.5 km) to the northeast of the Project (SDGFP 2015c). It is unlikely that the pallid sturgeon or Topeka shiner will be affected by the development of and operations associated with a wind facility.

No federally-listed species were observed during the site visit.

Table 4. Species listed as endangered, threatened, or proposed endangered by the US Fish and Wildlife Service (USFWS) with the potential to occur within the Prevailing Winds Wind Project.

Common Name	Scientific Name	Federal Status
Birds		
interior least tern	*Sterna antillarum athalassos*	E
whooping crane	*Grus americana*	E
piping plover	*Charadrius melodus*	T
red knot	*Calidris canutus rufa*	T
Bats		
northern long-eared bat	*Myotis septentrionalis*	PE

E=endangered, T=threatened, PE=Proposed Endangered
Data Source: USFWS 2015c

<u>Interior Least Tern</u>

The interior least tern is a federally-endangered species (USFWS 2013c) that nests along sand and gravel bars within wide, unobstructed river channels and open flats along shorelines of lakes and reservoirs (TPWD 2015). Unnatural water fluctuations, permanent flooding or vegetation coverage of nesting habitat caused by water management may contribute to nest failure. No suitable nesting habitat was identified within the Project, but the least interior tern could potentially nest along the Missouri River or pass through the Project during spring and fall migration.

<u>Whooping Crane</u>

The federally-endangered whooping crane (USFWS 2013) migrates from its breeding grounds in Wood Buffalo National Park, Canada, to its wintering areas in Aransas National Wildlife Refuge, Texas (USFWS 2009). Threats to wild cranes include habitat destruction, chemical spills in its wintering habitat, lead poisoning, collisions with manmade objects such as fences and power lines, disease (e.g., avian cholera and parasites), and shooting (USFWS 2015d). Cranes typically utilize shallow wetlands and marshes, the edges and sandbars of shallow rivers, and agricultural fields near a water source during migration (USFWS 2015d). Thus, suitable whooping crane stopover habitat includes shallow livestock ponds surrounded by agricultural and grassland parcels and freshwater emergent wetlands. Some of these habitat features are scattered throughout the Project. Additionally, the Project is located 2.2 miles (3.5 km) east of the eastern edge of the 220-mile (354.1-km) wide whooping crane migration corridor, based on national flyway information (Figure 6), but it is within the 95% migration corridor when considered specific to South Dakota. Therefore, it is possible but unlikely that whooping cranes could occur in the Project.

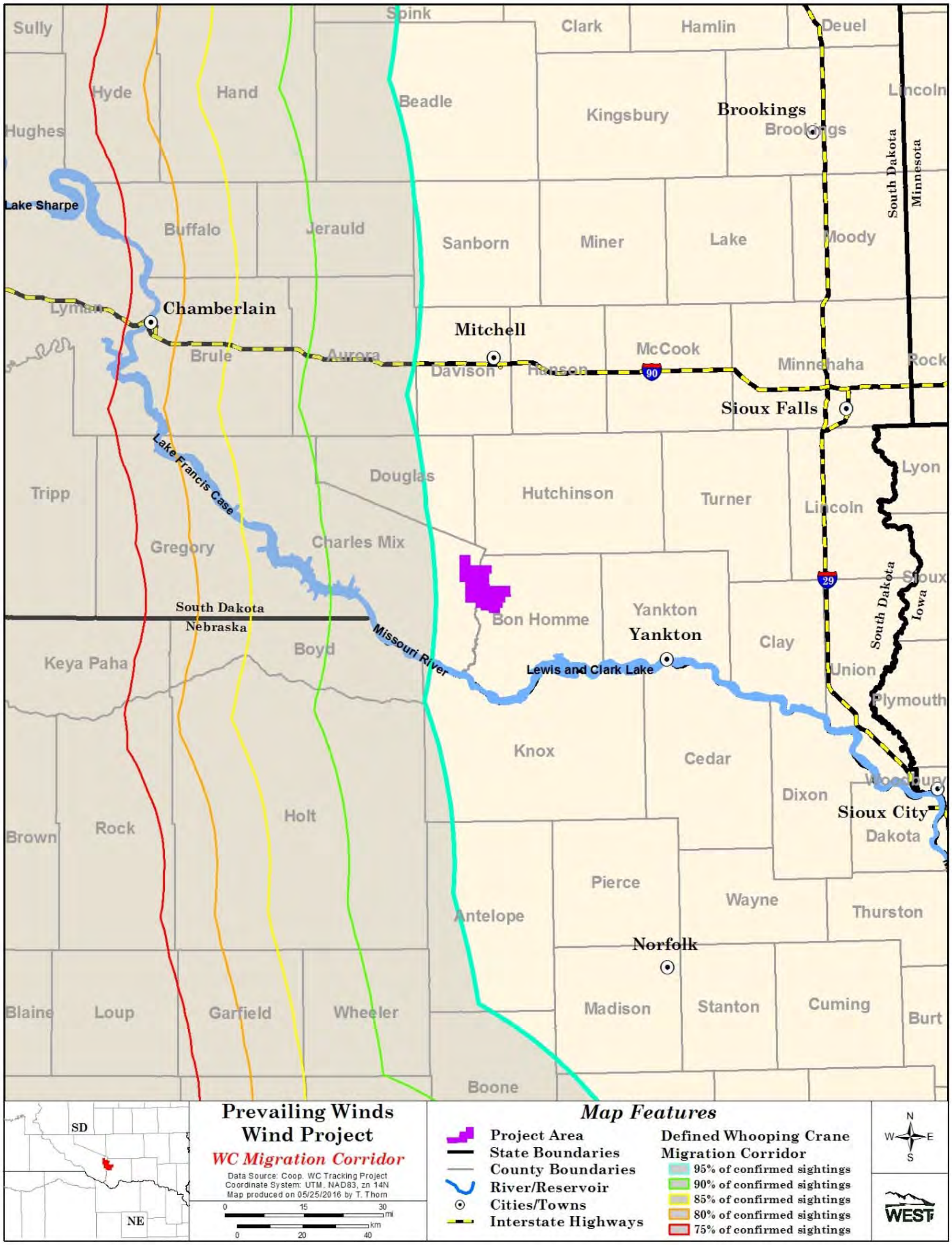

Figure 5. Designated Whooping Crane migration corridor.

Piping Plover

The federally-threatened piping plover (USFWS 2013e) is typically found on sandy beaches, mudflats, and exposed areas around wetlands and lakes. Suitable nesting habitat includes barren sandbars in large river systems and on alkaline lake shores (USFWS 2002). Piping plover populations are threatened by habitat loss due to vegetation encroachment, shoreline development, anthropogenic and animal disturbances, and water management activities, such as dam construction and channelization. Designated critical habitat for the piping plover is located approximately six miles (9.66 km) south of the Project along the Missouri River (Figure 6; USFWS 2015a). No suitable piping plover habitat was observed in the Project during the site visit. Piping plovers are unlikely to breed within the Project, but the species could potentially migrate through the Project.

Red Knot

The federally-threatened red knot is a medium-sized shorebird that migrates from its breeding grounds in Canada's Arctic region to multiple wintering grounds, including the Northeast Gulf of Mexico, the Southeastern US, northern Brazil, and Tierra del Fuego at the southern point of South America. During the breeding season, red knots are typically found in sparsely vegetated, dry tundra areas (Harrington 2001, All About Birds 2015b). Outside of the breeding season, red knots are usually found along intertidal, marine beaches (Harrington 2001). During migration, some red knots can be found flying over inland areas, but these cases are rare (Sibley 2003). The red knot population is threatened by habitat loss in migration and wintering areas, reduction of quality and quantity of food resources, asynchronies in timing throughout its breeding and migration range, and high predation on the breeding grounds every three to four years (USFWS 2014). No suitable red knot habitat was observed in the Project during the site visit. Red knots are unlikely to breed within the Project, but the species could potentially migrate through the Project.

Figure 6. Designated Piping Plover critical habitat.

<u>Northern Long-Eared Bat</u>

The northern long-eared bat was listed as a threatened species on April 2, 2015. It is found in the U.S. from Maine to North Carolina on the Atlantic Coast, westward to eastern Oklahoma and north through part of South Dakota (BCI 2015a). The Project is on the western fringe of the estimated range for the species (BCI 2015a). This species hibernates in caves and abandoned mines during winter (BCI 2015a); however, no known hibernacula exist in the Project, with the closes being in the Black Hills on the South Dakota/Wyoming border. During the summer, individuals may roost alone or in small colonies beneath exfoliating bark, or in cavities or crevices of both live and dead trees (BCI 2015a). Some of these habitat features are located in the Project. Although white-nose syndrome (WNS; caused by the fungus *Pseudogymnoascus destructans*) is the primary threat to northern long-eared bat populations (USFWS 2015b), there is concern about the impacts of wind facilities on bat species. However, under the final 4(d) rule published on January 14, 2016 (USFWS 2016), it was determined that wind-energy development has not led to significant declines in this species, nor is there evidence that regulating the incidental take that is occurring would meaningfully change the conservation or recovery potential of the species in the face of WNS. In other words, take of the species by a wind facility is not currently considered a violation of Section 9 of the ESA. This will change if the species becomes listed as endangered or if the 4(d) rule is rescinded. Bat acoustic surveys will be conducted to determine presence/absence of the northern long-eared bat within the Project.

State-Listed Species

Twelve species listed by the SDGFP as state-threatened or endangered have records of occurrence in the two counties in which the Project is located (SDGFP 2015b, Table 5). Eight of these species (northern river otter [*Lontra Canadensis*], false map turtle [*Graptemys pseudogeographica*], banded killifish [*Fundulus diaphanus*], blacknose shiner [*Notropis heterolepis*], northern redbelly dace [*Chrosomus eos*], pallid sturgeon [*Scaphihynchus albus*], sicklefin chub [*Macrhybopsis meeki*], and sturgeon chub [*Macrhybopsis gelida*]) are only associated with the Missouri River and would not occur in the Project. State-threatened or endangered species that have potential to occur in the Project are described below. Interior least tern, whooping crane, and piping plover, are both state- and federally-listed species and are only described in the Federally-Listed Species section of this report.

Table 5. Species listed as endangered or threatened by the state of South Dakota that occur in Bon Homme and Charles Mix Counties.

Common Name	*Scientific Name*	Status
Mammals		
northern river otter	*Lontra canadensis*	State-Threatened
Birds		
bald eagle	*Haliaeetus leucocephalus*	State-Threatened
interior least tern	*Sterna antillarum athalassos*	Federally-Endangered, State-Endangered
piping plover	*Charadrius melodus*	Federally-Threatened, State-Threatened
whooping crane	*Grus americana*	Federally-Endangered, State-Endangered
Reptiles		
false map turtle	*Graptemys pseudogeographica*	State-Threatened

Table 5. Species listed as endangered or threatened by the state of South Dakota that occur in Bon Homme and Charles Mix Counties.

Common Name	*Scientific Name*	Status
Fish		
banded killifish	*Fundulus diaphanus*	State-Endangered
blacknose shiner	*Notropis heterolepis*	State-Endangered
northern redbelly dace	*Chrosomus eos*	State-Threatened
pallid sturgeon	*Scaphihynchus albus*	Federally-Endangered, State-Endangered
sicklefin chub	*Macrhybopsis meeki*	State-Endangered
sturgeon chub	*Macrhybopsis gelida*	State-Threatened

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is listed as a state-threatened species in South Dakota (SDGFP 2015b). Bald eagles are typically found near rivers, marshes, lakes, reservoirs, and coasts (Buehler 2000). They usually nest in forested places close to water bodies, avoiding heavily developed areas when possible (Buehler 2000). According to the SDGFP, and confirmed during the site visit, a bald eagle nest is located approximately 1.8 miles (2.9 km) north of the Project. Additionally, bald eagles could move through/over the Project year-round.

Grassland-Dependent Bird Species of Concern

Displacement of grassland nesting birds is often one of the primary concerns of wildlife agencies in regards to the siting of wind facilities in and near grasslands. Recent research has focused on the potential displacement of grassland passerines at wind energy facilities, and some uncertainty currently exists over the effects of wind energy facilities on the breeding success of these birds. In Minnesota, researchers found that breeding passerine density on Conservation Reserve Program (CRP) grasslands was reduced in the immediate vicinity of wind turbines (Leddy et al. 1999), but changes in density at broader scales was not detected (Johnson et al. 2000a). Erickson et al. (2004) documented a decrease in density of some native grassland passerines, such as grasshopper sparrow (*Ammodramus savannarum*), near wind turbines in Washington; however, it was not determined if the decreased density of grassland birds after the project was operating was the result of behavioral disturbance or habitat loss. Piorkowski (2006) conducted a displacement study at a wind energy facility in Oklahoma where, of the grassland species present in the wind resource area, only the western meadowlark (*Sturnella neglecta*) showed significantly lower densities near wind turbines. Piorkowski (2006) suggested that habitat characteristics were more important to determining passerine breeding densities than the presence of wind turbines. Shaffer and Buhl (2015) documented avoidance by grasshopper sparrows out to 300 m (984 ft) over time at wind projects in North and South Dakota.

Sharp-tailed grouse (*Tympanuchus phasianellus*), greater prairie chicken (*T. cupido*), Nelson's sparrow (*Ammodramus nelsoni*), Le Conte's sparrow (*A. leconteii*), chestnut-collared longspur (*Calcarius ornatus*), and bobolink (*Dolichonyx oryzivorus*) are dependent on grassland habitat, particularly large blocks of grassland (Johnson and Igl 2001), and may occur in the Project (Jennings et al. 2005). These species could be susceptible to adverse effects of grassland habitat fragmentation if this type of disturbance occurs as a result of facility construction. The Project has previously been subjected to fragmentation, primarily due to the conversion of grassland to areas of cultivated cropland (Table 1, Figure 4). Grassland areas that may support grassland birds are located throughout the Project, especially in the western portion of the Project where the landscape is more bisected by ravines. Facility development in the areas with less native grasslands, wetlands, and shrublands would likely have lower direct (e.g., habitat loss) and indirect impacts (e.g., displacement) to wildlife and plants, particularly to grassland-nesting bird species and native grassland plants. Limiting the footprint of any proposed developments, as well as utilizing previously developed roads and/or transmission corridors, could help to minimize any additional fragmentation.

Prairie Grouse

Sharp-tailed grouse and greater prairie chicken are prairie-obligate species that require relatively undisturbed or natural tallgrass prairie. These species tolerate some agricultural land interspersed with prairie, but both species generally become less numerous as the amount of agricultural land increases. Sharp-tailed grouse and greater prairie chicken are lekking species; leks are typically located on knolls or gentle rises. Male grouse and chickens may begin defending their territories on lekking grounds in late February, with peak hen attendance in early April.

Depending on findings during point counts and ultimately turbine placement, agencies may recommend that surveys for grouse species be conducted pre- and post-construction, with lek surveys for prairie grouse species conducted in the spring.

Birds of Conservation Concern

Although not protected under the ESA (1973), numerous bird species have been identified by the USFWS as Birds of Conservation Concern (BCC; USFWS 2008). These are “species, subspecies, and populations of migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973” (USFWS 2008). The Project lies within Bird Conservation Region (BCR) 11 (Prairie Potholes), a landscape dotted with many small depressional wetlands called potholes.

Twenty-seven bird species are listed as BCC within BCR 11 (USFWS 2008, Appendix B), many of which would have potential for occurrence within the Project (Jennings et al. 2005). Four diurnal raptors are among the BCC within BCR 11 with potential to occur in the Project (bald eagle [also a state-threatened species], Swainson’s hawk [*Buteo swainsoni*], and peregrine falcon. In addition to bald eagles, golden eagles (*Aquila chrysaetos*) have the potential to occur in the Project during some time of the year. The bald and golden eagles are protected by the Migratory Bird Treaty Act (MBTA 1918) and the Bald and Golden Eagle Protection Act (BGEPA 1940). Swainson’s hawks may breed in the Project, and peregrine falcons potentially migrate through the Project (Jennings et al. 2005). The remaining BCC species are a mix of shorebirds, waterbirds, owls, woodpeckers, and passerines, all of which likely have some potential for impacts from wind energy development (Appendix B).

Raptors

Species Likely to Occur in the Area

The following diurnal raptor and vulture species could potentially breed in or near the Project: American kestrel (*Falco sparverius*), bald eagle, golden eagle, Cooper's hawk (*Accipiter cooperii*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), ferruginous hawk (*B. regalis*), Swainson's hawk, broad-winged hawk (*B. platypterus*), peregrine falcon, osprey, and turkey vulture (*Cathartes aura;* Jennings et al. 2005). Owls with the potential to breed in or near the Project include barn owl (*Tyto alba*), burrowing owl (*Athene cunicularia*), eastern screech owl (*Otus asio*), long-eared owl (*Asio otus*), short-eared owl (*Asio flammeus*) and great horned owl (*Bubo virginianus;* Jennings et al. 2005).

Diurnal raptor species that may also occur within the Project outside of the breeding season (migration, winter, or post-breeding dispersal), include northern goshawk (*Accipiter gentilis*), Cooper's hawk, golden eagle, bald eagle, merlin (*Falco columbarius*), peregrine falcon, prairie falcon (*F. mexicanus*), gyrfalcon (*F. rusticolus*), red-tailed hawk, rough-legged hawk (*Buteo lagopus*), and sharp-shinned hawk (*Accipiter striatus*; Jennings et al. 2005). Owls that may occur outside of the breeding season include the eastern screech owl, great horned owl, northern saw-whet owl (*Aegolius acadicus*), long-eared owl, and short-eared owl (Jennings et al. 2005). During the site visit, four red-tailed hawk observations and two unidentified diurnal raptor observations were recorded at the Project (Table 3).

Potential for Raptor Migration in the Area

Several factors influence the migratory pathways of raptors, the most significant of which is geography. Two geographical features often used by raptors during migration are ridgelines and the shorelines of large bodies of water (Liguori 2005). Updrafts formed as the wind hits the ridges, and thermals, created over land and not water, make for energy-efficient travel over long distances (Liguori 2005). It is for this reason that raptors sometimes follow corridors or pathways, for example, along prominent ridges with defined edges, during migration.

It is likely that raptors migrate through the proposed Project in a broad front pattern with some potential for more localized use of ridge on the southwestern portion of the Project (Figure 3). Trees, shrubs, and water impoundments may provide some stopover habitat for migrating raptors; which are scattered throughout the Project and region (Figure 4).

Potential Raptor Nesting Habitat

During the site visit, small scattered woodlots, wooded farmsteads, shelter belts, and wooded draws and hillsides were observed that could provide raptor nesting habitat for species such as red-tailed hawk and Swainson's hawk. Grassland areas could provide nesting habitats for ground-nesting raptors and owls, such as the northern harrier and burrowing owl.

One known bald eagle nest is located approximately 1.8 mile north of the Project area. Additional surveys should focus on determining how or if eagles from this nest utilize the Project.

Potential Prey

Areas with colonial rodents or other prey species, such as rabbits and other birds, tend to attract foraging raptors. Small mammal colonies could potentially exist within the Project, but were not visible from public roads. No colonial rodents were observed during the site visit in February 2015. It is difficult to assess potential prey densities during a short-term site visit, and prey densities can fluctuate dramatically based on habitat and climatic factors. If roost sites and food resources are available, it is likely that raptors will use the area. However, it is not likely that raptors will use the area to a greater degree than the surrounding areas with similar habitat and resources.

Does the Topography of the Site Increase the Potential for Raptor Use?

At wind energy facilities located on prominent ridges with defined edges (e.g., rims of canyons, steep slopes), raptors often fly along the rim edges, using updrafts to maintain altitude while hunting, migrating or soaring (Johnson et al. 2000b, Hoover and Morrison 2005). Topography in the Project is relatively flat in the east but with slightly steep slopes in the western half of the Project Area (Figure 3). In addition, the Missouri River is approximately 6 miles south of the Project, which could increase overall raptor migration potential in the region.

Bird Migration

Although many species of passerines migrate at night and may collide with tall human-made structures, few large mortality events at wind energy facilities in North America have been documented on the same scale as those seen at communication towers (National Wind Coordinating Collaborative [NWCC] 2004). Large numbers of passerines have collided with lighted communication towers and buildings when foggy conditions occur at night during spring or fall migration. Birds appear to become confused by the lights during foggy or low cloud ceiling conditions, flying circles around lighted structures until they become exhausted or collide with the structure (Erickson et al. 2001). Most collisions at communication towers are attributed to the guy wires on these structures, which wind turbines do not have. Additionally, the large mortality events observed at communication towers have occurred at structures greater than 500 ft (152 m) in height (Erickson et al. 2001), likely because most small birds migrate at elevations of 500 to 1,000 ft (152.4 to 304.8 m) above the ground (USFWS 1998), which is higher than most modern turbines. Migrating passerines are likely more at risk of turbine collision when ascending and descending from stopover habitat, locations where migrating birds stop to rest or refuel, or during foggy conditions when they fly lower and may become confused by lights.

It is likely that birds such as passerines, raptors, and waterfowl may migrate through the proposed Project. Wetlands, woodlots, and grasslands, which are found throughout the Project, may provide stopover habitat for migrants or individuals during post-breeding dispersal. The combination of wetlands, ponds, lakes, and grasslands found in the Project may be attractive to a broader suite of bird species than when only one of these land cover types occurs. Harvested crop fields could also serve as feeding areas for migrating and wintering cranes and waterfowl.

These land cover types are found throughout the region, so use by these species should not be more concentrated in the Project than compared to adjacent areas.

Breeding Birds

<u>Important Bird Areas</u>

The National Audubon Society (Audubon) lists Important Bird Areas (IBAs) that are sites providing essential habitat for one or more species of birds (Audubon 2015). There are no Audubon IBAs or The Nature Conservancy (TNC) protected lands (USGS 2012) within the Project; however, there are two IBAs located south of the Project. The Missouri National Recreational River IBA is approximately 10 miles (16.1 km) south of the Project, while the Lower Missouri River Channel IBA is about 10.5 miles (16.9 km) south of the Project (Audubon 2013).

<u>USGS Breeding Bird Survey</u>

Two U.S. Geological Survey Breeding Bird Survey (BBS) routes are located in the vicinity of the Project (Figure 7; USGS 2013). The west end of the Tripp BBS route is approximately 13 miles (20.9 km) northeast of the northeast corner of the Project. The north end of the Sparta BBS route is south of the Missouri River, approximately 21.5 miles (34.6 km) southeast of the southeast corner of the Project. Each BBS route is about 25 miles (40.2 km) long, and all birds seen or heard are tallied for a 3-minute period every half-mile (0.8 km) along the route (USGS 1998).

A total of 70 bird species were recorded along the Tripp BBS route from 2011 to 2014 (Pardieck et al. 2014) and three of these species are listed as USFWS BCC (USFWS 2008; Appendix B). All three of these species were observed each year, from 2011-2014: red-headed woodpecker (*Melanerpes erythrocephalus*), grasshopper sparrow, and dickcissel (*Spiza americana*; Pardieck et al. 2014). In 2014, 915 individual bird observations of 56 species were made on the Tripp Route (Pardieck et al. 2014). The most abundant birds observed were the western meadowlark, brown-headed cowbird (*Molothrus ater*), mourning dove (*Zenaida macroura*), barn swallow (*Hirundo rustica*), and dickcissel. No federally- or state-listed threatened or endangered species have been recorded at the Tripp BBS route.

A total of 65 bird species have been recorded along the Sparta BBS route in 2011 and 2013 (Pardieck et al. 2014) and four of these species are listed as USFWS BCC (USFWS 2008; Appendix B). All four of these species were observed in 2011 and 2013: red-headed woodpecker, grasshopper sparrow, dickcissel, and upland sandpiper (*Bartramia longicauda*; Pardieck et al. 2014). In 2013, 1,392 individual bird observations of 56 species were made on the Sparta Route (Pardieck et al. 2014). The most abundant birds observed were the dickcissel, red-winged blackbird (*Agelaius phoeniceus*), common grackle (*Quiscalus quiscula*), mourning dove, and western meadowlark. No federally- or state-listed threatened or endangered species have been recorded at the Sparta BBS route.

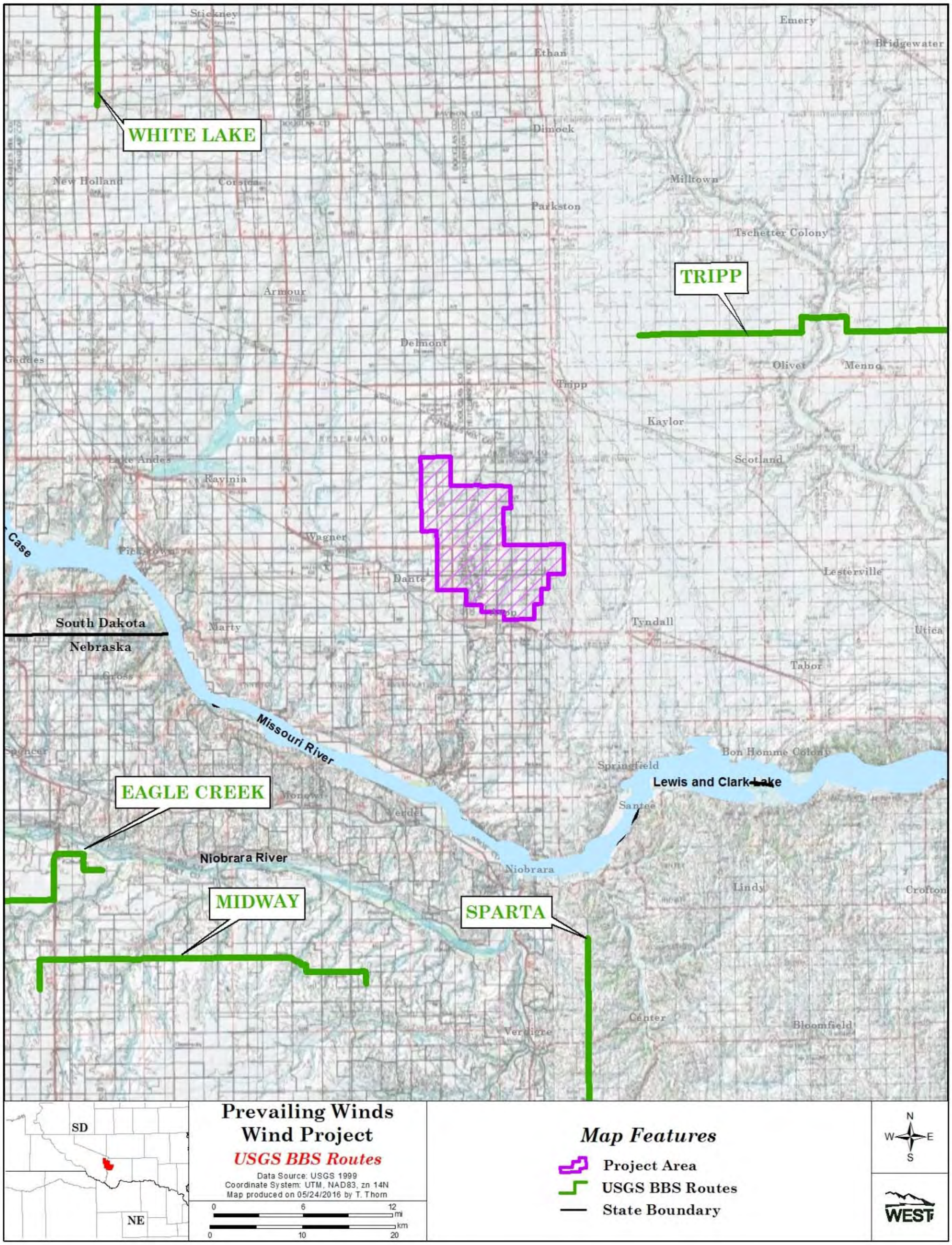

Figure 7. USGS Breeding Bird Survey routes.

Bats

At least 19 bat species have been documented as fatalities at wind energy facilities throughout the U.S. (Table 6). Up to 13 species of bats occur in South Dakota, and seven of these species are likely residents and/or migrants in the Project (Table 7, based on range maps [International Union for Conservation of Nature (IUCN) 2014]), including big brown bat (*Eptesicus fuscus*), eastern red bat (*Lasiurus borealis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), northern long-eared bat (*Myotis septentrionalis*), little brown bat (*M. lucifugus*), and western small-footed bat (*M. ciliolabrum*).

Table 6. Summary of bat fatalities (by species) from wind energy facilities in North America.

Common Name	Scientific Name	# Fatalities[1]	% Composition
hoary bat[2]	*Lasiurus cinereus*	5,027	36.5
eastern red bat[2]	*Lasiurus borealis*	3,179	23.1
silver-haired bat[2]	*Lasionycteris noctivagans*	2,500	18.2
little brown bat[2]	*Myotis lucifugus*	1,121	8.1
tricolored bat	*Perimyotis subflavus*	625	4.5
big brown bat[2]	*Eptesicus fuscus*	517	3.8
Mexican free-tailed bat	*Tadarida brasiliensis*	377	2.7
unidentified bat		325	2.4
unidentified myotis	*Myotis* spp.	32	0.2
northern long-eared bat[2]	*Myotis septentrionalis*	15	0.1
Seminole bat	*Lasiurus seminolus*	12	0.1
western red bat	*Lasiurus blossevillii*	9	0.1
big free-tailed bat	*Nyctinomops macrotis*	5	<0.1
evening bat	*Nycticeius humeralis*	5	<0.1
western yellow bat	*Lasiurus xanthinus*	3	<0.1
eastern small-footed bat	*Myotis leibii*	2	<0.1
Indiana bat	*Myotis sodalis*	2	<0.1
pocketed free-tailed bat	*Nyctinomops femorosacca*	2	<0.1
canyon bat	*Pipistrellus hesperus*	1	<0.1
cave bat	*Myotis velifer*	1	<0.1
long-legged bat	*Myotis volans*	1	<0.1
unidentified free-tailed bat		1	<0.1
unidentified Lasiurus bat	*Lasiurus* spp.	1	<0.1
Total	**19 species***	**13,763**	**100**

[1] These are raw data and are not corrected for searcher efficiency or scavenging.
[2] Potential resident or migrant in the BWP (BCI 2003).
Cumulative fatalities and species from data compiled by Western EcoSystems Technology, Inc. from publicly available fatality documents (listed in Appendix C). Indiana bat fatalities are reported by USFWS (2010, 2011c). Three additional Indiana bat fatalities (USFWS 2011b, 2012a, 2012c) are not included in this total.
* One incidental long-eared bat (*Myotis evotis*) was recorded at Tehachapi, California (Anderson et al. 2004), but is not included in the total fatalities. An additional 677 bat fatalities (evening bat, eastern red bat, hoary bat, tricolored bat, Mexican free-tailed bat, and unidentified bat) have been found in Texas (Hale and Karsten 2010), but the number of fatalities by species was not reported.
Canyon bat formerly known as western pipistrelle (*Pipistrellus hesperus*), and tricolored bat formerly known as eastern pipistrelle (*Pipistrellus subflavus*; BCI 2015b, 2015c).

Table 7. Bat species, based on International Union for Conservation of Nature (IUCN) 2014 range maps, with the potential to occur in the Prevailing Winds Wind Project.

Species	Scientific Name	State Status/ Federal Status	Habitat	Likelihood of Occurrence
northern long-eared bat	*Myotis septentrionalis*	PE[a]/FT	Associated with forests; chooses maternity roosts in buildings, under loose bark, and in the cavities of trees; caves and underground mines are their choice sites for hibernating. On western edge of range.	Unlikely
big brown bat	*Eptesicus fuscus*		Common in most habitats, abundant in deciduous forests and suburban areas with agriculture; maternity colonies beneath bark, tree cavities, buildings, barns, and bridges.	Likely
silver-haired bat	*Lasionycteris noctivagans*	S4[b]	Common bat in forested areas, particularly old growth; maternity colonies in tree cavities or hollows; hibernates in forests or cliff faces.	Likely
eastern red bat	*Lasiurus borealis*		Abundant tree bat; roosts in trees; solitary.	Likely
hoary bat	*Lasiurus cinereus*		Usually not found in man-made structures; roosts in trees; very wide-spread.	Likely
western small-footed bat	*Myotis ciliolabrum*		Found in mesic conifer forest, also riparian woodland; roosts in rock outcrops, clay banks, loose bark, buildings, bridges, caves, and mines.	Probable
little brown bat	*Myotis lucifugus*		Commonly forages over water; roosts in attics, barns, bridges, snags, and loose bark; hibernacula in caves and mines.	Probable

[a]Status from SDGFP 2015
PE = Proposed Endangered
[b]Status from SDGFP 2014
S4 = Apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Cause for long term concern.
FT = Federally Endangered

Potential roosting habitat (i.e. trees and buildings) exists within the Project as there are many abandoned structures scattered throughout the area. No caves or mines have been reported in the literature, and none were observed by a WEST biologist during the site visit. However, karst formations (characterized by sinkholes, caves, and underground drainage systems; Encyclopædia Britannica 2015) have been found within the Project according to the USGS National Atlas of the US (Tobin and Weary 2004).

Bats generally forage over water and open spaces, such as agricultural fields, grasslands, streams, and wetlands/ponds. Bats may prey on insects that are likely to concentrate over water in wetlands and streams, thus these types of areas found in the Project are most likely to attract foraging bats. Bats may forage over the entire Project, although the extent of use is not known.

Bat casualties have been reported from most wind energy faculties where post-construction fatality data are publicly available. Reported estimates of bat mortality at wind energy facilities have ranged from 0.01 – 47.5 fatalities per turbine per year (0.9 – 43.2 bats per MW per year) in the US, with an average of 3.4 per turbine or 4.6 per MW (NWCC 2004). The majority of the bat casualties at wind energy facilities to date are migratory species that undertake long migrations between summer roosts and wintering areas. The species most commonly found as fatalities at wind energy facilities include hoary bats, silver-haired bats, and eastern red bats (Johnson 2005). The highest numbers of bat fatalities found at wind energy facilities to date have occurred in eastern North America on ridge tops dominated by deciduous forest (NWCC 2004). However, Gruver et al. (2009), BHE Environmental (2010, 2011), Barclay et al. (2007), and Jain (2005) reported relatively high fatality rates from facilities in Wisconsin, Iowa, and Canada that were located in grassland and agricultural habitats. Unlike the eastern US wind energy facilities that reported higher bat fatality rates, the Wisconsin, Alberta, and Iowa facilities are in open grasslands and crop fields.

Construction of the proposed Project will likely result in the mortality of some bats. The magnitude of these fatalities and the degree to which bat species will be affected is difficult to determine, but they should be within the average range of bat mortalities found throughout the US based on general vegetation and landscape characteristics.

CONCLUSIONS

A summary of the potential for wildlife and habitat conflicts in the proposed wind energy facility development area is presented in Table 8.

Table 8. A summary of the potential (VH=Very High, H=High, M=Medium, and L=Low) for wildlife and habitat conflicts at the Prevailing Winds Wind Project.

Issue	VH	H	M	L	Notes
Potential for raptor nest sites			✓		Few tree rows and woodlots exist on the Project; few very small forests
Concentrated raptor flight potential			✓		The slightly steep slopes in the western half of the Project Area increases the potential for raptor use along the north/south ridges in the western half of the Project Area.
Potential for migratory pathway		✓			The Project is close to the Missouri River, thereby increasing potential for migratory pathway. The Project is close to the whooping crane migration corridor.
Potential for raptor prey species			✓		Suitable habitat for small mammals exists.
Potential for protected species to occur		✓			Protected species may occur in the area (e.g., bald eagle); There is concern about grassland fragmentation for prairie grouse and grassland birds.
Potential for State Issues		✓			Protection of native grasslands; likely state species issues exist as well
Uniqueness of habitat at wind energy facility			✓		Grasslands and shrublands found in the region. Displacement of grassland animals and plants may occur.
Potential for rare plants to occur			✓		Grasslands make up a moderate proportion of the Project; there is some likelihood that rare plants are present in grasslands that occur in the Project Area but impacts would depend on turbine siting.
Potential for use by bats			✓		The Project has scattered trees, buildings, and wetlands.

Seven animal species listed as federally-endangered, threatened, or proposed species have the potential to occur in Bon Homme and/or Charles Mix counties. These include the federally-endangered pallid sturgeon, Topeka shiner, interior least tern, and whooping crane; federally-threatened piping plover, red knot; and northern long-eared bat. Five of the seven species (interior least tern, whooping crane, piping plover, red knot, and northern long-eared bat) could potentially occur in the Project.

WEST conducted a preliminary review of the birds listed as threatened or endangered by the state of South Dakota and found four bird species with the potential to occur in or near the Project: interior least tern, whooping crane, piping plover, and bald eagle. Additionally, the northern long-eared bat is listed as a Species of Concern by SDGFP.

In general, native land cover, including wetlands, in most of the Project is not unique in the region, but their presence raises concerns regarding loss of native prairie. As the land cover is not unique to the region, these characteristics are not likely to attract or concentrate bird or bat species compared to surrounding areas. Habitat suitability may decrease for grassland birds in terms of increased habitat fragmentation and behavior modification (avoidance) if areas of intact grassland are impacted by construction. Greater prairie chickens and sharp-tailed grouse are of particular conservation interest to SDGFP, may be found in the Project, and may be susceptible to grassland fragmentation. Large areas of intact grassland should be avoided to minimize impacts to grassland dependent species.

Several raptor and vulture species could potentially breed in or near the Project as well as occur outside of the breeding season (migration, winter, or post-breeding dispersal Small scattered woodlots, wooded farmsteads, shelter belts, and wooded draws and hillsides are present in the Project that could provide raptor nesting habitat for species such as the red-tailed hawk, bald eagle, and Swainson's hawk. Grassland areas could provide nesting habitats for ground-nesting raptors, such as the northern harrier and burrowing owl.

Deciduous trees and buildings in the Project may provide potential roosting habitat and hibernacula for bats. Research to date on the impacts of wind energy facilities on bats has shown that species that conduct long distance migrations usually make up the vast majority of bat fatalities at wind energy facilities. Additionally, the timing of bat fatalities at wind energy facilities indicates that most bats are killed by turbines during the migration season (Johnson 2005, Arnett et al. 2008). Relatively few bat fatalities have been recorded at most wind energy facilities during spring or summer, although bat use at wind energy facilities has been recorded during those seasons. Risk of collision of resident bat species that may breed near wind energy facilities is not known. The Project is on the western edge of the range for the federally-threatened northern long-eared bat. Because it is possible that northern long-eared bat occupies the Project given the amount of trees, ponds, and lakes in the Project, acoustic surveys to investigate presence/absence are recommended. Further the northern long-eared bat is currently covered by a 4(d) rule determination as it pertains to wind energy development. An additional six bat species are likely to occur in the Project, including big brown bat, eastern red bat, hoary bat, silver-haired bat, little brown bat, and western small-footed bat (IUCN 2014).

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Young, D.P., Jr., K. Bay, S. Nomani, and W. Tidhar. 2010a. Nedpower Mount Storm Wind Energy Facility, Post-Construction Avian and Bat Monitoring: April - July 2010. Prepared for NedPower Mount Storm, LLC, Houston, Texas. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming. August 27, 2010.

Young, D.P., Jr., K. Bay, S. Nomani, and W. Tidhar. 2010b. Nedpower Mount Storm Wind Energy Facility, Post-Construction Avian and Bat Monitoring: July - October 2009. Prepared for NedPower Mount Storm, LLC, Houston, Texas. Prepared by Western EcoSystems Technology (WEST), Inc., Cheyenne, Wyoming. February 12, 2010.

Young, D.P., Jr., W. P. Erickson, K. Bay, S. Nomani, and W. Tidhar. 2009b. Mount Storm Wind Energy Facility, Phase 1 Post-Construction Avian and Bat Monitoring, July - October 2008. Prepared for NedPower Mount Storm, LLC, Houston, Texas. Prepared by Western EcoSystems Technology (WEST), Inc., Cheyenne, Wyoming. February 17, 2009.

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Young, D.P., Jr., J. D. Jeffrey, K. Bay, and W. P. Erickson. 2009c. Puget Sound Energy Hopkins Ridge Wind Project, Phase 1, Columbia County, Washington. Post-Construction Avian and Bat Monitoring, Second Annual Report: January - December, 2008. Prepared for Puget Sound Energy, Dayton, Washington, and the Hopkins Ridge Wind Project Technical Advisory Committee, Columbia County, Washington. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming, and Walla Walla, Washington. May 20, 2009.

Young, D.P., Jr., M. Lout, Z. Courage, S. Nomani, and K. Bay. 2012a. 2011 Post-Construction Monitoring Study, Criterion Wind Project, Garrett County, Maryland: April - November 2011. Prepared for Criterion Power Partners, LLC, Oakland, Maryland. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming, and Waterbury, Vermont. April 20, 2012. Revised November 25, 2013.

Young, D.P., Jr., C. Nations, M. Lout, and K. Bay. 2013. 2012 Post-Construction Monitoring Study, Criterion Wind Project, Garrett County, Maryland. April - November 2012. Prepared for Criterion Power Partners, LLC, Oakland, Maryland. Prepared by Western EcoSystems Technology, Inc. (WEST), Cheyenne, Wyoming, and Waterbury, Vermont. January 15, 2013.

Young, D.P., Jr., S. Nomani, Z. Courage, and K. Bay. 2011a. Nedpower Mount Storm Wind Energy Facility, Post-Construction Avian and Bat Monitoring: April - July 2011. Prepared for NedPower Mount Storm, LLC, Houston, Texas. Prepared by Western EcoSystems Technology (WEST), Inc., Cheyenne, Wyoming. August 29, 2011.

Young, D.P., Jr., S. Nomani, Z. Courage, and K. Bay. 2012b. Nedpower Mount Storm Wind Energy Facility, Post-Construction Avian and Bat Monitoring: July - October 2011. Prepared for NedPower Mount Storm, LLC, Houston, Texas. Prepared by Western EcoSystems Technology (WEST), Inc., Cheyenne, Wyoming. February 27, 2012.

Young, D.P., Jr., S. Nomani, W. Tidhar, and K. Bay. 2011b. Nedpower Mount Storm Wind Energy Facility, Post-Construction Avian and Bat Monitoring: July - October 2010. Prepared for NedPower Mount Storm, LLC, Houston, Texas. Prepared by Western EcoSystems Technology (WEST), Inc., Cheyenne, Wyoming. February 10, 2011.

Appendix A. Photographs of the Prevailing Winds Wind Project

Photo 1. Typical cropland habitat with a small woodlot in the distance in the Prevailing Winds Wind Project.

Photo 2. Typical hay field and wooded draw within the Prevailing Winds Wind Project.

Photo 3. Typical wooded hillside in southwestern portion of the Prevailing Winds Wind Project.

Photo 4. Typical grassland with scattered deciduous trees in the Prevailing Winds Wind Project.


Photo 5. Typical grassland in the Prevailing Winds Wind Project.


Photo 6. Mixed species grassland in the Prevailing Winds Wind Project.

Appendix B. Bird Species of Conservation Concern within the Prairie Potholes Region

Appendix B. US Fish and Wildlife Service (USFWS) Birds Conservation Concern (BCC) within the Bird Conservation Region (BCR) 11 (Prairie Potholes) and their presence/absence in the vicinity of the Prevailing Winds Wind Project (Pardieck et al. 2014, USFWS 2008).

Species	Recorded from 2011 to 2014 on Tripp Breeding Bird Survey Route?	Recorded in 2011 and 2013 on Sparta Breeding Bird Survey Route?
horned grebe	No	No
American bittern	No	No
least bittern	No	No
bald eagle	No	No
Swainson's hawk	No	No
peregrine falcon	No	No
yellow rail	No	No
mountain plover	No	No
solitary sandpiper	No	No
upland sandpiper	No	Yes
long-billed curlew	No	No
Hudsonian godwit	No	No
marbled godwit	No	No
buff-breasted sandpiper	No	No
short-billed dowitcher	No	No
black tern	No	No
black-billed cuckoo	No	No
short-eared owl	No	No
red-headed woodpecker	Yes	Yes
Sprague's pipit	No	No
grasshopper sparrow	Yes	Yes
Baird's sparrow	No	No
Nelson's sharp-tailed sparrow	No	No
McCown's longspur	No	No
Smith's longspur	No	No
chestnut-collared longspur	No	No
dickcissel	Yes	Yes

Appendix C. Summary of Publicly Available Reports from North American Wind Energy Facilities that have Reported Bat Fatalities

Appendix C. Summary of publicly available reports from North American wind energy facilities that have reported bat fatalities (Table 6).

Data from the following sources:

Project, Location	Reference	Project, Location	Reference
Alite, CA (09-10)	Chatfield et al. 2010	Klondike IIIa (Phase II), OR (08-10)	Gritski et al. 2011
Alta Wind I, CA (11-12)	Chatfield et al. 2012	Leaning Juniper, OR (06-08)	Gritski et al. 2008
Alta Wind II-V, CA (11-12)	Chatfield et al. 2012	Lempster, NH (09)	Tidhar et al. 2010
Barton I & II, IA (10-11)	Derby et al. 2011a	Lempster, NH (10)	Tidhar et al. 2011
Barton Chapel, TX (09-10)	WEST 2011	Linden Ranch, WA (10-11)	Enz and Bay 2011
Beech Ridge, WV (12)	Tidhar et al. 2013b	Locust Ridge, PA (Phase II; 09)	Arnett et al. 2011
Big Horn, WA (06-07)	Kronner et al. 2008	Locust Ridge, PA (Phase II; 10)	Arnett et al. 2011
Big Smile, OK (12-13)	Derby et al. 2013b	Madison, NY (01-02)	Kerlinger 2002b
Biglow Canyon, OR (Phase I; 08)	Jeffrey et al. 2009a	Maple Ridge, NY (06)	Jain et al. 2007
Biglow Canyon, OR (Phase I; 09)	Enk et al. 2010	Maple Ridge, NY (07)	Jain et al. 2009a
Biglow Canyon, OR (Phase II; 09-10)	Enk et al. 2011a	Maple Ridge, NY (07-08)	Jain et al. 2009d
Biglow Canyon, OR (Phase II; 10-11)	Enk et al. 2012b	Maple Ridge, NY (12)	Tidhar et al. 2013a
Biglow Canyon, OR (Phase III; 10-11)	Enk et al. 2012a	Marengo I, WA (09-10)	URS Corporation 2010b
Blue Sky Green Field, WI (08; 09)	Gruver et al. 2009	Marengo II, WA (09-10)	URS Corporation 2010c
Buena Vista, CA (08-09)	Insignia Environmental 2009	Mars Hill, ME (07)	Stantec 2008
Buffalo Gap I, TX (06)	Tierney 2007	Mars Hill, ME (08)	Stantec 2009a
Buffalo Gap II, TX (07-08)	Tierney 2009	McBride, Alb (04)	Brown and Hamilton 2004
Buffalo Mountain, TN (00-03)	Nicholson et al. 2005	Melancthon, Ont (Phase I; 07)	Stantec Ltd. 2008
Buffalo Mountain, TN (05)	Fiedler et al. 2007	Meyersdale, PA (04)	Arnett et al. 2005
Buffalo Ridge, MN (94-95)	Osborn et al. 1996, 2000	Moraine II, MN (09)	Derby et al. 2010d
Buffalo Ridge, MN (00)	Krenz and McMillan 2000	Mount Storm, WV (Fall 08)	Young et al. 2009b
Buffalo Ridge, MN (Phase I; 96)	Johnson et al. 2000a	Mount Storm, WV (09)	Young et al. 2009a, 2010b
Buffalo Ridge, MN (Phase I; 97)	Johnson et al. 2000a	Mount Storm, WV (10)	Young et al. 2010a, 2011b
Buffalo Ridge, MN (Phase I; 98)	Johnson et al. 2000a	Mount Storm, WV (11)	Young et al. 2011a, 2012b
Buffalo Ridge, MN (Phase I; 99)	Johnson et al. 2000a	Mountaineer, WV (03)	Kerns and Kerlinger 2004
Buffalo Ridge, MN (Phase II; 98)	Johnson et al. 2000a	Mountaineer, WV (04)	Arnett et al. 2005
Buffalo Ridge, MN (Phase II; 99)	Johnson et al. 2000a	Munnsville, NY (08)	Stantec 2009b
Buffalo Ridge, MN (Phase II; 01/Lake Benton I)	Johnson et al. 2004	Nine Canyon, WA (02-03)	Erickson et al. 2003
Buffalo Ridge, MN (Phase II; 02/Lake Benton I)	Johnson et al. 2004	Noble Altona, NY (10)	Jain et al. 2011b
Buffalo Ridge, MN (Phase III; 99)	Johnson et al. 2000a	Noble Bliss, NY (08)	Jain et al.2009e
Buffalo Ridge, MN (Phase III; 01/Lake Benton II)	Johnson et al. 2004	Noble Bliss, NY (09)	Jain et al. 2010a
Buffalo Ridge, MN (Phase III; 02/Lake Benton II)	Johnson et al. 2004	Noble Bliss/Wethersfield, NY (11)	Kerlinger et al. 2011
Buffalo Ridge I, SD (09-10)	Derby et al. 2010b	Noble Chateaugay, NY (10)	Jain et al. 2011c
Buffalo Ridge II, SD (11-12)	Derby et al. 2012a	Noble Clinton, NY (08)	Jain et al. 2009c
Casselman, PA (08)	Arnett et al. 2009	Noble Clinton, NY (09)	Jain et al. 2010b
Casselman, PA (09)	Arnett et al. 2010	Noble Ellenburg, NY (08)	Jain et al. 2009b
Castle River, Alb. (01)	Brown and Hamilton 2006a	Noble Ellenburg, NY (09)	Jain et al. 2010c
Castle River, Alb. (02)	Brown and Hamilton 2006a	Noble Wethersfield, NY (10)	Jain et al. 2011a
Cedar Ridge, WI (09)	BHE Environmental 2010	NPPD Ainsworth, NE (06)	Derby et al. 2007
Cedar Ridge, WI (10)	BHE Environmental 2011	Oklahoma Wind Energy Center, OK (04; 05)	Piorkowski and O'Connell 2010
Cohocton/Dutch Hill, NY (09)	Stantec 2010	Pebble Springs, OR (09-10)	Gritski and Kronner 2010b
Cohocton/Dutch Hills, NY (10)	Stantec 2011	PGC site 6-3 (07)	Capouillez and Librandi-Mumma 2008, Librandi-Mumma and Capouillez 2011
Combine Hills, OR (Phase I; 04-05)	Young et al. 2006	Pine Tree, CA (09-10)	BioResource Consultants 2010
Combine Hills, OR (11)	Enz et al. 2012	Pioneer Prairie I, IA (Phase II; 11-12)	Chodachek et al. 2012
Condon, OR	Fishman Ecological Services 2003	PrairieWinds ND1 (Minot), ND (10)	Derby et al. 2011c
Crescent Ridge, IL (05-06)	Kerlinger et al. 2007	PrairieWinds ND1 (Minot), ND (11)	Derby et al. 2012c
Criterion, MD (11)	Young et al. 2012a	PrairieWinds SD1 (Crow Lake), SD (11-12)	Derby et al. 2012d
Criterion, MD (12)	Young et al. 2013	PrairieWinds SD1 (Crow Lake), SD (12-13)	Derby et al. 2013a
Crystal Lake II, IA (09)	Derby et al. 2010a	Prince Wind Farm, Ont (06)	Natural Resource Solutions 2008
Diablo Winds, CA (05-07)	WEST 2006, 2008	Prince Wind Farm, Ont (07)	Natural Resource Solutions 2009
Dillon, CA (08-09)	Chatfield et al. 2009	Prince Wind Farm, Ont (08)	Natural Resource Solutions 2009
Dry Lake I, AZ (09-10)	Thompson et al. 2011	Red Canyon, TX (06-07)	Miller 2008
Dry Lake II, AZ (11-12)	Thompson and Bay 2012	Red Hills, OK (12-13)	Derby et al. 2013c
Elkhorn, OR (08)	Jeffrey et a. 2009b	Ripley, Ont (08)	Jacques Whitford 2009
Elkhorn, OR (10)	Enk et al. 2011b	Ripley, Ont (08-09)	Golder Associates 2010
Elm Creek, MN (09-10)	Derby et al. 2010c	Rugby, ND (10-11)	Derby et al. 2011b
Elm Creek II, MN (11-12)	Derby et al. 2012b	Searsburg, VT (97)	Kerlinger 2002a

Appendix C. Summary of publicly available reports from North American wind energy facilities that have reported bat fatalities (Table 6).

Data from the following sources:

Project, Location	Reference	Project, Location	Reference
Foote Creek Rim, WY (Phase I; 99)	Young et al. 2003	Shiloh I, CA (06-09)	Kerlinger et al. 2009
Foote Creek Rim, WY (Phase I; 00)	Young et al. 2003	Shiloh II, CA (09-10)	Kerlinger et al. 2010
Foote Creek Rim, WY (Phase I; 01-02)	Young et al. 2003	SMUD Solano, CA (04-05)	Erickson and Sharp 2005
Forward Energy Center, WI (08-10)	Grodsky and Drake 2011	Stateline, OR/WA (01-02)	Erickson et al. 2004
Fowler I, IN (09)	Johnson et al. 2010a	Stateline, OR/WA (03)	Erickson et al. 2004
Fowler III, IN (09)	Johnson et al. 2010b	Stateline, OR/WA (06)	Erickson et al. 2007
Fowler I, II, III, IN (10)	Good et al. 2011	Steel Winds I, NY (07)	Grehan 2008
Fowler I, II, III, IN (11)	Good et al. 2012	Stetson Mountain I, ME (09)	Stantec 2009c
Fowler I, II, III, IN (12)	Good et al. 2013	Stetson Mountain I, ME (11)	Normandeau Associates 2011
Goodnoe, WA (09-10)	URS Corporation 2010a	Stetson Mountain II, ME (10)	Normandeau Associates 2010
Grand Ridge I, IL (09-10)	Derby et al. 2010g	Summerview, Alb (05-06)	Brown and Hamilton 2006b
Harrow, Ont (10)	Natural Resource Solutions 2011	Summerview, Alb (06; 07)	Baerwald 2008
Harvest Wind, WA (10-12)	Downes and Gritski 2012a	Top of Iowa, IA (03)	Jain 2005
Hay Canyon, OR (09-10)	Gritski and Kronner 2010a	Top of Iowa, IA (04)	Jain 2005
High Sheldon, NY (10)	Tidhar et al. 2012a	Tuolumne (Windy Point I), WA (09-10)	Enz and Bay 2010
High Sheldon, NY (11)	Tidhar et al. 2012b	Vansycle, OR (99)	Erickson et al. 2000
High Winds, CA (03-04)	Kerlinger et al. 2006	Vantage, WA (10-11)	Ventus Environmental Solutions 2012
High Winds, CA (04-05)	Kerlinger et al. 2006	Wessington Springs, SD (09)	Derby et al. 2010f
Hopkins Ridge, WA (06)	Young et al. 2007	Wessington Springs, SD (10)	Derby et al. 2011d
Hopkins Ridge, WA (08)	Young et al. 2009c	White Creek, WA (07-11)	Downes and Gritski 2012b
Jersey Atlantic, NJ (08)	NJAS 2008a, 2008b, 2009	Wild Horse, WA (07)	Erickson et al. 2008
Judith Gap, MT (06-07)	TRC 2008	Windy Flats, WA (10-11)	Enz et al. 2011
Judith Gap, MT (09)	Poulton and Erickson 2010	Winnebago, IA (09-10)	Derby et al. 2010e
Kewaunee County, WI (99-01)	Howe et al. 2002	Wolfe Island, Ont (May-June 09)	Stantec Ltd. 2010a
Kibby, ME (11)	Stantec 2012	Wolfe Island, Ont (July-December 09)	Stantec Ltd. 2010b
Kittitas Valley, WA (11-12)	Stantec Consulting 2012	Wolfe Island, Ont (January-June 10)	Stantec Ltd. 2011a
Klondike, OR (02-03)	Johnson et al. 2003	Wolfe Island, Ont (July-December 10)	Stantec Ltd. 2011b
Klondike II, OR (05-06)	NWC and WEST 2007	Wolfe Island, Ont (January-June 11)	Stantec Ltd. 2011c
Klondike III (Phase I), OR (07-09)	Gritski et al. 2010	Wolfe Island, Ont (July-December 11)	Stantec Ltd. 2012

Two Indiana bat fatalities are reported by USFWS (2010, 2011c), among other reports. Three additional Indiana bat fatalities have been reported (2011b, 2012a, 2012c), but are not included in this list of public reports. One incidental long-eared bat (*Myotis evotis*) was recorded at Tehachapi, California (Anderson et al. 2004), but is not included in this list of public reports. Additional bat fatalities (evening bat, eastern red bat, hoary bat, tri-colored bat, Mexican free-tailed bat, and unidentified bat) have been found in Texas (Hale and Karsten 2010), but the number of fatalities by species was not reported.

APPENDIX E - RAPTOR NEST SURVEY REPORT

ENVIRONMENTAL & STATISTICAL CONSULTANTS
4007 State Street, Suite 109, Bismarck, ND 58503
Phone: 701-250-1756 ◆ www.west-inc.com ◆ Fax: 701-250-1761

June 29, 2016

Roland Jurgens III
Prevailing Winds, LLC
101 Second Street West
P.O. Box 321
Chokio, Minnesota 56221

RE: Prevailing Winds Raptor Nest Survey

Dear Mr. Jurgens,

As part of agency approved baseline survey efforts, one aerial raptor nest survey was conducted by a biologist from Western EcoSystems Technology, Inc. (WEST) on April 21, 2016, at the Prevailing Winds Wind Energy Project (Project) near Avon, South Dakota. Surveys were completed from the air in a helicopter before trees had leaves and when most raptors would be actively tending to a nest or incubating eggs. Aerial surveys were conducted in accordance with the guidance provided in the U.S. Fish and Wildlife Service Inventory and Monitoring Protocols[1]. Raptors are defined here as kites, accipiters, buteos, harriers, eagles, falcons, and owls. Surveys focused on locating large, stick nest structures in suitable raptor nesting substrate (trees, cliffs, etc.) within the proposed Project and 10-mi buffer. All raptor nests were recorded within the Project boundary with only eagle or potential eagle nests located out to the 10-mi buffer.

Known historic eagle nests locations were surveyed for nest status and condition as well as a survey for new or unknown nest locations. In general, all potential eagle and raptor nest habitat was surveyed by flying meandering transects at speeds of 60 - 75 miles per hour (mph) throughout the proposed Project area and associated 10-mi buffer. To the greatest extent possible, care was taken to minimize disturbance to raptors at nest sites during surveys.

All potential and confirmed raptor nests detected during surveys, regardless of their activity status, were assigned a unique identification number and their locations were recorded using a hand-held Global Positioning System (GPS). Data on raptor species, nest type, nest status, nest condition, and substrate, were recorded at each nest location to the extent possible. To determine the status of a nest, the biologist relied on clues that included behavior of adults and presence of eggs, young, or whitewash. Unoccupied raptor nests, including old nests or nests that could become suitable for raptors, were

[1] Pagel, J.E., D.M. Whittington, and G.T. Allen. 2010. Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance. US Fish and Wildlife Service (USFWS). February 2010. Available online at: http://steinadlerschutz.lbv.de/fileadmin/www.steinadlerschutz.de/terimGoldenEagleTechnicalGuidanceProtocols25March2010_1_.pdf

documented in order to populate a nest database to ensure that future surveys include all potentially suitable nest sites. Photographs were taken of eagle nests and potential eagle nests and are available to you upon request.

Nest status was categorized consistent with definitions in the USFWS Eagle Conservation Plan Guidance.[2] Nests were classified as occupied if any of the following were observed at the nest structure: (1) an adult in an incubating position; (2) eggs; (3) nestlings or fledglings; (4) occurrence of a pair of adults (or, sometimes sub-adults); (5) a newly constructed or refurbished stick nest in the area where territorial behavior of a raptor was observed or had been observed early in the breeding season; or (6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. When possible, occupied nests were further classified as active if an egg or eggs had been laid or nestlings were observed, or inactive if no eggs or chicks were present. A nest that did not meet the above criteria for "occupied" was classified as "unoccupied.

A total of 50 occupied and/or unoccupied raptor nests representing three species were documented within the Project area and associated 10-mi buffer (Figures 1 and 2, Tables 1 and 2). Excluding eagles, 44 non-eagle raptor nests were documented within the Project area (Figure 1; Table 1). The identified raptor nests were categorized as follows: three occupied great horned owl (*Bubo virginianus*) nests; 10 occupied red-tailed hawk (*Buteo jamaicensis*) nests; and 31 unknown raptor nests (two occupied; 29 unoccupied). A total of six bald eagle (*Haliaeethus leucocephalus*) nests (three occupied; three unoccupied) were documented during the survey; with three occupied bald eagle nests corresponded to known historic nests (Figure 2; Table 2).

If you have any questions or require additional information, please call me at 701-250-1756.

Sincerely,

Clayton Derby
CSO/Senior Manager

[2] US Fish and Wildlife Service (USFWS). 2013. Eagle Conservation Plan Guidance. Module 1 - Land-Based Wind Energy. Version 2. Division of Migratory Bird Management, USFWS. April 2013. Available online at: http://www.fws.gov/migratorybirds/Eagle_Conservation_Plan_Guidance-Module%201.pdf

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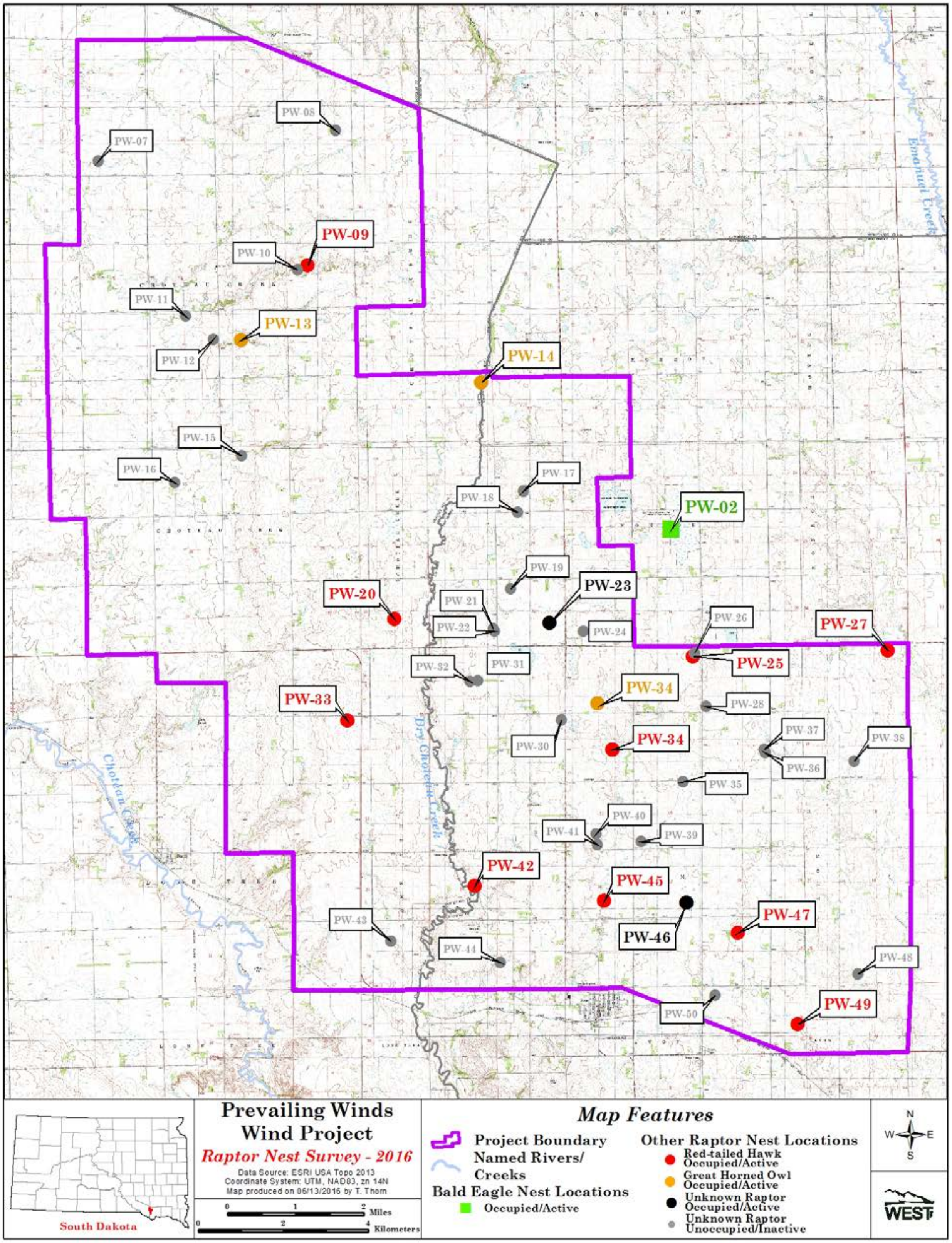

Figure 1. Locations of raptor nests (excluding eagles) recorded during the aerial survey conducted on April 21, 2016, within the Prevailing Winds Wind Energy Project, South Dakota.

Available upon request.

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Table 1. Raptor nests (excluding eagle nests) identified during aerial surveys conducted on April 21, 2016, within the Prevailing Winds Wind Energy Project area, South Dakota. Raptor nest Unique ID (ID), locations (NAD83, Zone 14), and nest features are included.

ID	Species	Easting	Northing	Nest Type	Status at Time of Survey	Condition	Substrate
PW-07	UNKN	564811	4781827	stick/medium	unoccupied	good	tree
PW-08	UNKN	570395	4782547	stick/medium	unoccupied	fair	tree
PW-09	RTHA	569739	4779367	stick/medium	occupied	excellent	tree
PW-10	UNKN	569502	4779268	stick/medium	unoccupied	good	tree
PW-11	UNKN	566861	4778176	stick/medium	unoccupied	fair	tree
PW-12	UNKN	567520	4777624	stick/medium	unoccupied	good	tree
PW-13	GHOW	568181	4777616	stick/medium	occupied	excellent	tree
PW-14	GHOW	573826	4776621	stick/medium	occupied	excellent	tree
PW-15	UNKN	568182	4774885	stick/medium	unoccupied	fair	tree
PW-16	UNKN	566612	4774253	stick/medium	unoccupied	excellent	tree
PW-17	UNKN	574813	4774054	stick/medium	unoccupied	good	tree
PW-18	UNKN	574674	4773552	stick/medium	unoccupied	fair	tree
PW-19	UNKN	574516	4771760	stick/medium	unoccupied	good	tree
PW-20	RTHA	571792	4771048	stick/medium	occupied	excellent	tree
PW-21	UNKN	574105	4770818	stick/small	unoccupied	good	tree
PW-22	UNKN	574140	4770757	stick/small	unoccupied	good	tree
PW-23	UNKN	575444	4770951	stick/medium	occupied	excellent	tree
PW-24	UNKN	576219	4770748	stick/medium	unoccupied	fair	tree
PW-25	RTHA	578806	4770170	stick/medium	occupied	excellent	tree
PW-26	UNKN	578846	4770235	stick/medium	unoccupied	good	tree
PW-27	RTHA	583400	4770300	stick/medium	occupied	excellent	tree
PW-28	UNKN	579119	4768991	stick/medium	unoccupied	poor	tree
PW-29	GHOW	576574	4769059	stick/medium	occupied	excellent	tree
PW-30	UNKN	575714	4768671	stick/medium	unoccupied	dilapidated	tree
PW-31	UNKN	573746	4769595	stick/medium	unoccupied	poor	tree
PW-32	UNKN	573555	4769572	stick/medium	unoccupied	excellent	tree
PW-33	RTHA	570679	4768649	stick/medium	occupied	excellent	tree
PW-34	RTHA	576918	4767976	stick/medium	occupied	excellent	tree
PW-35	UNKN	578572	4767214	stick/medium	unoccupied	good	tree
PW-36	UNKN	580501	4767890	stick/medium	unoccupied	fair	tree
PW-37	UNKN	580485	4767967	stick/medium	unoccupied	fair	tree
PW-38	UNKN	582594	4767702	stick/medium	unoccupied	fair	tree
PW-39	UNKN	577594	4765802	stick/medium	unoccupied	poor	tree
PW-40	UNKN	576525	4765992	stick/medium	unoccupied	good	tree
PW-41	UNKN	576556	4765731	stick/medium	unoccupied	fair	tree
PW-42	RTHA	573679	4764757	stick/medium	occupied	excellent	tree
PW-43	UNKN	571701	4763454	stick/medium	unoccupied	fair	tree
PW-44	UNKN	574264	4762960	stick/medium	unoccupied	excellent	tree
PW-45	RTHA	576728	4764411	stick/medium	occupied	excellent	tree
PW-46	UNKN	578657	4764367	stick/medium	occupied	excellent	tree
PW-47	RTHA	579872	4763654	stick/medium	occupied	excellent	tree
PW-48	UNKN	582691	4762686	stick/medium	unoccupied	good	tree
PW-49	RTHA	581273	4761506	stick/medium	occupied	excellent	tree
PW-50	UNKN	579326	4762188	stick/medium	unoccupied	good	tree

GHOW = great-horned owl; RTHA = red-tailed hawk; UNKN = unknown.

Available upon request.

APPENDIX F - AVIAN USE SURVEYS, YEAR ONE

Avian Use Surveys for the Prevailing Winds Wind Project Bon Homme and Charles Mix Counties, South Dakota

Year One Final Draft Report

March 2015 – February 2016

Prepared for:

Prevailing Winds, LLC

Prepared by:

Clayton Derby, Sofia Agudelo, and Terri Thorn

Western EcoSystems Technology, Inc.
4007 State Street
Bismarck, North Dakota 58503

February 16, 2018

EXECUTIVE SUMMARY

Prevailing Winds, LLC. (Prevailing Winds), has proposed a wind energy facility in Bon Homme and Charles Mix counties, South Dakota, referred to as the Prevailing Winds Wind Project (Project). Prevailing Winds contracted Western EcoSystems Technology, Inc. (WEST) to conduct field surveys developed in coordination with the United States (US) Fish and Wildlife Service (USFWS) and South Dakota Game Fish and Parks (SDGFP). Surveys were designed to assess wildlife resources in the Project area and assess risk to special-status species by addressing the issues posed under Tier 3 of the USFWS Final Land-Based Wind Energy Guidelines. The following document contains results for the general fixed-point bird use surveys and incidental wildlife observations. A summary of all data collected is contained in the document, but the overall body of the report focuses on a smaller group of species – diurnal raptors, eagles, state/federally listed species, and South Dakota Sensitive Species (State Species of Concern [SSC] and State Species of Greatest Conservation Need [SGCN]).

The principal objectives of the fixed-point bird use surveys were to: 1) assess the relative abundance and spatial distribution of species in the Project area during all seasons, and 2) identify and assess the potential risk of adverse impacts to species or groups.

Fixed-point bird use surveys were conducted at 16 survey points from March 25, 2015 – February 21, 2016. Each survey plot was surveyed for 60 minutes (min). Every bird and/or unique bird species group observed during the first 20 min of each fixed-point bird use survey was recorded using two viewsheds: 800-meter (m; 2,625-feet [ft]) radius plot for large birds and 100-m (328-ft) radius plot for small birds, observations beyond the radius plots were excluded from analysis. Large birds included waterbirds, waterfowl, rails and coots, grebes and loons, gulls and terns, shorebirds, diurnal raptors, owls, vultures, upland game birds, doves/pigeons, large corvids (e.g., ravens, magpies, and crows), and goatsuckers. Passerines (excluding large corvids), kingfishers, swifts/hummingbirds, woodpeckers, and most cuckoos were considered small birds. During the next 40 min of the survey period, only eagles and state/federally listed species were recorded out to the 800-m radius.

A total of 271 fixed-point bird use surveys were conducted during 18 visits. During all surveys and incidental observations, no federally or state-listed species were detected. Seven bird species (great blue heron, bald eagle, Cooper's hawk, ferruginous hawk, northern goshawk, sharp-shinned hawk, and Swainson's hawk) listed as South Dakota SGCN and/or SSC were observed during fixed-point surveys and incidentally.

Diurnal raptor use at the Project was low (was 0.31 raptors/800-m plot/20-min survey), compared to other US wind facilities and comparable to other wind energy facilities in the Midwest with publicly available data. Fatality monitoring data collected at wind projects in the Midwest suggest that some collision risk exists for individual raptors, but the level of impact is not likely to cause significant adverse impacts to overall species populations.

Significant adverse impacts to overall bird populations are not anticipated at the Project based on data collected at the site, review of available literature, and results of post-construction fatality monitoring at other wind energy facilities. Further post-construction survey effort should be determined in consultation with appropriate agencies to confirm the anticipated impacts.

STUDY PARTICIPANTS

Western EcoSystems Technology

Clayton Derby	Project Manager
Carmen Boyd	Data Manager
Wendy Bruso	Technical Editing Manager
Katie Wynne	Technical Editing Coordinator
Mandy Kauffman	Data Analyst
Terri Thorn	GIS Specialist
Sofia Agudelo	Report Writer/Technical Editor
Karen Seginak	Field Technician
Brenda Jarski-Weber	Field Technician
Cathy Clayton	Field Technician

REPORT REFERENCE

Derby, C., S. Agudelo, and T. Thorn. 2018. Avian Use Surveys for the Prevailing Winds Wind Project, Bon Homme and Charles Mix Counties, South Dakota. Year One Final Report: March 2015 – February 2016. Prepared for Prevailing Winds, LLC. Prepared by Western EcoSystems Technology, Inc. (WEST), Bismarck, North Dakota. 34 pages + appendices

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INTRODUCTION

In 2015, Prevailing Winds LLC. (Prevailing Winds) contracted Western EcoSystems Technology, Inc. (WEST) to conduct field surveys in accordance with agency recommendations to quantify wildlife resources within the Prevailing Winds Wind Project (Project) in Bon Homme and Charles Mix counties, South Dakota. Year-round surveys were conducted by WEST in 2015 – 2016 to address the issues posed under Tier 3, following guidance in the United States (US) Fish and Wildlife Service (FWS) *Final Land-Based Wind Energy Guidelines* (Guidelines; USFWS 2012) and *Eagle Conservation Plan Guidance* (Guidance; USFWS 2013), within the Project area as delineated in 2015 (Figure 1).

Fixed-point bird use surveys were conducted to achieve these principal objectives: 1) assess the relative abundance and spatial distribution of species in the Project area during an entire year, with emphasis on eagles, non-eagle raptors, and state/federally listed species, and 2) identify and assess the potential risk of adverse impacts to special-status species or groups.

The following document contains results for the general fixed-point bird use surveys and incidental wildlife observations for the study period 2015 – 2016 (Year One), with focus on eagles, non-eagle diurnal raptors, state/federally listed species, and South Dakota special-status species (i.e., State Species of Greatest Conservation Need [SGCN] and State Species of Concern [SSC]). A second year of survey (Year Two) was conducted in 2016-2017 and is reported separately as the Project area changed.

STUDY AREA

The Project area used for surveys conducted in 2015 – 2016 encompassed approximately 18,139.5 hectares (ha; 44,823.7 acres [ac]) in Bon Homme and Charles Mix counties, adjacent to the town of Avon in southeastern South Dakota (Figure 1). The Project, located in a higher elevated area within the greater landscape, is characterized by a generally flat topography, with elevation ranging from 432.0 meters (m; 1,417.3 feet [ft]) – 573.7 m (1,882.2 ft; US Geological Survey [USGS] Digital Elevation Model 2017). The Project area, historically dominated by grasslands, has extensively been converted to agricultural use, with crop production and livestock grazing the primary practices (Bryce et al. 1998). Approximately 40% of the proposed Project area is cropland followed by pasture/hay land (37%); grassland/herbaceous cover represents approximately 8% of the Project area while all other land cover/land use types compose less than 5% each of the Project area (USGS National Land Cover Database 2011). As evidenced during the site visit conducted by WEST in 2015, trees and woodlands are found mainly in planted shelter belts and within draws and on hillslopes; wetlands are scattered throughout the Project area (Figure 2), with the USFWS National Wetland Inventory (NWI) indicating approximately 676 ha (1,670 ac) of wetlands (USFWS NWI 2015).

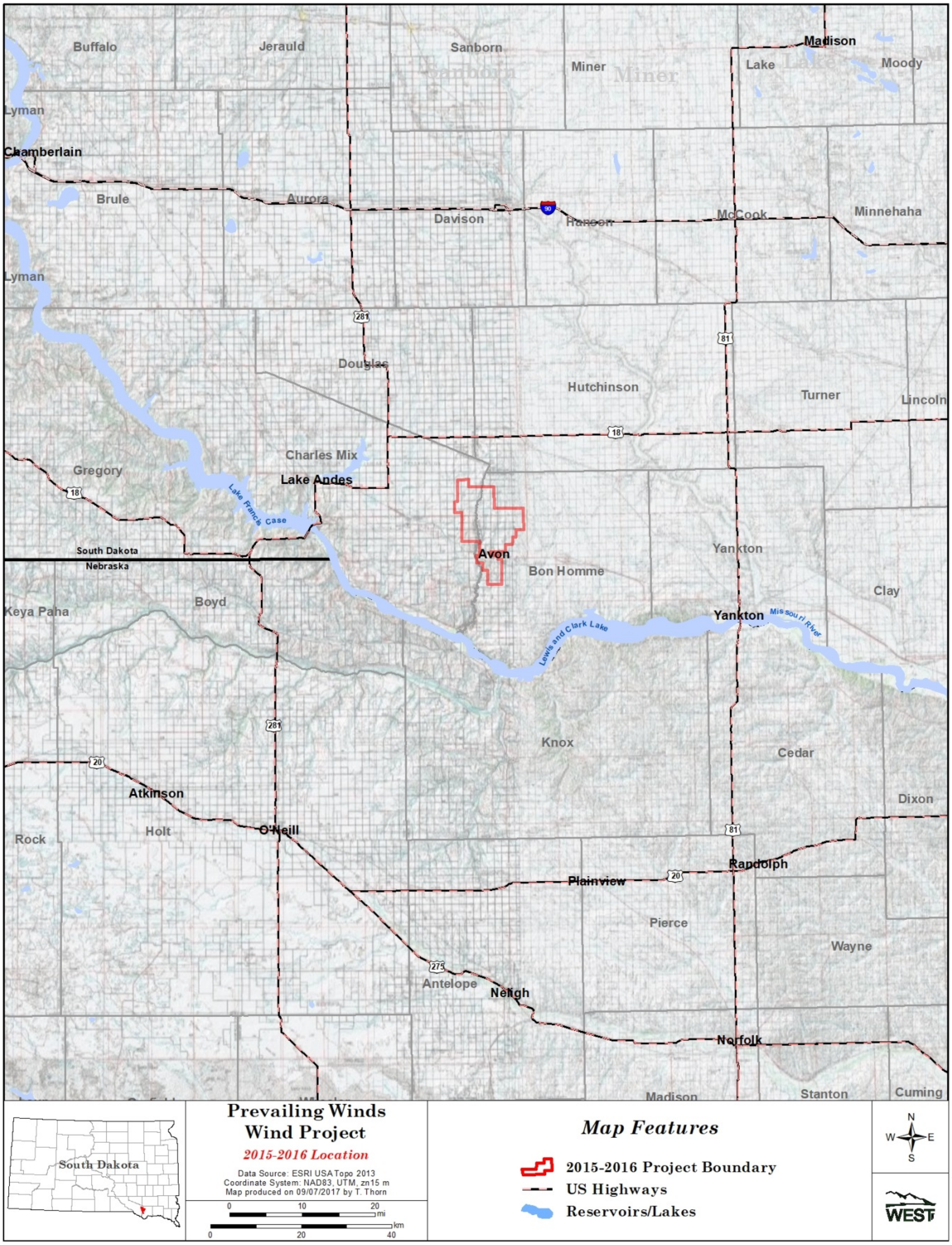

Figure 1. Location of the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, for surveys conducted in 2015 – 2016.

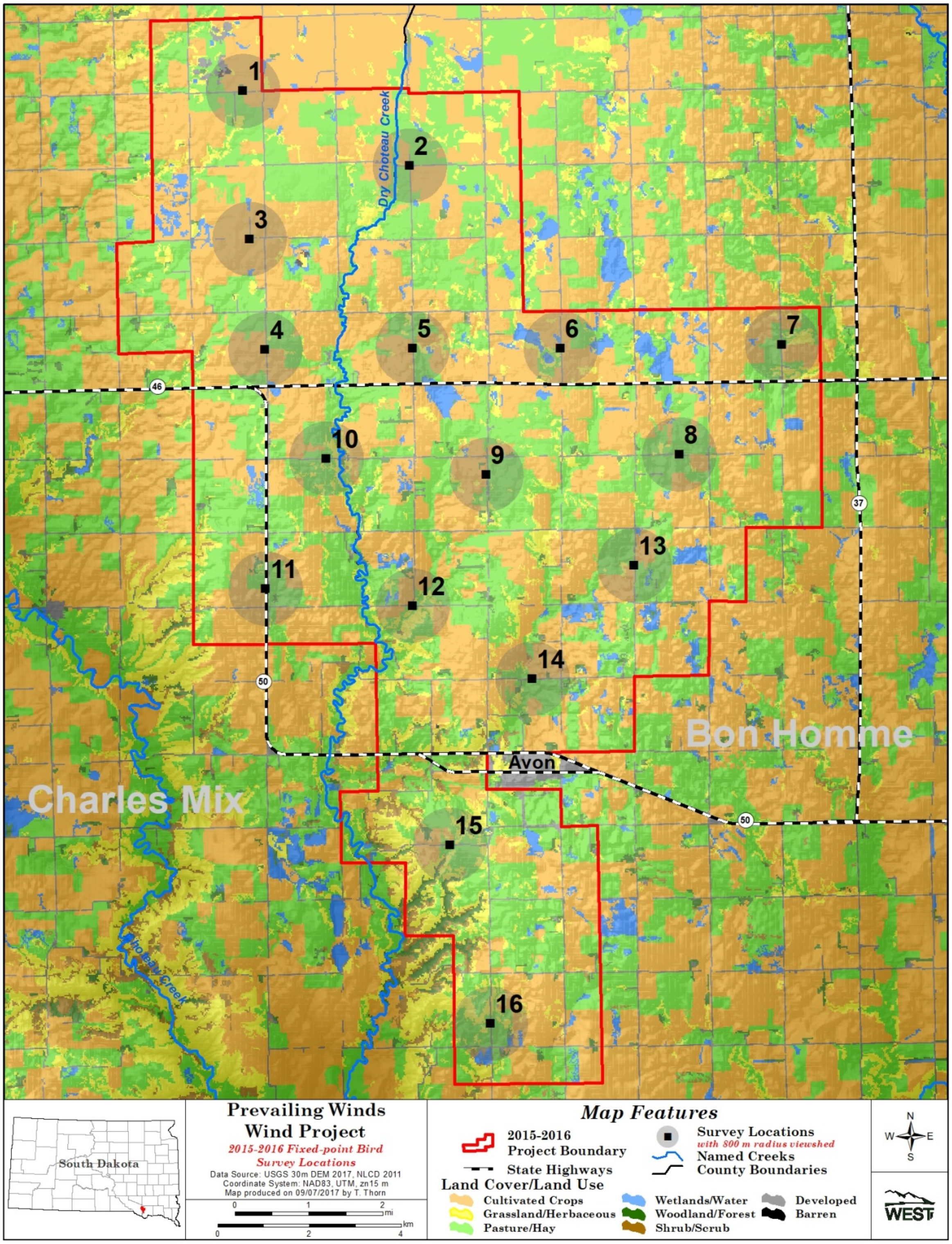

Figure 2. Land cover/Land use and location of the fixed-point plots selected for the Year One bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016 (USFWS NLCD 2011, Homer et al. 2015).

METHODS

Fixed-Point Bird Use Surveys

Fixed-point bird use surveys (variable circular plots) were conducted using methods described by Reynolds et al. (1980), to estimate the seasonal and spatial use of the study area by birds, particularly diurnal raptors (defined here as kites, accipiters, buteos, harriers, eagles, falcons, and osprey [*Pandion haliaetus*]). Methodologies employed during avian use surveys conducted at the Project are generally comparable to those used at past wind energy facilities in South Dakota.

Survey Plots

Sixteen points were selected to survey representative habitats and topography of the Project, while achieving relatively even coverage of the study area (Figure 2). Each survey plot was an 800-m (2,625-ft) radius circle centered on the point; for analysis purposes, only birds within the 800-m radius plot were considered for analysis to allow comparison to other projects that used similar analyses.

Survey Methods

Each survey plot was surveyed for 60 minutes (min). Every bird and/or unique bird species group observed during the first 20 min of each fixed-point bird use survey was recorded by a unique observation number. During the next 40 min of the survey period, only eagles and state/federally listed species and state species of concern were recorded out to the 800-m radius. In some cases, the tally of observations may represent repeated sightings of the same individual. Observations of large birds beyond the 800-m radius were recorded but were not included in statistical analyses. For small birds, observations beyond the 100-m (328-ft) radius were excluded. Large birds included waterbirds, waterfowl, rails and coots, grebes and loons, gulls and terns, shorebirds, diurnal raptors, owls, vultures, upland game birds, doves/pigeons, large corvids (e.g., ravens, magpies, and crows), and goatsuckers. Passerines (excluding large corvids), kingfishers, swifts/hummingbirds, woodpeckers, and most cuckoos were considered small birds.

The date, start and end time of the survey period, and weather information (e.g., temperature, wind speed and direction, and cloud cover) were recorded for each survey. Species or best possible identification, number of individuals, sex and age class (if possible), distance from plot center when first observed, closest distance, altitude above ground, activity (behavior), and habitat(s) were recorded for each observation. Bird behavior and habitat type were recorded based on the point of first observation. Approximate flight height and distance from plot center at first observation were recorded to the nearest 5-m (16-ft) interval. Other information collected included whether the observation was auditory only and the 10-min interval of the survey in which the detection first occurred. Locations and flight paths, if applicable, of large birds were recorded during fixed-point bird use surveys on field maps by unique observation number. Data on eagle flight paths and habitat use (i.e., distance from observer, activity, and flight height) were recorded on a per min basis; comments were made when appropriate. Incidental wildlife observations were recorded while conducting all surveys, moving between fixed-point locations, and traveling within the Project. All raptors, state and federal special-status bird species were documented.

Observation Schedule

Survey intensity (i.e., number of fixed-point circular plots and frequency of monitoring) was designed to document year-round use and behavior of birds in the Project area. Fixed-point bird use surveys were conducted approximately twice per month in the spring (March 4 – May 20) and fall (September 9 – November 28), and monthly during winter (November 29 – March 3) and summer (May 21 – September 8). Surveys were carried out during daylight hours and survey periods varied to approximately cover all daylight hours during a season. To the extent practicable, each point was surveyed roughly the same number of times.

Statistical Analysis

For analysis purposes, a visit was defined as the required length of time, in days, to survey all of the plots once within the Project area. Under certain circumstances, such as extreme weather conditions, all plots may not have been surveyed during a visit. In these cases, a visit might not have constituted a survey of all plots.

Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) measures were implemented at all stages of the study, including in the field, during data entry and analysis, and report writing. Following field surveys, observers were responsible for inspecting data forms for completeness, accuracy, and legibility. Potentially erroneous data were identified using a series of database queries. Irregular codes or data suspected as questionable were discussed with the observer and/or project manager. Errors, omissions, and/or problems identified in later stages of analysis were traced back to the raw data forms, and appropriate changes in all steps were made.

Data Compilation and Storage

A Microsoft® MSSQL database was developed to store, organize, and retrieve survey data. Data were keyed into the electronic database using a pre-defined protocol to facilitate subsequent QA/QC and data analysis. All data forms and electronic data files were retained for reference.

Fixed-Point Bird Use Surveys

<u>Bird Diversity and Species Richness</u>

Bird diversity was illustrated by the total number of unique species observed. Species lists and counts, with the number of observations and the number of groups, were generated by season and included all observations of birds detected, regardless of their distance from the observer. In some cases, the tally of observations may represent repeated sightings of the same individual. Species richness was calculated for each season by first averaging the total number of species observed within each plot during a visit, then averaging across plots within each visit, followed by averaging across visits within each season. Overall species richness was calculated as a weighted average of seasonal values by the number of days in each season.

Mean Use, Percent of Use, and Frequency of Occurrence

Large birds detected within the 800-m radius plot and small birds recorded within the 100-m radius plot were used to calculate mean use and frequency of occurrence. The metric used for mean bird use was number of birds per plot (100-m radius plot for small birds, 800-m radius plot for large birds) per 20-min survey. Seasonal mean use was calculated by first averaging the total number of birds seen within each plot during a visit, then averaging across plots within each visit, followed by averaging across visits within each season. Overall mean use was calculated as a weighted average of seasonal values by the number of days in each season. Percent of use was calculated as the proportion of large or small bird use that was attributable to a particular bird type or species, and frequency of occurrence was calculated as the percent of surveys in which a particular bird type or species was observed. Frequency of occurrence, calculated as the percent of surveys in which a particular bird type or species was observed, provides a relative measure of species exposure to the proposed Project.

Bird Flight Height and Behavior

Bird flight heights are important metrics to assess potential exposure. Flight height information was used to calculate the percentage of birds observed flying within the rotor-swept heights (RSH; estimated to be between 25 – 200 m [82 – 656 ft] above ground level). The flight height recorded during the initial observation was used to calculate the percentage of birds flying within the RSH and mean flight height. The percentage of birds flying within the RSH at any time was calculated using the lowest and highest flight heights recorded. Auditory only observations were excluded from flight height calculations.

Spatial Use

Spatial use of the Project area was evaluated using mean use by survey point. For each species and bird group, the number of individuals observed at each point during the 20-min survey was divided by the total number of surveys at that point.

RESULTS

Year 1 Surveys were completed within the Project area from March 25, 2015 – February 21, 2016. Summary statistics for the full suite of species observed in the Project area are presented in Appendix A. Results related to eagles, non-eagle raptors, federally/state-listed species (Endangered Species Act [ESA] 1973, South Dakota Game, Fish and Parks [SDGFP] 2016, USFWS 2017), and State non-listed special-status species (SGCN [SDGFP 2014] and SSC [SDGFP 2017]), are more thoroughly covered in the body of this report.

Fixed-Point Bird Use Surveys

Bird Diversity and Species Richness

A total of 271 fixed-point bird use surveys were conducted during 18 visits to the Project area during Year One of surveys: 63 surveys in spring, 77 in summer, 78 in fall, and 53 in winter (Table 1). Seventy-two unique bird species were observed during the entire duration (60 min) of the fixed-point bird use surveys (Table 1). Bird diversity (the number of unique species observed for entire 60-min survey) was highest during the summer (43 species), followed by fall (38), spring (36), and winter (23). Overall species richness (mean number of species/plot/20-min survey) was higher for small birds (1.64) compared to large birds (1.20), being lowest in the winter compared to all other seasons, for both large and small birds (0.96 and 0.54 species/plot/20-min survey, respectively).

Table 1. Number of visits, surveys, bird diversity (number of unique species for entire 60-minute [min] survey), and species richness (species/plot[a]/20-min survey) by season and overall, observed during the Year One fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

Season	Number of Visits	Number of Surveys Conducted	Bird Diversity	Bird Species Richness	
				Large Birds	Small Birds
Spring	4	63	36	1.11	1.25
Summer	5	77	43	1.42	2.22
Fall	5	78	38	1.33	2.46
Winter	4	53	23	0.96	0.54
Overall	**18**	**271**	**72**	**1.20**	**1.64**

[a.] 800-meter [m] radius plot for large birds and 100-m radius plot for small birds.

A total of 8,194 observations in 914 separate groups (defined as one or more individuals) were recorded during the first 20 min of the Year One of the fixed-point bird use surveys (Appendix A1). Regardless of bird size, six identified species (8.3% of all species) accounted for approximately half (52%) of all observations: Canada goose (*Branta canadensis*; 858 observations in 10 groups), European starling (*Sturnus vulgaris*; 787 observations in 13 groups), sandhill crane (*Antigone canadensis*; 735 observations in four groups), Franklin's gull (*Leucophaeus pipixcan*; 713 observations in five groups), snow goose (*Chen caerulescens*; 590 observations in four groups), and red-winged blackbird (*Agelaius phoeniceus*; 574 observations in 42 groups). All other species each accounted for less than 6% of the total observations.

Waterfowl accounted for the majority (2,145 observations within 44 groups) of large bird observations, with Canada goose being the most abundant waterfowl species; waterbirds composed 9% (736 observations) of the total bird observations, with only two waterbird species (sandhill cranes and great blue herons) being recorded during bird use surveys (Appendix A1). Passerines accounted for the majority (3,890 observations within 532 groups) of small bird observations, with European starling being the most abundant passerine species.

Eighty-nine diurnal raptor observations within 83 groups were recorded during the first 20 min of the Year One fixed-point bird use surveys conducted at the Project, representing eight unique species (Table 2; Appendix A1). Red-tailed hawk (*Buteo jamaicensis*; 55 observations in 51 groups) and northern harrier (*Circus cyaneus*; 11 observations within 11 groups) were the most commonly observed raptor species, accounting for 61.8% and 12.4% of all raptor observations, respectively. No federally (ESA 1973) or state-listed (SDGFP 2016) species were observed during Year One fixed-point bird use surveys conducted at the Project.

Table 2. Number of groups and individuals of diurnal raptors observed, regardless of distance from observer, during the first 20 minutes of the Year One fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

		Spring		Summer		Fall		Winter		Total	
Raptor Subtype/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
Accipiters		*0*	*0*	*0*	*0*	*2*	*2*	*3*	*3*	*5*	*5*
Cooper's hawk[a]	*Accipiter cooperii*	0	0	0	0	2	2	2	2	4	4
northern goshawk[a,b]	*Accipiter gentilis*	0	0	0	0	0	0	1	1	1	1
Buteos		*6*	*7*	*8*	*8*	*30*	*34*	*13*	*14*	*57*	*63*
red-tailed hawk	*Buteo jamaicensis*	6	7	8	8	28	30	9	10	51	55
rough-legged hawk	*Buteo lagopus*	0	0	0	0	0	0	3	3	3	3
Swainson's hawk[a]	*Buteo swainsoni*	0	0	0	0	2	4	0	0	2	4
unidentified buteo	*Buteo spp*	0	0	0	0	0	0	1	1	1	1
Northern Harrier		*2*	*2*	*4*	*4*	*5*	*5*	*0*	*0*	*11*	*11*
northern harrier	*Circus cyaneus*	2	2	4	4	5	5	0	0	11	11
Eagles		*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*1*
bald eagle[a,b]	*Haliaeetus leucocephalus*	0	0	0	0	0	0	1	1	1	1
Falcons		*0*	*0*	*0*	*0*	*0*	*0*	*2*	*2*	*2*	*2*
American kestrel	*Falco sparverius*	0	0	0	0	0	0	2	2	2	2
Other Raptors		*1*	*1*	*2*	*2*	*4*	*4*	*0*	*0*	*7*	*7*
unidentified hawk		1	1	1	1	2	2	0	0	4	4
unidentified raptor		0	0	1	1	2	2	0	0	3	3
Overall Diurnal Raptors		**9**	**10**	**14**	**14**	**41**	**45**	**19**	**20**	**83**	**89**

Grps = Number of groups, # Obs = Number of observations

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

[b.] State Species of Greatest Conservation Need (SDGFP 2014)

Mean Use, Percent of Use, and Frequency of Occurrence

Mean bird use, percent of use, and frequency of occurrence by season for all bird types and species observed during the first 20 min of surveys are shown in Appendix A2; Table 3 shows a summary of mean use and frequency of occurrence by major bird type and species of concern. The highest overall large bird use occurred during spring (30.43 birds/800-m plot/20-min survey), followed by winter (14.56), fall (8.43), and summer (2.40; Appendix A2). In general, seasonal use by large bird use was primarily driven by waterfowl use (Appendix A2). Small bird use was highest in the fall and winter (15.71 and 11.53 birds/100-m plot/20-min survey, respectively), compared to summer and spring (6.90 and 6.01, respectively); seasonal small bird use was largely driven by passerine use (Appendix A3).

Waterbird use was restricted to the migration periods (10.17 and 0.44 birds/800-m plot/20-min survey for spring and fall surveys, respectively; Table 3), with two species (sandhill crane and great blue heron [*Ardea herodias*]) comprising the totality of observations recorded during the study period (Appendix A2). Great blue heron, a SSC, was observed in spring only (0.02 birds/800-m plot/20-min survey); sandhill cranes were observed in both spring (10.16 birds/800-m plot/20-min survey) and fall (0.44). Waterbirds were observed more frequently during the spring (3.2%) compared to fall (1.2%; Table 3).

Diurnal raptor use was highest in the fall at 0.52 raptors/800-m plot/20-min survey, followed by winter (0.45), summer (0.18), and spring (0.10; Table 3). Higher raptor use during the fall was primarily due to relatively high use of the Project area by red-tailed hawks (0.36). Red-tailed hawks were observed year round and had the highest use of any other diurnal raptor species during all seasons (0.05, 0.10, and 0.21 during spring, summer, and winter, respectively); northern harrier use was observed in all seasons but winter, ranging from 0.03 – 0.06 birds/800-m plot/20-min survey; Table 3).

Use by Cooper's hawk (*Accipiter cooperii*; a SSC) was observed during fall (0.03 birds/800-m plot/20-min survey) and winter (0.06). Use by American kestrel (*Falco sparverius*), rough-legged hawk (*Buteo lagopus*), northern goshawk (*Accipiter gentilis*; SSC and SGCN), and bald eagle (*Haliaeetus leucocephalus*; SGCN), was observed exclusively during the winter during the first 20 min of fixed-point bird use surveys, ranging from 0.02 – 0.07 birds/800-m plot/20-min survey (Table 3). Bald eagle was the only eagle observed during surveys conducted at the Project (Appendix A1 and A2). Bald eagles were observed during 1.6% of winter surveys (Table 3). Diurnal raptors were observed during 37.4% of winter and 35.9% of fall surveys compared to 13.9% of summer and 7.9% of spring surveys (Table 3; Appendix A2).

Passerine use was higher during the fall and winter (15.59 and 11.48 birds/100-m plot/20-min survey, respectively), compared to the summer and spring (6.83 and 5.88, respectively; Table3). Brown-headed cowbird (*Molothrus ater*) had the highest passerine use during the spring (1.52 birds/100-m plot/20-min survey; Appendix A3); red-winged blackbird (*Agelaius phoeniceus*) had the highest use (1.54) of passerine species observed in summer; unidentified blackbirds had the highest use in the fall (5.50); and horned lark (*Eremophila alpestris*) had the highest use in the winter (7.15; Appendix A3).

Passerines were observed during 90.6% of the surveys during spring, 90.0% during summer, 65.0% during fall, and 39.6% during winter (Table 3).

Table 3. Seasonal bird mean use and frequency of occurrence for waterbirds, waterfowl, passerines, diurnal raptor species, and special-status species observed during the first 20 minutes of Year One fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

	Mean Use[1]				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Waterbirds	**10.17**	**0**	**0.44**	**0**	**3.2**	**0**	**1.2**	**0**
great blue heron[a]	0.02	0	0	0	1.7	0	0	0
Waterfowl	**8.21**	**0.18**	**4.01**	**11.66**	**22.1**	**5.5**	**5.2**	**7.8**
Diurnal Raptors	**0.10**	**0.18**	**0.52**	**0.45**	**7.9**	**13.9**	**35.9**	**37.4**
Accipiters	*0*	*0*	*0.03*	*0.1*	*0*	*0*	*2.7*	*10*
Cooper's hawk[a]	0	0	0.03	0.06	0	0	2.7	5.8
northern goshawk[a,b]	0	0	0	0.04	0	0	0	4.2
Buteos	*0.05*	*0.10*	*0.41*	*0.3*	*4.7*	*8.9*	*32*	*24.2*
red-tailed hawk	0.05	0.10	0.36	0.21	4.7	8.9	29.3	15.2
rough-legged hawk	0	0	0	0.07	0	0	0	7.4
Swainson's hawk[a]	0	0	0.06	0	0	0	2.7	0
unidentified buteo	0	0	0	0.02	0	0	0	1.6
Northern Harrier	*0.03*	*0.05*	*0.06*	*0*	*3.2*	*5*	*6.4*	*0*
northern harrier	0.03	0.05	0.06	0	3.2	5	6.4	0
Eagles	*0*	*0*	*0*	*0.02*	*0*	*0*	*0*	*1.6*
bald eagle[a,b]	0	0	0	0.02	0	0	0	1.6
Falcons	*0*	*0*	*0*	*0.03*	*0*	*0*	*0*	*3.3*
American kestrel	0	0	0	0.03	0	0	0	3.3
Other Raptors	*0.02*	*0.02*	*0.01*	*0*	*1.7*	*2.5*	*1.4*	*0*
unidentified hawk	0.02	0.01	0.01	0	1.7	1.2	1.4	0
unidentified raptor	0	0.01	0	0	0	1.2	0	0
Passerines	**5.88**	**6.83**	**15.59**	**11.48**	**90.6**	**90.0**	**65.0**	**39.6**

Note: Totals by bird type and overall might not correspond to the sum of individual species due to rounding

1. 800-meter (m; 2,625-foot [ft]) radius plot for large birds; 100-m (328-ft) radius plot for small birds

a. State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

b. State Species of Greatest Conservation Need (SDGFP 2014)

State and Federal Special-status Species Observations

No federally (ESA 1973) or state-listed (SDGFP 2016) species were observed during Year One of bird use surveys conducted in the Project area from March 25, 2015 – February 21, 2016 (Table 4). Seven non-listed special-status species were recorded during fixed-point bird use surveys and incidentally, including seven bald eagles within six groups (Table 4). The bald eagle, a State SGCN and SSC, is further protected under the Bald and Golden Eagle Protection Act (1940). Two additional South Dakota SGCN were observed, both of which were raptors (one incidental ferruginous hawk [*Buteo regalis*] observation, and one northern goshawk observation during fixed-point surveys). The other five non-listed special-status species were three SSC raptors (five Cooper's hawk observations [one incidental, four during fixed-point surveys], one incidental sharp-shinned hawk [*Accipiter striatus*] observation, and six Swainson's hawk [*Buteo swainsoni*] observations [two incidental, four during fixed-point surveys]), and one SSC waterbird (one great blue heron observation during fixed-point surveys); see Species Specific Summaries section for a detailed discussion of these species..

Table 4. Non-listed special-status species observed during fixed-point bird use surveys (FP)[a] and Incidentally (Inc.) within the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

			FP		Inc.		Total	
Species	**Scientific Name**	**Status**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
great blue heron	*Ardea herodias*	SSC	1	1	0	0	1	1
bald eagle	*Haliaeetus leucocephalus*	SGCN, SSC, BGEPA	4	4	2	3	6	7
Cooper's hawk	*Accipiter cooperii*	SSC	4	4	1	1	5	5
ferruginous hawk	*Buteo regalis*	SGCN	0	0	1	1	1	1
northern goshawk	*Accipiter gentilis*	SGCN; SSC	1	1	0	0	1	1
sharp-shinned hawk	*Accipiter striatus*	SSC	0	0	1	1	1	1
Swainson's hawk	*Buteo swainsoni*	SSC	2	4	2	2	4	6

Grps = Number of groups, # Obs = Number of observations

[a.] Within 60-minute (min) survey for large birds and 20-min survey for small birds

BGEPA = Bald and Eagle Protection Act (1940)

SGCN = State Species of Greatest Conservation Need (SDGFP 2014)

SSC = State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

Bird Flight Height and Behavior

Flight height characteristics, based on initial flight height observations (i.e., only observations with the first activity not equal to perched were included) and estimated use, were estimated for both bird types and species (Tables 5 and 6). During the 60-min fixed-point bird use surveys, 182 groups of large birds were observed flying within the 800-m radius plot, totaling 2,313 individuals. Overall, 53.8% of flying large birds were recorded within the RSH, 18.1% were below the RSH, and 28.1% were flying above the RSH for collision with turbine blades of 25 – 200 m (82 – 656 ft) above ground level. The majority (94.8%) of waterbirds observed were recorded flying above the estimated RSH, while most (96.4%) of the waterfowl observations were recorded flying within the estimated RSH (Table 5). More than half (58.2%) of flying diurnal raptors were observed below the RSH, while 41.8% were within the RSH and none were above the RSH (Table 5). Eagles and other raptors represented the highest percentage of flying diurnal raptors recorded within the RSH (66.7%), followed by buteos (51.4%).

During the first 20 min of the fixed-point bird use surveys, 218 groups of small birds were observed flying within the 100-m radius plot, totaling 1,660 individuals, mostly passerines (Table 5). Overall, 91.9% of flying small birds were recorded below the RSH (Table 5).

Table 5. Flight height (meters [m] above ground level), based on initial observation, characteristics by bird types and raptor subtypes observed during Year One of the fixed-point bird use surveys[a] conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

Bird Type/Subtype	# Groups Flying	# Obs Flying	Mean Flight Height (m)	% Obs Flying	% Within Flight Height Categories < 25 m	25 - 200 m[b]	> 200 m
Waterbirds	4	686	476.00	100	5.20	0	94.80
Waterfowl	30	1,075	45.27	67.0	3.60	96.40	0
Shorebirds	28	108	8.39	66.7	77.80	22.20	0
Gulls/Terns	4	184	43.75	25.0	33.70	66.30	0
Diurnal Raptors	50	55	29.90	66.3	58.20	41.80	0
Accipiters	3	3	10.67	60.0	100.00	0	0
Buteos	30	35	34.00	61.4	48.60	51.40	0
Northern Harrier	11	11	8.73	100	90.90	9.10	0
Eagles	3	3	43.33	75.0	33.30	66.70	0
Falcons	0	0	0.00	0	0	0	0
Unidentified Raptors	3	3	72.33	75.0	33.30	66.70	0
Vultures	8	17	68.12	89.5	5.90	94.10	0
Upland Game Birds	1	1	1.00	1.4	100.00	0	0
Doves/Pigeons	46	141	8.35	59.0	90.80	9.20	0
Large Corvids	9	44	15.78	64.7	81.80	18.20	0
Goatsuckers	2	2	25.00	66.7	0	100.00	0
Large Birds Overall	182	2,313	34.55	63.0	18.10	53.80	28.10
Passerines[c]	212	1,653	5.58	62.0	91.80	8.20	0
Woodpeckers	6	7	4.00	28.0	100.00	0	0
Small Birds Overall	218	1,660	5.54	61.7	91.90	8.10	0

Obs = Observations

[a.] 800-meter (m; 2,625-foot [ft]) radius plot and 60-minute (min) survey for large birds; 100-m (328-ft) radius plot and 20 min survey for small birds

[b.] The likely rotor-swept height for potential collision with a turbine blade, or 25 – 200 m (82 – 656 ft) above ground level

[c.] Excluding large corvids

Three of four total bald eagles observed were first observed in flight. Based on initial observation, the majority (66.7%) of bald eagle groups observed during the full 60-min survey were observed within the RSH. No other special-status species were observed flying within the RSH at any time (Table 6).

Table 6. Flight characteristics for special-status species observed[a] during Year One of the fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

Species	# Groups Flying	Overall Mean Use	% Flying	% Flying within RSH[b] Based on Initial Observation	% Within RSH at Anytime
bald eagle	3	0.01	75.0	66.7	66.7
Cooper's hawk	3	0.02	75.0	0	0
great blue heron	1	<0.01	100	0	0
northern goshawk	0	0.01	0	0	0
Swainson's hawk	1	0.01	75.0	0	0

[a.] 800-meter (m; 2,625-foot [ft]) radius plot and 60-minute (min) survey for large birds; 100-m (328-ft) radius plot and 20 min survey for small birds

[b.] The likely rotor-swept height (RSH) for potential collision with a turbine blade, or 25 – 200 m (82-656 ft) above ground level

Spatial Use

For all large bird species combined, use (focused within 800 m) was highest at Point 1 (73.35 birds/20-min survey) largely due to high waterbird use at this point (38.24 birds/20-min survey); waterbirds were observed at two other points, with use ranging from 0.06 – 1.94 (Table 7). Large bird use at other points ranged from 1.41 – 34.11 birds/20-min survey. Diurnal raptors were observed at all points with use largely driven by buteos and harriers (Table 7). Waterfowl use was recorded at all but two points, ranging from 0.06 – 29.88 birds/20-min survey, and shorebird use was recorded at all points, ranging from 0.06 – 2.28 birds/20-min survey. Diurnal raptor use was highest at Point 10 (0.50 birds/20-min survey), and ranged from 0.12 – 0.47 birds/20-min survey at other points. Eagle use (for the observations included in the overall avian analysis that includes just the first 20-min of survey at each point) occurred at Point 2 only (0.06 birds/20-min survey), while falcons were only observed at Points 11 and 16 (0.06 birds/20-min survey at each point). Small bird use (focused within 100 m), was highest at Point 6 (28.28 birds/20-min survey), and ranged from 4 – 14.71 birds/20-min surveys at all other points; small bird use at all points was largely due to use by passerines (Table 7).

Table 7. Mean use recorded at each survey point during the first 20 minutes of Year One fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

	Mean Use (number of birds/20-minute survey)[a] by Survey Point															
Bird Type	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Waterbirds	**38.24**	**0**	**0**	**0**	**0**	**1.94**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0.06**	**0**	**0**
Waterfowl	**0.12**	**11.78**	**0.12**	**0.28**	**0.12**	**28.61**	**2.00**	**29.88**	**0**	**0.17**	**0.35**	**0.06**	**0.27**	**18.06**	**0**	**1.11**
Shorebirds	**0.47**	**0.17**	**0.59**	**0.39**	**0.29**	**2.28**	**0.20**	**0.31**	**0.71**	**0.28**	**0.29**	**0.38**	**0.60**	**1.61**	**0.06**	**0.72**
Gulls/Terns	**33.65**	**0**	**0**	**0**	**3.65**	**0**	**0**	**0**	**0.06**	**0**	**0**	**1.25**	**0**	**0**	**5**	**0**
Diurnal Raptors	**0.18**	**0.22**	**0.12**	**0.39**	**0.12**	**0.22**	**0.33**	**0.38**	**0.12**	**0.50**	**0.24**	**0.38**	**0.47**	**0.33**	**0.38**	**0.39**
Accipiters	*0*	*0*	*0*	*0*	*0.06*	*0*	*0.07*	*0*	*0*	*0.06*	*0*	*0*	*0*	*0.06*	*0*	*0.06*
Buteos	*0.12*	*0.17*	*0*	*0.28*	*0*	*0.22*	*0.27*	*0.19*	*0.12*	*0.39*	*0.18*	*0.38*	*0.47*	*0.22*	*0.25*	*0.17*
Northern Harrier	*0.06*	*0*	*0.06*	*0.11*	*0.06*	*0*	*0*	*0.12*	*0*	*0.06*	*0*	*0*	*0*	*0.06*	*0*	*0.11*
Eagles	*0*	*0.06*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Falcons	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.06*	*0*	*0*	*0*	*0*	*0.06*
Other Raptors	*0*	*0*	*0.06*	*0*	*0*	*0*	*0*	*0.06*	*0*	*0*	*0*	*0*	*0*	*0*	*0.12*	*0*
Vultures	**0**	**0.11**	**0**	**0.17**	**0.06**	**0.17**	**0**	**0**	**0.06**	**0.06**	**0**	**0.25**	**0**	**0.06**	**0**	**0.17**
Upland Game Birds	**0.29**	**0.11**	**0.18**	**0.17**	**0.12**	**0.06**	**0.07**	**0.12**	**0.18**	**0.33**	**0**	**0.06**	**0.07**	**0.67**	**1.69**	**0**
Doves/Pigeons	**0.41**	**0.06**	**0.06**	**0.61**	**1**	**0.83**	**0.47**	**0.81**	**0.29**	**3.78**	**0.53**	**0.81**	**0.6**	**1.28**	**0.19**	**2.06**
Large Corvids	**0**	**0**	**0.35**	**0.06**	**0.47**	**0**	**0.13**	**0**	**0.18**	**0**	**0.06**	**0.06**	**0.07**	**0.11**	**1.75**	**0.83**
Goatsuckers	**0**	**0**	**0**	**0**	**0.06**	**0**	**0.07**	**0.06**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Overall large birds	**73.35**	**12.44**	**1.41**	**2.06**	**5.88**	**34.11**	**3.27**	**31.56**	**1.59**	**5.11**	**1.47**	**3.25**	**2.07**	**22.17**	**9.06**	**5.28**
Passerines	**14.71**	**10.39**	**5.35**	**12.28**	**6.06**	**28**	**7.93**	**4.94**	**11.47**	**8.44**	**4**	**7.81**	**7.4**	**3.17**	**10.19**	**13.44**
Woodpeckers	**0.06**	**0.06**	**0**	**0.06**	**0.06**	**0.28**	**0.07**	**0**	**0.35**	**0.06**	**0**	**0.12**	**0**	**0.22**	**0.06**	**0.06**
Overall small birds	**14.76**	**10.44**	**5.35**	**12.33**	**6.12**	**28.28**	**8.00**	**4.94**	**11.82**	**8.50**	**4.00**	**7.94**	**7.40**	**3.39**	**10.25**	**13.50**

[a.] 800-m (m; 2,625-foot [ft]) radius plot for large birds; 100-m (328-ft) radius plot for small birds

Eagle Use and Flight Paths

Overall, there were 271 hours (16,260 min) of eagle fixed-point use surveys (60-min surveys) conducted at the Project (Table 8). During this time, four bald eagles (only eagle species recorded) were visible for 15 min regardless of behavior (e.g., perching, flying, etc); 11 of those total minutes were risk minutes (i.e., within 800 m and below 200 m; Table 8). The bald eagles recorded at points 6 and 14 were observed after the initial 20-min survey period. The individual recorded at Point 14 was perched when first observed, and then flew within 800 m and below 200 m (Figure 4); this individual was not included in Tables 5 and 6 due to its behavior when first observed, but was included in the eagle risk minutes analysis (Table 8). Of the two bald eagles recorded at Point 2, one was observed after the initial 20-min survey period. The few flight paths for bald eagles at the Project showed no apparent pattern (Figure 3).

Table 8. Survey effort, number of bald eagle observations and groups, total eagle minutes, risk minutes, and eagle use by season, observed during the Year One of the 60-min bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

Season	Survey Effort (hours)	Number of Eagle Observations	Number of Groups	Total Eagle Minutes	Risk Minutes[a]	Eagle Use[b]
Spring	63	0	0	0	0	0
Summer	77	1	1	5	5	0.01
Fall	78	2	2	8	5	0.02
Winter	53	1	1	2	1	0.02
Overall	**271**	**4**	**4**	**15**	**11**	

[a.] Where eagles flew below 200 meters (m) above ground level and within 800 m of the observer

[b.] Eagles/800-m plot/60 minutes

Available upon request.

Incidental Observations

Sixteen unique bird species and two unidentified species were observed incidentally at the Project, totaling 2,153 birds within 73 separate groups (Table 9). Sandhill crane (1,054 birds within eight groups) and snow goose (950 birds within three groups) were the most abundant incidental species observed at the Project (Table 9). Eight unique and two unidentified diurnal raptor species were recorded incidentally, totaling 51 observations within 47 groups. Red-tailed hawk was the most abundant raptor species observed incidentally at the Project (29 birds within 27 groups); ferruginous hawk, sharp-shinned hawk, great horned owl (*Bubo virginianus*), and snowy owl (*Bubo scandiacus*) were only observed incidentally within the Project area.

Table 9. Incidental wildlife observed while conducting all surveys at the at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

Species	Scientific Name	#Groups	# Individuals
sandhill crane	*Antigone canadensis*	8	1,054
snow goose	*Chen caerulescens*	3	950
Franklin's gull	*Leucophaeus pipixcan*	1	75
bald eagle	*Haliaeetus leucocephalus*	2	3
Cooper's hawk	*Accipiter cooperii*	1	1
ferruginous hawk[a]	*Buteo regalis*	1	1
northern harrier	*Circus cyaneus*	7	8
rough-legged hawk	*Buteo lagopus*	1	1
red-tailed hawk	*Buteo jamaicensis*	27	29
sharp-shinned hawk[a]	*Accipiter striatus*	1	1
Swainson's hawk	*Buteo swainsoni*	2	2
unidentified buteo	*Buteo spp*	1	1
unidentified hawk		4	4
great horned owl[a]	*Bubo virginianus*	1	1
snowy owl[a]	*Bubo scandiacus*	1	1
turkey vulture	*Cathartes aura*	8	13
wild turkey	*Meleagris gallopavo*	2	5
American crow	*Corvus brachyrhynchos*	2	3
Total		**73**	**2,153**

[a.] Observed incidentally only

DISCUSSION

The Guidelines use a tiered approach to assess impacts to species and their habitats, and avian use surveys are one of a suite of Tier 3 studies used to inform risk at the Project. Tier 3 studies were targeted to address questions regarding impact that could not be sufficiently addressed using available literature (i.e., Tiers 1 and 2 desktop analyses). These studies provide additional data that, when combined with available literature reviewed in previous Tiers, allow for a confident assessment of the risk of significant population-level adverse impacts to special-status species; identify measures to mitigate significant adverse impacts, if necessary; and/or identify a need for more field studies, if the current survey effort did not provide sufficient data to adequately characterize the potential for significant adverse impacts to such species. While the avian use surveys reported herein were conducted across all species observed, the report focuses on a smaller group of species – diurnal raptors, eagles, listed species, and State non-listed special-status species.

The impact of wind energy development on birds can be direct or indirect. Direct impacts include fatalities or injury associated with facility infrastructure and the loss of habitat where infrastructure is placed. Indirect impacts include the displacement of wildlife and rendering habitat unsuitable through fragmentation of the landscape.

The focus of this study was mainly to document large bird use with an emphasis on eagles and diurnal raptors. Approximately two thirds of all bird observations during this study were waterfowl or passerine species. The most common waterfowl species were snow and Canada geese, while the most common passerine species were European starling and red-winged blackbird. Waterbirds composed a small percentage of the total bird observations, with only two waterbird species (sandhill cranes and great blue herons) being recorded during bird use surveys. Relatively few (89 observations) diurnal raptors were observed during standardized surveys and 51 were recorded incidentally. The most common diurnal raptor species recorded was red-tailed hawk, documented both incidentally and during scheduled surveys; bald eagle was the only eagle species documented during surveys conducted at the Project. Diurnal raptors and non-listed special-status species are discussed in more detail below; no federally or state-listed species were documented during the Year One survey period.

Diurnal Raptors

Annual mean diurnal raptor use at the Project was 0.31 raptors/800-m plot/20-min survey, with highest use in the fall, likely from an influx of migrating raptors. Mean raptor use was compared with other wind energy facilities that implemented similar protocols and had data covering similar seasons, ranking 34th from the highest use compared to the 47 other wind energy facilities in North America (Figure 4).

Publicly available data containing both mean raptor use and raptor fatality information in the Midwest is scarce, while data having this information for four seasons is even rarer (Table 10). The Beethoven Project, immediately adjacent to the Project, had a mean raptor use of 0.103 raptors/800-m plot/20-min survey (Derby and Thorn 2014) and a raptor fatality rate of 0.07 fatalities/MW/year (WEST 2016; Table 10). The Wessington Springs Project, approximately 80 miles north of the project, in South Dakota had a mean raptor use of 0.23 raptors/800-m plot/20-min survey and raptor fatality rates of 0.06 and 0.07 fatalities/MW/year during two separate years of fatality monitoring (Derby et al. 2010f, 2011d). Raptor fatality rates reported at other South Dakota wind energy facilities have ranged from 0 – 0.20 fatalities/MW/year (Table 10). Raptor fatality rates throughout the Midwest have ranged from zero at numerous facilities to 0.47 fatalities/MW/year at Buffalo Ridge, Phase I (Johnson et al. 2000a).

In the Midwest states, 55 diurnal raptor fatalities representing seven species have been documented at wind energy facilities in publicly available fatality studies. Red-tailed hawks represented most of the fatalities (38 fatalities; 69.1% of raptor fatalities), followed by American kestrel (five fatalities; 9.1% of raptor fatalities), sharp-shinned hawk (four fatalities; 7.3% of raptor fatalities), rough-legged hawk (three fatalities; 5.5% of raptor fatalities), and Cooper's hawk (two fatalities; 3.6% of raptor fatalities). Each of the remaining species (merlin [*Falco columbarius*], Swainson's hawk, and unidentified raptor) accounted for one fatality each. These are unadjusted, raw data. Cumulative fatalities and species are from data compiled by WEST from publicly available fatality studies (a list of facilities and references are available from WEST). Based on the currently available data, raptor fatality rates in the Project will likely be similar to other wind energy facilities in the Midwest that also have low raptor use and are likely to consist of the relatively common and widespread species documented in this survey.

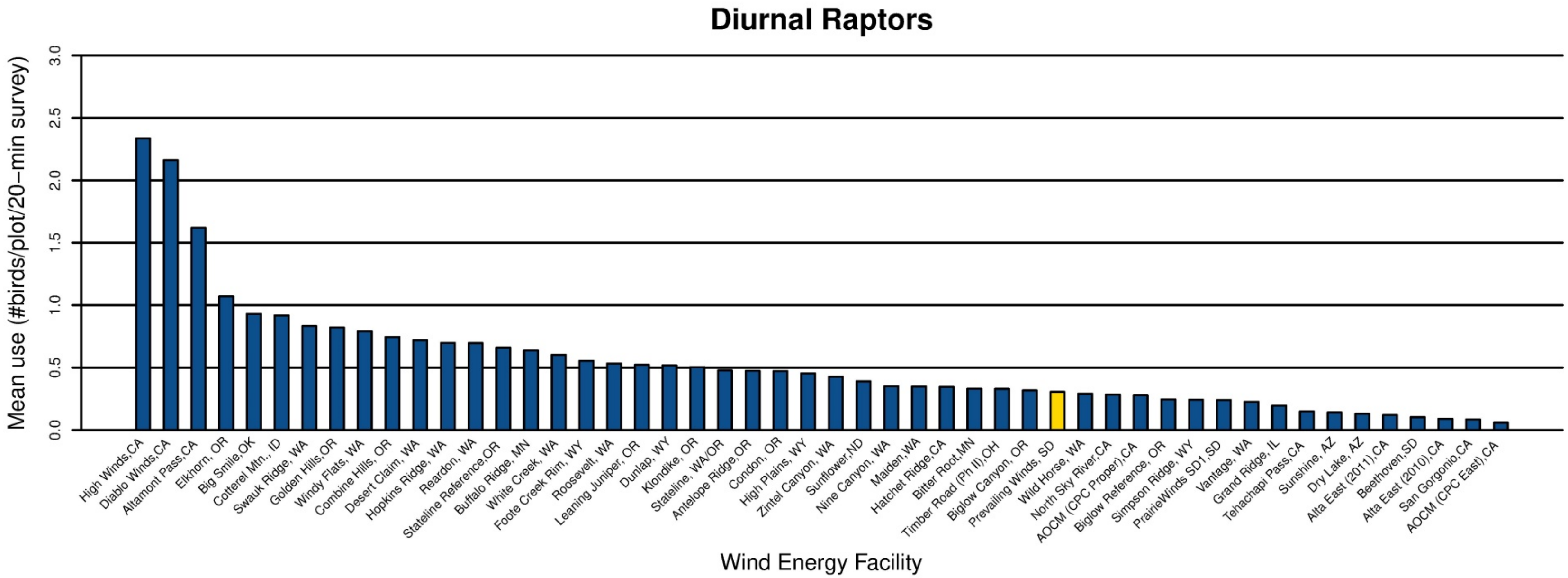

Figure 4. Comparison of estimated annual diurnal raptor use during the Year One fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016, and diurnal raptor use at other US wind resource areas with comparable raptor use data.

Data from the following sources:

Study and Location	Reference	Study and Location	Reference	Study and Location	Reference
Prevailing Winds, SD	This study.				
High Winds, CA	Kerlinger et al. 2005	Foote Creek Rim, WY	Johnson et al. 2000b	Wild Horse, WA	Erickson et al. 2003d
Diablo Winds, CA	WEST 2006	Roosevelt, WA	NWC and WEST 2004	North Sky River, CA	Erickson et al. 2011
Altamont Pass, CA	Orloff and Flannery 1992	Leaning Juniper, OR	Kronner et al. 2005	AOCM (CPC Proper), CA	Chatfield et al. 2010
Elkhorn, OR	WEST 2005a	Dunlap, WY	Johnson et al. 2009a	Biglow Reference, OR	WEST 2005c
Big Smile (Dempsey), OK	Derby et al. 2010a	Klondike, OR	Johnson et al. 2002	Simpson Ridge, WY	Johnson et al. 2000b
Cotterel Mtn., ID	BLM 2006	Stateline, WA/OR	Erickson et al. 2003a	Vantage, WA	Jeffrey et al. 2007
Swauk Ridge, WA	Erickson et al. 2003b	Antelope Ridge, OR	WEST 2009	Grand Ridge, IL	Derby et al. 2009
Golden Hills, OR	Jeffrey et al. 2008	Condon, OR	Erickson et al. 2002b	Tehachapi Pass, CA	Anderson et al. 2000, Erickson et al. 2002b
Windy Flats, WA	Johnson et al. 2007	High Plains, WY	Johnson et al. 2009b	Sunshine, AZ	WEST and the CPRS 2006
Combine Hills, OR	Young et al. 2003c	Zintel Canyon, WA	Erickson et al. 2002a, 2003c	Dry Lake, AZ	Young et al. 2007b
Desert Claim, WA	Young et al. 2003b	Nine Canyon, WA	Erickson et al. 2001	Alta East (2011), CA	Chatfield et al. 2011
Hopkins Ridge, WA	Young et al. 2003a	Maiden, WA	Young et al. 2002	Alta East (2010), CA	Chatfield et al. 2011
Reardon, WA	WEST 2005b	Hatchet Ridge, CA	Young et al. 2007a	San Gorgonio, CA	Anderson et al. 2000, Erickson et al. 2002b
Stateline Reference, OR	URS et al. 2001	Bitter Root. MN	Derby and Dahl 2009	AOCM (CPC East), CA	Chatfield et al. 2010
Buffalo Ridge, MN	Johnson et al. 2000a	Timber Road (Phase II), OH	Good et al. 2010	Beethoven, SD	Derby and Thorn 2014
White Creek, WA	NWC and WEST 2005	Biglow Canyon, OR	WEST 2005c		

Table 10. Raptor use (number of raptors/plot/20-minute survey) and fatality (number of bird fatalities/megawatt/year) estimates for wind-energy facilities in the Midwest with publicly available data.

Project Name	Raptor Use Estimate	Raptor Fatality Estimate	Total #of Turbines	Total MW	Use Reference	Fatality Reference
Barton I & II, IA (2010-2011)	NA	0	80	160.0		Derby et al. 2011a
Beethoven (2016-2016)	0.103	0.07	43	80.0	Derby and Thorn 2014	WEST 2016
Big Blue, MN (2013)	NA	0	18	36.0		Fagen Engineering 2014
Big Blue, MN (2014)	NA	0	18	36.0		Fagen Engineering 2015
Blue Sky Green Field, WI (2008; 2009)	NA	0	88	145.0		Gruver et al. 2009
Buffalo Ridge I, SD (2009-2010)	NA	0.20	24	50.4		Derby et al. 2010b
Buffalo Ridge II, SD (2011-2012)	NA	0	105	210.0		Derby et al. 2012a
Buffalo Ridge, MN (Phase I; 1996)	NA	0	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase I; 1997)	NA	0	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase I; 1998)	NA	0	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase I; 1999)	NA	0.47	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase II; 1998)	NA	0	143	107.3		Johnson et al. 2000a
Buffalo Ridge, MN (Phase II; 1999)	NA	0	143	107.3		Johnson et al. 2000a
Buffalo Ridge, MN (Phase III; 1999)	NA	0	138	103.5		Johnson et al. 2000a
Cedar Ridge, WI (2009)	NA	0.18	41	67.6		BHE Environmental 2010
Cedar Ridge, WI (2010)	NA	0.13	41	68.0		BHE Environmental 2011
Elm Creek II, MN (2009-2010)	NA	0	67	100.0		Derby et al. 2010c
Elm Creek, MN (20011-2012)	NA	0	62	148.8		Derby et al. 2012b
Fowler I, IN (2009)	NA	0	162	301.0		Johnson et al. 2010
Grand Ridge I, IL (2009-2010)	0.2	0	66	99.0	Derby et al. 2009	Derby et al. 2010g
Kewaunee County, WI (1999-2001)	NA	0	31	20.5		Howe et al. 2002
Moraine II, MN (2009)	NA	0.37	33	49.5		Derby et al. 2010d
NPPD Ainsworth, NE (2006)	NA	0.06	36	20.5		Derby et al. 2007
Pioneer Prairie II, IA (2011-2012)	NA	0	62	102.3		Chodachek et al. 2012
PrairieWinds ND1 (Minot), ND (2010)	NA	0.05	80	115.5		Derby et al. 2011c
PrairieWinds ND1 (Minot), ND (2011)	NA	0.05	80	115.5		Derby et al. 2012c
PrairieWinds SD1, SD (2011-2012)	NA	0	108	162.0		Derby et al. 2012d
PrairieWinds SD1, SD (2012-2013)	NA	0.03	108	162.0		Derby et al. 2013
PrairieWinds SD1, SD (2013-2014)	NA	0.17	108	162.0		Derby et al. 2014
Rail Splitter, IL (2012-2013)	NA	0	67	100.5		Good et al. 2013
Ripley, Ont (2008)	NA	0.10	38	76.0		Jacques Whitford 2009
Rugby, ND (2010-2011)	NA	0.06	71	149.0		Derby et al. 2011b
Top of Iowa, IA (2003)	NA	0	89	80.0		Jain 2005
Top of Iowa, IA (2004)	NA	0.17	89	80.0		Jain 2005
Wessington Springs, SD (2009)	0.23	0.06	34	51.0	Derby et al. 2008	Derby et al. 2010f

Table 10. Raptor use (number of raptors/plot/20-minute survey) and fatality (number of bird fatalities/megawatt/year) estimates for wind-energy facilities in the Midwest with publicly available data.

Project Name	Raptor Use Estimate	Raptor Fatality Estimate	Total #of Turbines	Total MW	Use Reference	Fatality Reference
Wessington Springs, SD (2010)	0.23	0.07	34	51.0	Derby et al. 2008	Derby et al. 2011d
Winnebago, IA (2009-2010)	NA	0.27	10	20.0		Derby et al. 2010e

This fixed-point bird use survey was designed to provide a relative index of use by raptors during all seasons at the Project. While mean diurnal raptor use was higher during the fall (0.52 raptors/800-m plot/20-min survey), probably due to an influx of migrant birds, the Project is not located within a known raptor migration corridor, and there are no features unique to the Project area, compared to adjacent areas, that would appear to attract large numbers of diurnal raptors. Furthermore, raptor fatality rates reported from studies in the Midwest are typically low. Site-specific and regional data suggest there is some potential for raptor mortality, but these potential impacts to individuals are unlikely to cause significant adverse impacts to raptor populations. Likewise, there is some potential for habitat loss and displacement of individuals, but the resources available within the Project area are widely available at the local landscape level; therefore, any diurnal raptor habitat loss and displacement attributable to the Project is unlikely to result in significant adverse population-level impacts to raptors.

While abundance is intuitively connected to raptor fatality risk to some degree, risk is likely influenced by other factors as well, such as species-specific flight behaviors. More than half (58.2%) of all diurnal raptors at the Project were observed below the RSH. A higher proportion of unidentified raptors, buteos, and eagles flew within the RSH compared to other raptor types, potentially indicating that some species may have a higher risk for collision; however, many of these are based on a few individual observations.

Species Specific Summaries

Great blue heron

One great blue heron, a common summer resident and migrant in South Dakota, was recorded during the surveys conducted at the Project. Site-specific data indicate that use of the Project area by this species is low and population-level effects from Project development are unlikely.

Bald Eagle

A total of seven bald eagle observations (four during 60-min surveys and regardless of distance from observer, and three incidentally) were recorded within the Project area during Year One surveys conducted from March 25, 2015 – February 21, 2016 (Table 4). The majority (66.7%) of flying bald eagles recorded during fixed-point bird use surveys were observed within the RSH (Table 5). Bald eagles are generally uncommon during migration, summer, and winter throughout South Dakota; however, they are locally common below the Missouri River dams in winter and nesting within the State is increasingly reported (South Dakota Birds, Birding, and Nature 2017). An April 2015 raptor nest survey conducted by WEST found one occupied/active bald eagle nest recorded within one mi (1.6 km) of the Project boundary. There were also five occupied/active bald eagle nests, one occupied/active eagle nest (species unknown), and one unoccupied eagle nest (species unknown) recorded within or next to the 10-mi (16-km) buffer during the April 2015 raptor nest survey.

The limited eagle observations during this bird use survey and the raptor nest survey conducted in 2015 suggest that the Project does not fall within a major bald eagle migration route, wintering area, or breeding home range of current nests, but the presence of active bald eagle nests in the vicinity of the Project indicates bald eagles are present in the general area for an extended period of time (breeding season). Thus, development of the Project may influence individuals moving through or using the Project area, but potential impact to bald eagle populations appears minimal.

Swainson's and Ferruginous Hawk

There were four observations of Swainson's and one ferruginous hawk were recorded during the study period (Table 4). Seventy-five percent of the Swainson's hawk observations were of flying individuals, but none of those hawks were observed flying within the RSH (Table 6). Swainson's hawks are common in South Dakota and utilize a variety of habitats, including open grasslands with occasional trees and shrubs, wetland edges, and agriculture fields, nesting in trees, shrubs, or occasionally on the ground (South Dakota Birds, Birding, and Nature 2017). The one ferruginous hawk was not observed flying. Ferruginous hawk, an uncommon migrant and summer resident, is rarely observed in winter, and inhabits grasslands and open areas (South Dakota Birds, Birding, and Nature 2017).

The potential for individual mortality does exist for both species; however, the low number of fatalities reported throughout projects in the Midwest (one Swainson's hawk and no ferruginous hawk fatalities out of 55 total reported fatalities) suggests that these species are not particularly susceptible to turbine collisions. Collision mortality may affect a few individuals, but are unlikely to cause significant adverse impacts to either populations of the species.

Goshawk and Sharp-shinned and Cooper's Hawk

One goshawk, one sharp-shinned hawk and four Cooper's hawks were recorded during the study period. All are an uncommon migrant in South Dakota, generally preferring wooded areas (South Dakota Birds, Birding, and Nature 2017). Only two Cooper's hawks and no sharp-shinned or goshawks have been found as fatalities through projects in the Midwest. Collision mortality may affect a few individuals of these species, but significant population-level impacts are unlikely.

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Appendix A. Descriptive Statistics for Bird Species Recorded during Year One of Fixed-Point Bird Use Surveys Conducted at the Prairie Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year One fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

		Spring		Summer		Fall		Winter		Total	
Type/Species	Scientific Name	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs
Waterbirds		**4**	**701**	**0**	**0**	**1**	**35**	**0**	**0**	**5**	**736**
great blue heron[a]	*Ardea herodias*	1	1	0	0	0	0	0	0	1	1
sandhill crane	*Antigone canadensis*	3	700	0	0	1	35	0	0	4	735
Waterfowl		**21**	**725**	**6**	**53**	**4**	**321**	**13**	**1,046**	**44**	**2,145**
Canada goose	*Branta canadensis*	3	402	2	41	0	0	5	415	10	858
greater white-fronted goose	*Anser albifrons*	1	50	0	0	0	0	1	6	2	56
lesser scaup	*Aythya affinis*	1	6	0	0	0	0	0	0	1	6
mallard	*Anas platyrhynchos*	11	59	3	8	2	4	3	35	19	106
northern shoveler	*Anas clypeata*	1	2	0	0	1	17	0	0	2	19
snow goose	*Chen caerulescens*	0	0	0	0	0	0	4	590	4	590
unidentified duck		4	206	0	0	0	0	0	0	4	206
unidentified goose		0	0	0	0	1	300	0	0	1	300
wood duck	*Aix sponsa*	0	0	1	4	0	0	0	0	1	4
Shorebirds		**31**	**34**	**32**	**76**	**11**	**52**	**0**	**0**	**74**	**162**
killdeer	*Charadrius vociferus*	24	27	13	23	6	10	0	0	43	60
unidentified shorebird		0	0	4	36	5	42	0	0	9	78
upland sandpiper	*Bartramia longicauda*	7	7	15	17	0	0	0	0	22	24
Gulls/Terns		**4**	**693**	**0**	**0**	**2**	**42**	**0**	**0**	**6**	**735**
Franklin's gull	*Leucophaeus pipixcan*	4	693	0	0	1	20	0	0	5	713
unidentified gull		0	0	0	0	1	22	0	0	1	22
Diurnal Raptors		**9**	**10**	**14**	**14**	**41**	**45**	**19**	**20**	**83**	**89**
Accipiters		*0*	*0*	*0*	*0*	*2*	*2*	*3*	*3*	*5*	*5*
Cooper's hawk[a]	*Accipiter cooperii*	0	0	0	0	2	2	2	2	4	4
northern goshawk[a,b]	*Accipiter gentilis*	0	0	0	0	0	0	1	1	1	1
Buteos		*6*	*7*	*8*	*8*	*30*	*34*	*13*	*14*	*57*	*63*
red-tailed hawk	*Buteo jamaicensis*	6	7	8	8	28	30	9	10	51	55
rough-legged hawk	*Buteo lagopus*	0	0	0	0	0	0	3	3	3	3
Swainson's hawk[a]	*Buteo swainsoni*	0	0	0	0	2	4	0	0	2	4
unidentified buteo	*Buteo spp*	0	0	0	0	0	0	1	1	1	1
Northern Harrier		*2*	*2*	*4*	*4*	*5*	*5*	*0*	*0*	*11*	*11*
northern harrier	*Circus cyaneus*	2	2	4	4	5	5	0	0	11	11
Eagles		*0*	*0*	*0*	*0*	*0*	*0*	*1*	*1*	*1*	*1*
bald eagle[a,b,c]	*Haliaeetus leucocephalus*	0	0	0	0	0	0	1	1	1	1

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year One fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

		Spring		Summer		Fall		Winter		Total	
Type/Species	Scientific Name	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs
Falcons		*0*	*0*	*0*	*0*	*0*	*0*	*2*	*2*	*2*	*2*
American kestrel	*Falco sparverius*	0	0	0	0	0	0	2	2	2	2
Other Raptors		*1*	*1*	*2*	*2*	*4*	*4*	*0*	*0*	*7*	*7*
unidentified hawk		1	1	1	1	2	2	0	0	4	4
unidentified raptor		0	0	1	1	2	2	0	0	3	3
Vultures		**2**	**2**	**3**	**9**	**5**	**8**	**0**	**0**	**10**	**19**
turkey vulture	*Cathartes aura*	2	2	3	9	5	8	0	0	10	19
Upland Game Birds		**12**	**14**	**13**	**13**	**4**	**26**	**4**	**16**	**33**	**69**
gray partridge	*Perdix perdix*	0	0	0	0	0	0	1	5	1	5
ring-necked pheasant	*Phasianus colchicus*	11	13	12	12	3	3	2	2	28	30
sharp-tailed grouse	*Tympanuchus phasianellus*	1	1	0	0	0	0	0	0	1	1
wild turkey	*Meleagris gallopavo*	0	0	1	1	1	23	1	9	3	33
Doves/Pigeons		**12**	**16**	**37**	**55**	**17**	**105**	**8**	**63**	**74**	**239**
Eurasian collared-dove	*Streptopelia decaocto*	0	0	1	1	0	0	0	0	1	1
mourning dove	*Zenaida macroura*	10	13	35	53	14	80	0	0	59	146
rock pigeon	*Columba livia*	2	3	1	1	3	25	8	63	14	92
Large Corvids		**6**	**6**	**1**	**2**	**12**	**33**	**6**	**27**	**25**	**68**
American crow	*Corvus brachyrhynchos*	6	6	1	2	12	33	6	27	25	68
Passerines		**158**	**370**	**217**	**623**	**129**	**2,116**	**28**	**781**	**532**	**3,890**
American goldfinch	*Spinus tristis*	1	1	5	5	1	1	0	0	7	7
American robin	*Turdus migratorius*	22	47	10	15	10	75	0	0	42	137
Baltimore oriole	*Icterus galbula*	0	0	1	1	0	0	0	0	1	1
bank swallow	*Riparia riparia*	0	0	0	0	1	4	0	0	1	4
barn swallow	*Hirundo rustica*	3	10	39	98	10	61	0	0	52	169
blue jay	*Cyanocitta cristata*	0	0	0	0	2	3	0	0	2	3
bobolink	*Dolichonyx oryzivorus*	1	1	4	4	0	0	0	0	5	5
Brewer's blackbird	*Euphagus cyanocephalus*	0	0	0	0	1	150	0	0	1	150
brown-headed cowbird	*Molothrus ater*	20	96	19	47	3	23	0	0	42	166
brown thrasher	*Toxostoma rufum*	1	1	1	1	0	0	0	0	2	2
chipping sparrow	*Spizella passerina*	1	1	0	0	0	0	0	0	1	1
cliff swallow	*Petrochelidon pyrrhonota*	0	0	4	16	0	0	0	0	4	16
common grackle	*Quiscalus quiscula*	11	22	6	7	3	14	0	0	20	43
common yellowthroat	*Geothlypis trichas*	0	0	2	2	0	0	0	0	2	2
dark-eyed junco	*Junco hyemalis*	0	0	0	0	0	0	1	30	1	30

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year One fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

		Spring		Summer		Fall		Winter		Total	
Type/Species	Scientific Name	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs	# Grps	# Obs
dickcissel	*Spiza americana*	0	0	15	18	0	0	0	0	15	18
eastern bluebird	*Sialia sialis*	1	1	0	0	1	4	0	0	2	5
eastern kingbird	*Tyrannus tyrannus*	0	0	23	34	0	0	0	0	23	34
European starling	*Sturnus vulgaris*	2	2	1	19	8	553	2	213	13	787
field sparrow	*Spizella pusilla*	0	0	0	0	0	0	3	11	3	11
grasshopper sparrow	*Ammodramus savannarum*	1	2	0	0	0	0	0	0	1	2
Harris' sparrow	*Zonotrichia querula*	0	0	0	0	1	1	0	0	1	1
horned lark	*Eremophila alpestris*	9	14	1	2	5	69	15	402	30	487
house wren	*Troglodytes aedon*	0	0	0	0	1	1	0	0	1	1
Lapland longspur	*Calcarius lapponicus*	0	0	0	0	0	0	2	40	2	40
loggerhead shrike	*Lanius ludovicianus*	1	2	0	0	0	0	0	0	1	2
northern rough-winged swallow	*Stelgidopteryx serripennis*	0	0	1	2	0	0	0	0	1	2
orchard oriole	*Icterus spurius*	0	0	1	2	0	0	0	0	1	2
red-winged blackbird	*Agelaius phoeniceus*	16	85	15	138	11	351	0	0	42	574
Savannah sparrow	*Passerculus sandwichensis*	0	0	7	9	3	5	0	0	10	14
snow bunting	*Plectrophenax nivalis*	0	0	0	0	0	0	2	23	2	23
song sparrow	*Melospiza melodia*	0	0	1	1	3	13	0	0	4	14
tree swallow	*Tachycineta bicolor*	0	0	5	6	0	0	0	0	5	6
unidentified blackbird		0	0	1	1	5	659	0	0	6	660
unidentified passerine		2	3	2	24	8	15	1	7	13	49
unidentified sparrow		0	0	0	0	8	20	0	0	8	20
unidentified swallow		1	1	2	45	0	0	0	0	3	46
vesper sparrow	*Pooecetes gramineus*	3	3	1	1	0	0	0	0	4	4
western kingbird	*Tyrannus verticalis*	0	0	4	6	0	0	0	0	4	6
western meadowlark	*Sturnella neglecta*	62	78	44	68	43	93	2	55	151	294
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	0	0	2	51	0	0	0	0	2	51
yellow warbler	*Setophaga petechia*	0	0	0	0	1	1	0	0	1	1
Goatsuckers		**0**	**0**	**3**	**3**	**0**	**0**	**0**	**0**	**3**	**3**
common nighthawk	*Chordeiles minor*	0	0	3	3	0	0	0	0	3	3
Woodpeckers		**8**	**8**	**6**	**7**	**6**	**9**	**4**	**7**	**24**	**31**
hairy woodpecker	*Picoides villosus*	1	1	0	0	0	0	0	0	1	1
northern flicker	*Colaptes auratus*	7	7	4	4	5	8	4	7	20	26

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year One fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

		Spring		Summer		Fall		Winter		Total	
Type/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
red-headed woodpecker	*Melanerpes erythrocephalus*	0	0	2	3	1	1	0	0	3	4
Unidentified Birds		**0**	**0**	**0**	**0**	**0**	**0**	**1**	**8**	**1**	**8**
unidentified bird (small)		0	0	0	0	0	0	1	8	1	8
Overall		**267**	**2579**	**332**	**855**	**232**	**2,792**	**83**	**1,968**	**914**	**8,194**

Grps = Number of groups, # Obs = Number of observations

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

[b.] State Species of Greatest Conservation Need (SDGFP 2014)

[c.] Bald and Golden Eagle Protection Act (1940)

Appendix A2. Mean large bird use (number of large birds/800-meter radius plot/20-minute survey), percent of total use, and frequency of occurrence for each large bird type and species by season during Year One of the fixed-point bird use surveys conducted at the Prairie Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

	Mean Use				**Percent of Use (%)**				**Frequency of Occurrence (%)**			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Waterbirds	**10.17**	**0**	**0.44**	**0**	**33.4**	**0**	**5.2**	**0**	**3.2**	**0**	**1.2**	**0**
great blue heron[a]	0.02	0	0	0	<0.1	0	0	0	1.7	0	0	0
sandhill crane	10.16	0	0.44	0	33.4	0	5.2	0	1.6	0	1.2	0
Waterfowl	**8.21**	**0.18**	**4.01**	**11.66**	**27**	**7.6**	**47.6**	**80.1**	**22.1**	**5.5**	**5.2**	**7.8**
Canada goose	6.28	0.01	0	3.36	20.6	0.5	0	23.1	3.1	1.2	0	6.2
greater white-fronted goose	0.78	0	0	0.09	2.6	0	0	0.6	1.6	0	0	1.6
lesser scaup	0.09	0	0	0	0.3	0	0	0	1.6	0	0	0
mallard	0.92	0.11	0.05	0.55	3	4.8	0.6	3.8	17.2	4.3	2.7	4.7
northern shoveler	0.03	0	0.21	0	0.1	0	2.5	0	1.7	0	1.2	0
snow goose	0	0	0	7.66	0	0	0	52.6	0	0	0	3.1
unidentified duck	0.09	0	0	0	0.3	0	0	0	4.8	0	0	0
unidentified goose	0	0	3.75	0	0	0	44.5	0	0	0	1.2	0
wood duck	0	0.06	0	0	0	2.4	0	0	0	1.4	0	0
Shorebirds	**0.54**	**0.98**	**0.65**	**0**	**1.8**	**40.7**	**7.7**	**0**	**41**	**35.5**	**12.5**	**0**
killdeer	0.43	0.3	0.12	0	1.4	12.6	1.5	0	34.8	16	7.5	0
unidentified shorebird	0	0.45	0.52	0	0	18.7	6.2	0	0	3.8	5	0
upland sandpiper	0.11	0.22	0	0	0.4	9.3	0	0	9.4	18.7	0	0
Gulls/Terns	**10.83**	**0**	**0.56**	**0**	**35.6**	**0**	**6.7**	**0**	**6.2**	**0**	**2.7**	**0**
Franklin's gull	10.83	0	0.25	0	35.6	0	3	0	6.2	0	1.2	0
unidentified gull	0	0	0.31	0	0	0	3.7	0	0	0	1.4	0
Diurnal Raptors	**0.10**	**0.18**	**0.52**	**0.45**	**0.3**	**7.4**	**6.1**	**3.1**	**7.9**	**13.9**	**35.9**	**37.4**
Accipiters	*0*	*0*	*0.03*	*0.10*	*0*	*0*	*0.3*	*0.7*	*0*	*0*	*2.7*	*10*
Cooper's hawk[a]	0	0	0.03	0.06	0	0	0.3	0.4	0	0	2.7	5.8
northern goshawk[a,b]	0	0	0	0.04	0	0	0	0.3	0	0	0	4.2
Buteos	*0.05*	*0.10*	*0.41*	*0.30*	*0.2*	*4.2*	*4.9*	*2.1*	*4.7*	*8.9*	*32*	*24.2*
red-tailed hawk	0.05	0.10	0.36	0.21	0.2	4.2	4.2	1.4	4.7	8.9	29.3	15.2
rough-legged hawk	0	0	0	0.07	0	0	0	0.5	0	0	0	7.4
Swainson's hawk[a]	0	0	0.06	0	0	0	0.7	0	0	0	2.7	0
unidentified buteo	0	0	0	0.02	0	0	0	0.1	0	0	0	1.6
Northern Harrier	*0.03*	*0.05*	*0.06*	*0*	*0.1*	*2.1*	*0.8*	*0*	*3.2*	*5*	*6.4*	*0*
northern harrier	0.03	0.05	0.06	0	0.1	2.1	0.8	0	3.2	5	6.4	0
Eagles	*0*	*0*	*0*	*0.02*	*0*	*0*	*0*	*0.1*	*0*	*0*	*0*	*1.6*
bald eagle[a,b,c]	0	0	0	0.02	0	0	0	0.1	0	0	0	1.6
Falcons	*0*	*0*	*0*	*0.03*	*0*	*0*	*0*	*0.2*	*0*	*0*	*0*	*3.3*

Appendix A2. Mean large bird use (number of large birds/800-meter radius plot/20-minute survey), percent of total use, and frequency of occurrence for each large bird type and species by season during Year One of the fixed-point bird use surveys conducted at the Prairie Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

	Mean Use				Percent of Use (%)				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
American kestrel	0	0	0	0.03	0	0	0	0.2	0	0	0	3.3
Other Raptors	*0.02*	*0.02*	*0.01*	*0*	*<0.1*	*1*	*0.2*	*0*	*1.7*	*2.5*	*1.4*	*0*
unidentified hawk	0.02	0.01	0.01	0	<0.1	0.5	0.2	0	1.7	1.2	1.4	0
unidentified raptor	0	0.01	0	0	0	0.5	0	0	0	1.2	0	0
Vultures	**0.03**	**0.12**	**0.10**	**0**	**0.1**	**5.1**	**1.2**	**0**	**3.1**	**4.1**	**6.4**	**0**
turkey vulture	0.03	0.12	0.10	0	0.1	5.1	1.2	0	3.1	4.1	6.4	0
Upland Game Birds	**0.22**	**0.17**	**0.33**	**0.64**	**0.7**	**7.2**	**3.9**	**4.4**	**17.4**	**17.4**	**5.2**	**10.0**
gray partridge	0	0	0	0.21	0	0	0	1.4	0	0	0	4.2
ring-necked pheasant	0.21	0.16	0.04	0.06	0.7	6.6	0.5	0.4	17.4	16	3.9	5.8
sharp-tailed grouse	0.02	0	0	0	<0.1	0	0	0	1.6	0	0	0
wild turkey	0	0.01	0.29	0.38	0	0.6	3.4	2.6	0	1.4	1.2	4.2
Doves/Pigeons	**0.25**	**0.70**	**1.41**	**1.37**	**0.8**	**29.3**	**16.7**	**9.4**	**17.2**	**41.0**	**17.3**	**17.8**
Eurasian collared-dove	0	0.01	0	0	0	0.5	0	0	0	1.2	0	0
mourning dove	0.20	0.68	1.09	0	0.7	28.2	13	0	14.1	41	16.1	0
rock pigeon	0.05	0.01	0.31	1.37	0.2	0.5	3.7	9.4	3.1	1.2	3.8	17.8
Large Corvids	**0.09**	**0.02**	**0.41**	**0.44**	**0.3**	**1**	**4.9**	**3**	**9.4**	**1.2**	**12.5**	**9.7**
American crow	0.09	0.02	0.41	0.44	0.3	1	4.9	3	9.4	1.2	12.5	9.7
Goatsuckers	**0**	**0.04**	**0**	**0**	**0**	**1.7**	**0**	**0**	**0**	**4**	**0**	**0**
common nighthawk	0	0.04	0	0	0	1.7	0	0	0	4	0	0
Overall	**30.43**	**2.40**	**8.43**	**14.56**	**100**	**100**	**100**	**100**				

Note: Totals by bird type and overall might not correspond to the sum of individual species due to rounding

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

[b.] State Species of Greatest Conservation Need (SDGFP 2014)

[c.] Bald and Golden Eagle Protection Act (1940)

Appendix A3. Mean small bird use (number of large birds/100-meter plot/20-minute survey), percent of total use, and frequency of occurrence for each small bird type and species by season during Year One of the fixed-point bird use surveys conducted at the Prairie Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

	Mean Use				Percent of Use (%)				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Passerines	**5.88**	**6.83**	**15.59**	**11.48**	**97.9**	**99.1**	**99.2**	**99.6**	**90.6**	**90.0**	**65.0**	**39.6**
American goldfinch	0.02	0.07	0.01	0	0.3	1	<0.1	0	1.6	6.6	1.2	0
American robin	0.76	0.2	0.91	0	12.6	2.9	5.8	0	31.9	12	7.7	0
Baltimore oriole	0	0.01	0	0	0	0.2	0	0	0	1.4	0	0
bank swallow	0	0	0.05	0	0	0	0.3	0	0	0	1.2	0
barn swallow	0.16	1.06	0.79	0	2.6	15.4	5	0	4.7	34	10.7	0
blue jay	0	0	0.04	0	0	0	0.2	0	0	0	2.5	0
bobolink	0.02	0.06	0	0	0.3	0.8	0	0	1.6	5.5	0	0
Brewer's blackbird	0	0	1.88	0	0	0	11.9	0	0	0	1.2	0
brown-headed cowbird	1.52	0.61	0.16	0	25.4	8.9	1	0	28.8	23.3	2.7	0
brown thrasher	0.02	0.01	0	0	0.3	0.2	0	0	1.6	1.4	0	0
chipping sparrow	0.02	0	0	0	0.3	0	0	0	1.6	0	0	0
cliff swallow	0	0.20	0	0	0	2.9	0	0	0	5	0	0
common grackle	0.35	0.10	0.18	0	5.8	1.4	1.1	0	12.6	8.3	3.8	0
common yellowthroat	0	0.03	0	0	0	0.4	0	0	0	2.7	0	0
dark-eyed junco	0	0	0	1.25	0	0	0	10.8	0	0	0	4.2
dickcissel	0	0.23	0	0	0	3.4	0	0	0	19.6	0	0
eastern bluebird	0.02	0	0.05	0	0.3	0	0.3	0	1.6	0	1.2	0
eastern kingbird	0	0.38	0	0	0	5.5	0	0	0	23.5	0	0
European starling	0.03	0.24	1.07	0	0.5	3.4	6.8	0	1.6	1.2	3.9	0
field sparrow	0	0	0	0.17	0	0	0	1.5	0	0	0	4.7
grasshopper sparrow	0.03	0	0	0	0.5	0	0	0	1.6	0	0	0
Harris' sparrow	0	0	0.01	0	0	0	<0.1	0	0	0	1.2	0
horned lark	0.22	0.03	0.87	7.15	3.7	0.4	5.5	62	14.2	1.3	5.4	27.5
house wren	0	0	0.01	0	0	0	<0.1	0	0	0	1.4	0
Lapland longspur	0	0	0	1.17	0	0	0	10.1	0	0	0	5.8
loggerhead shrike	0.03	0	0	0	0.6	0	0	0	1.7	0	0	0
northern rough-winged swallow	0	0.03	0	0	0	0.4	0	0	0	1.3	0	0
orchard oriole	0	0.03	0	0	0	0.4	0	0	0	1.4	0	0
red-winged blackbird	1.37	1.54	2.31	0	22.9	22.3	14.7	0	22.1	17.7	9.3	0
Savannah sparrow	0	0.12	0.06	0	0	1.7	0.4	0	0	9.5	2.7	0

Appendix A3. Mean small bird use (number of large birds/100-meter plot/20-minute survey), percent of total use, and frequency of occurrence for each small bird type and species by season during Year One of the fixed-point bird use surveys conducted at the Prairie Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from March 25, 2015 – February 21, 2016.

	Mean Use				Percent of Use (%)				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
snow bunting	0	0	0	0.88	0	0	0	7.7	0	0	0	5.8
song sparrow	0	0.01	0.16	0	0	0.2	1	0	0	1.2	3.9	0
tree swallow	0	0.06	0	0	0	0.9	0	0	0	3.8	0	0
unidentified blackbird	0	0.01	5.5	0	0	0.2	35	0	0	1.2	2.5	0
unidentified passerine	0.05	0.3	0.2	0	0.8	4.4	1.3	0	3.2	2.6	9.3	0
unidentified sparrow	0	0	0.17	0	0	0	1.1	0	0	0	6.6	0
unidentified swallow	0.02	0	0	0	0.3	0	0	0	1.7	0	0	0
vesper sparrow	0.05	0.01	0	0	0.8	0.2	0	0	3.1	1.4	0	0
western kingbird	0	0.04	0	0	0	0.6	0	0	0	2.6	0	0
western meadowlark	1.22	0.68	1	0.86	20.3	9.8	6.4	7.5	74.6	44.7	35	3.1
yellow-headed blackbird	0	0.68	0	0	0	9.9	0	0	0	2.8	0	0
yellow warbler	0	0	0.01	0	0	0	<0.1	0	0	0	1.4	0
Woodpeckers	**0.12**	**0.07**	**0.12**	**0.05**	**2.1**	**0.9**	**0.8**	**0.4**	**10.9**	**5.3**	**6.6**	**3.3**
hairy woodpecker	0.02	0	0	0	0.3	0	0	0	1.6	0	0	0
northern flicker	0.11	0.05	0.11	0.05	1.8	0.8	0.7	0.4	10.9	5.3	5.4	3.3
red-headed woodpecker	0	0.01	0.01	0	0	0.2	<0.1	0	0	1.2	1.2	0
Overall	**6.01**	**6.90**	**15.71**	**11.53**	**100**	**100**	**100**	**100**				

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

APPENDIX G - AVIAN USE SURVEYS, YEAR TWO

Avian Use Surveys for the Prevailing Winds Wind Project Bon Homme and Charles Mix Counties, South Dakota

Year Two Final Draft Report

May 2016 – April 2017

Prepared for:

Prevailing Winds, LLC

Prepared by:

Clayton Derby, Sofia Agudelo, and Terri Thorn

Western EcoSystems Technology, Inc.
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February 16, 2018

EXECUTIVE SUMMARY

Prevailing Winds, LLC. (Prevailing Winds), has proposed a wind energy facility in Bon Homme and Charles Mix counties, South Dakota, referred to as the Prevailing Winds Wind Project (Project). Prevailing Winds contracted Western EcoSystems Technology, Inc. (WEST) to conduct field surveys developed in coordination with the US Fish and Wildlife Service (USFWS) and South Dakota Game Fish and Parks (SDGFP). Surveys were designed to assess wildlife resources in the Project area and assess risk to sensitive species by addressing the issues posed under Tier 3 of the USFWS Final Land-Based Wind Energy Guidelines. The following document contains results for the general fixed-point bird use surveys and incidental wildlife observations. A summary of all data collected is contained in the document, but the overall body of the report focuses on a smaller group of species – diurnal raptors, eagles, state/federally listed species, and South Dakota Sensitive Species (State Species of Concern [SSC] and State Species of Greatest Conservation Need [SGCN]).

The principal objectives of the fixed-point bird use surveys were to: 1) assess the relative abundance and spatial distribution of species in the Project area during all seasons, and 2) identify and assess the potential risk of adverse impacts to species or groups.

Fixed-point bird use surveys were conducted at 16 survey points from March 3, 2016 – April 19, 2017. This was the second year of surveys at the Project, but the survey area between Year One (March 25, 2015 – February 21, 2016) and Year Two changed significantly and thus the point count locations were modified in Year Two. Each survey plot was surveyed for 60 minutes (min). Every bird and/or unique bird species group observed during the first 20 min of each fixed-point bird use survey was recorded using two viewsheds: 800-meter (m; 2,625-feet [ft]) radius plot for large birds and 100-m (328-ft) radius plot for small birds, observations beyond the radius plots were excluded from analysis. Large birds included waterbirds, waterfowl, rails and coots, grebes and loons, gulls and terns, shorebirds, diurnal raptors, owls, vultures, upland game birds, doves/pigeons, large corvids (e.g., ravens, magpies, and crows), and goatsuckers. Passerines (excluding large corvids), kingfishers, swifts/hummingbirds, woodpeckers, and most cuckoos were considered small birds. During the next 40 min of the survey period, only eagles and state/federally listed species were recorded out to the 800-m radius.

A total of 205 fixed-point bird use surveys were conducted during 13 visits. During all surveys and incidental observations, no federally listed species were recorded but one state-listed species (peregrine falcon) was recorded. Thirteen bird species (great blue heron, bald eagle, Cooper's hawk, ferruginous hawk, sharp-shinned hawk, Swainson's hawk, American pelican, white-faced ibis, bufflehead, common merganser, golden eagle, merlin, and peregrine falcon]) listed as South Dakota SGCN and/or SSC were observed during fixed-point surveys and incidentally.

Diurnal raptor use at the Project during Year Two (0.33 raptors/800-m plot/20-min survey) was low compared to other US wind facilities and comparable to other wind energy facilities in the

Midwest with publicly available data and similar to Year One at the Project (0.31 raptors/800-m plot/20-min survey). Fatality monitoring data collected at wind projects in the Midwest suggest that some collision risk exists for individual raptors, but the level of impact is not likely to cause significant adverse impacts to overall species populations.

Significant adverse impacts to overall bird populations are not anticipated at the Project based on data collected at the site, review of available literature, and results of post-construction fatality monitoring at other wind energy facilities. Further post-construction survey effort should be determined in consultation with appropriate agencies to confirm the anticipated impacts.

STUDY PARTICIPANTS

Western EcoSystems Technology

Clayton Derby	Project Manager
Carmen Boyd	Data Manager
Wendy Bruso	Technical Editing Manager
Katie Wynne	Technical Editing Coordinator
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REPORT REFERENCE

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INTRODUCTION

In 2015, Prevailing Winds LLC originally contracted Western EcoSystems Technology, Inc. (WEST) to conduct field surveys in accordance with agency recommendations to quantify wildlife resources within the Prevailing Winds Wind Project (Project) in South Dakota. Year-round surveys were conducted by WEST in 2015 – 2016 within an initial assessment area of approximately 18,139.5 hectares (ha; 44,823.7 acres [ac]). A second year of biological surveys was conducted by WEST to address the issues posed under Tier 3, following guidance in the United States (US) Fish and Wildlife Service (FWS) *Final Land-Based Wind Energy Guidelines* (Guidelines; USFWS 2012) and *Eagle Conservation Plan Guidance* (Guidance; USFWS 2013), within a revised Project area being considered in 2016 (Figure 1). This report includes a summary for the Year Two survey efforts.

Fixed-point bird use surveys were conducted to achieve these principal objectives: 1) assess the relative abundance and spatial distribution of species in the Project area during an entire year, with emphasis on eagles, non-eagle raptors, and state/federally listed species, and 2) identify and assess the potential risk of adverse impacts to sensitive species or groups.

The following document contains results for the general fixed-point bird use surveys and incidental wildlife observations for the study period 2016 – 2017 (Year Two), with focus on eagles, non-eagle diurnal raptors, state/federally listed species, and State non-listed special-status species (i.e., State Species of Greatest Conservation Need [SGCN] and State Species of Concern [SSC]). A summary of the data collected during the 2015 – 2016 study period (Year One) is also included in this report.

STUDY AREA

The revised Project area used for surveys conducted in 2016 – 2017 encompassed approximately 14,981.40 ha (37,019.85 ac) in Bon Homme and Charles Mix counties, north of the town of Avon in southeastern South Dakota (Figure 1). The Project, located in a higher elevated area within the greater landscape, is characterized by a generally flat topography, with elevation ranging from 454.46 meters (m; 1,491.01 feet [ft]) – 573.72 m (1,882.28 ft; US Geological Survey [USGS] Digital Elevation Model 2017). The Project area, historically dominated by grasslands, has extensively been converted to agricultural use, with crop production and livestock grazing the primary practices (Bryce et al. 1998). Approximately half (47.5) % of the proposed Project area is cultivated crops followed by pasture/hay land (37.5%); grassland/herbaceous cover represent 6.7% of the Project area while all other land cover/land use types compose 4% or less of the Project area each (USGS National Land Cover Database 2011). As evidenced during the site visit conducted by WEST in 2015 of the general area, trees and woodlands are found mainly in planted shelter belts and within draws and on hillslopes; wetlands are scattered throughout the Project area (Figure 2), with the USFWS National Wetland Inventory (NWI) indicating approximately 528.08 ha (1,304.91 ac) of wetlands (USFWS NWI 2015).

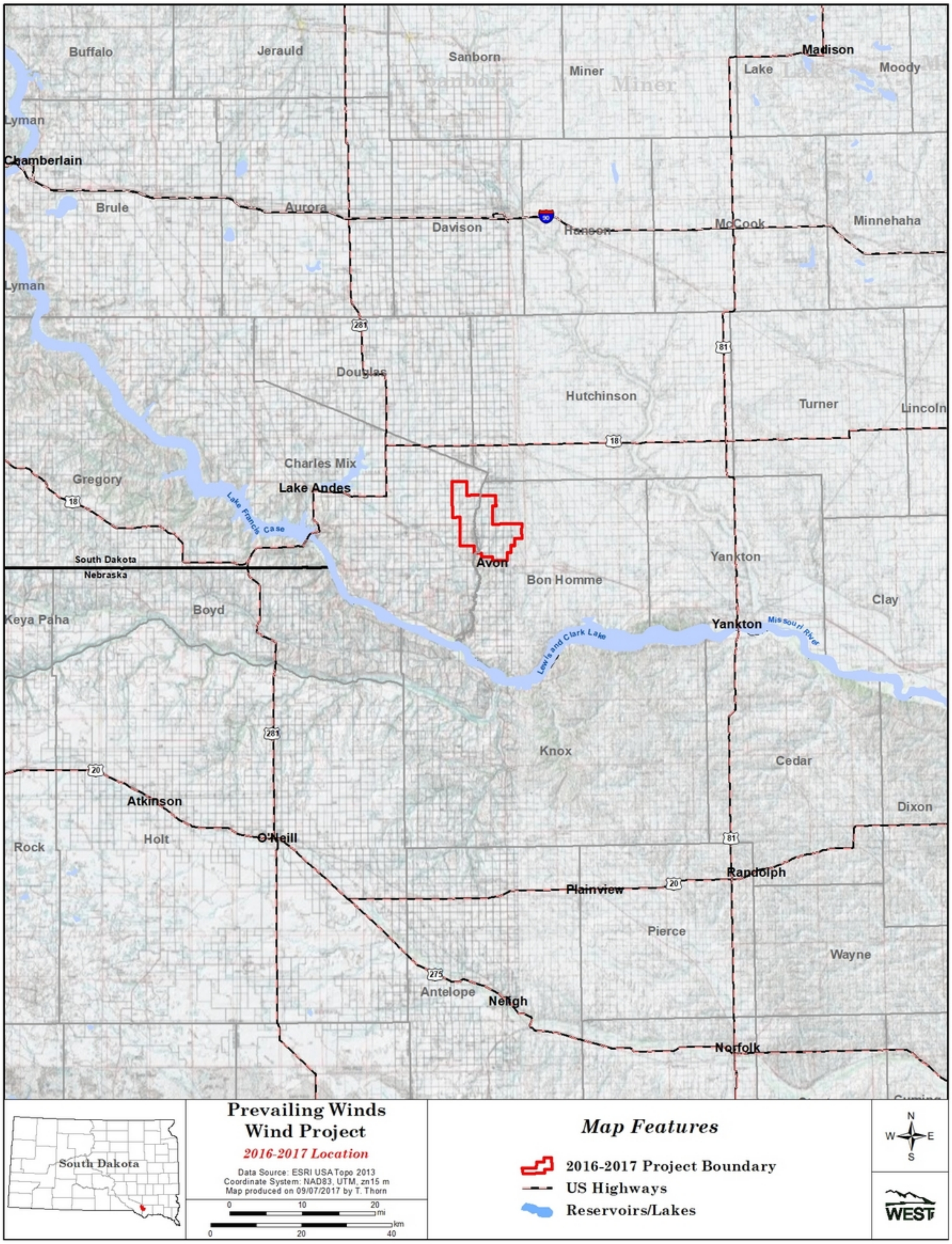

Figure 1. Location of the revised Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, for surveys conducted in 2016 – 2017.

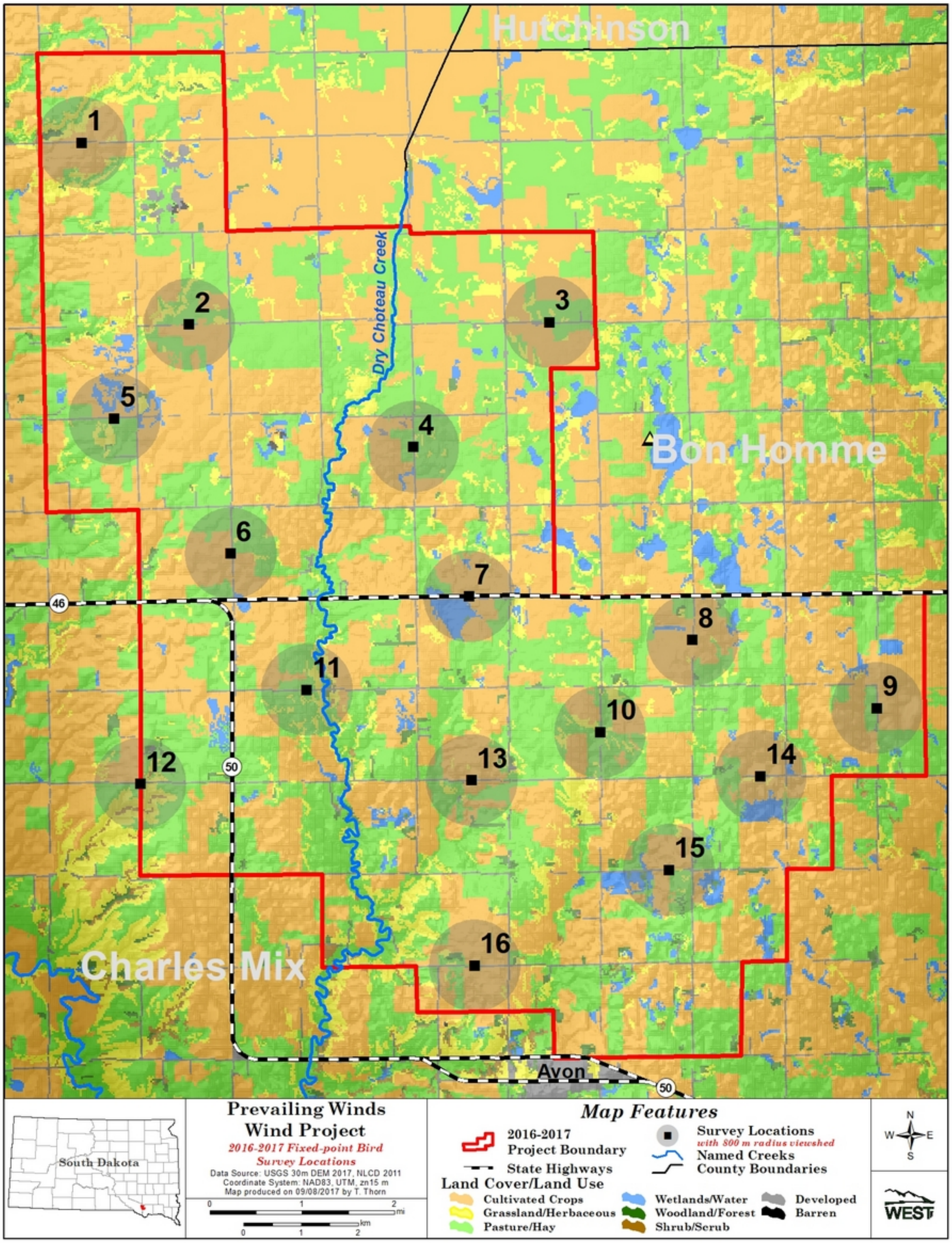

Figure 2. Land cover/Land use and location of the fixed-point plots selected for the Year Two bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017 (USFWS NLCD 2011, Homer et al. 2015).

METHODS

Fixed-Point Bird Use Surveys

Fixed-point bird use surveys (variable circular plots) were conducted using methods described by Reynolds et al. (1980), to estimate the seasonal and spatial use of the study area by birds, particularly diurnal raptors (defined here as kites, accipiters, buteos, harriers, eagles, falcons, and osprey [*Pandion haliaetus*]). Methodologies employed during avian use surveys conducted at the Project are generally comparable to those used at past wind energy facilities in South Dakota.

Survey Plots

Sixteen points were selected to survey representative habitats and topography of the Project, while achieving relatively even coverage of the study area (Figure 2). Each survey plot was an 800-m (2,625-ft) radius circle centered on the point; for analysis purposes, only birds within the 800-m radius were considered for analysis to allow comparison to other projects that used similar analyses.

Survey Methods

Each survey plot was surveyed for 60 minutes (min). Every bird and/or unique bird species group observed during the first 20 min of each fixed-point bird use survey was recorded by a unique observation number. During the next 40 min of the survey period, only eagles and state/federally listed species and state species of concern were recorded out to the 800-m radius. In some cases, the tally of observations may represent repeated sightings of the same individual. Observations of large birds beyond the 800-m radius were recorded but were not included in statistical analyses. For small birds, observations beyond the 100-m (328-ft) radius were excluded. Large birds included waterbirds, waterfowl, rails and coots, grebes and loons, gulls and terns, shorebirds, diurnal raptors, owls, vultures, upland game birds, doves/pigeons, large corvids (e.g., ravens, magpies, and crows), and goatsuckers. Passerines (excluding large corvids), kingfishers, swifts/hummingbirds, woodpeckers, and most cuckoos were considered small birds.

The date, start and end time of the survey period, and weather information (e.g., temperature, wind speed and direction, and cloud cover) were recorded for each survey. Species or best possible identification, number of individuals, sex and age class (if possible), distance from plot center when first observed, closest distance, altitude above ground, activity (behavior), and habitat(s) were recorded for each observation. Bird behavior and habitat type were recorded based on the point of first observation. Approximate flight height and distance from plot center at first observation were recorded to the nearest 5-m (16-ft) interval. Other information collected included whether the observation was auditory only and the 10-min interval of the survey in which the detection first occurred. Locations and flight paths, if applicable, of large birds were recorded during fixed-point bird use surveys on field maps by unique observation number. Data on eagle flight paths and habitat use (i.e., distance from observer, activity, and flight height) were recorded on a per min basis; comments were made when appropriate. Incidental wildlife observations were recorded while conducting all surveys, moving between fixed-point locations, and traveling within the Project. All raptors, listed species, and State sensitive bird species were documented.

Observation Schedule

Survey intensity (i.e., number of fixed-point circular plots and frequency of monitoring) was designed to document year-round use and behavior of birds in the Project area. Fixed-point bird use surveys were conducted approximately monthly for the year. The schedule was generally conducting even numbered points on one visit and then odd numbered points two week later. Surveys were carried out during daylight hours and survey periods varied to approximately cover all daylight hours during a season. To the extent practicable, each point was surveyed roughly the same number of times.

Statistical Analysis

For analysis purposes, a visit was defined as the required length of time, in days, to survey all of the plots once within the Project area. Under certain circumstances, such as extreme weather conditions, all plots may not have been surveyed during a visit. In these cases, a visit might not have constituted a survey of all plots.

Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) measures were implemented at all stages of the study, including in the field, during data entry and analysis, and report writing. Following field surveys, observers were responsible for inspecting data forms for completeness, accuracy, and legibility. Potentially erroneous data were identified using a series of database queries. Irregular codes or data suspected as questionable were discussed with the observer and/or project manager. Errors, omissions, and/or problems identified in later stages of analysis were traced back to the raw data forms, and appropriate changes in all steps were made.

Data Compilation and Storage

A Microsoft® MSSQL database was developed to store, organize, and retrieve survey data. Data were keyed into the electronic database using a pre-defined protocol to facilitate subsequent QA/QC and data analysis. All data forms and electronic data files were retained for reference.

Fixed-Point Bird Use Surveys

<u>Bird Diversity and Species Richness</u>

Bird diversity was illustrated by the total number of unique species observed. Species lists and counts, with the number of observations and the number of groups, were generated by season and included all observations of birds detected, regardless of their distance from the observer. In some cases, the tally of observations may represent repeated sightings of the same individual. Species richness was calculated for each season by first averaging the total number of species observed within each plot during a visit, then averaging across plots within each visit, followed by averaging across visits within each season. Overall species richness was calculated as a weighted average of seasonal values by the number of days in each season.

<u>Mean Use, Percent of Use, and Frequency of Occurrence</u>

Large birds detected within the 800-m radius plot and small birds recorded within the 100-m radius plot were used to calculate mean use and frequency of occurrence. The metric used for mean bird use was number of birds per plot (100-m radius plot for small birds, 800-m radius plot for large birds) per 20-min survey. Seasonal mean use was calculated by first averaging the total number of birds seen within each plot during a visit, then averaging across plots within each visit, followed by averaging across visits within each season. Overall mean use was calculated as a weighted average of seasonal values by the number of days in each season. Percent of use was calculated as the proportion of large or small bird use that was attributable to a particular bird type or species, and frequency of occurrence was calculated as the percent of surveys in which a particular bird type or species was observed. Frequency of occurrence, calculated as the percent of surveys in which a particular bird type or species was observed, provides a relative measure of species exposure to the proposed Project.

<u>Bird Flight Height and Behavior</u>

Bird flight heights are important metrics to assess potential exposure. Flight height information was used to calculate the percentage of birds observed flying within the rotor-swept heights (RSH; estimated to be between 25 – 200 m [82 –656 ft] above ground level). The flight height recorded when the bird was first observed was used to calculate the percentage of birds flying within the RSH and mean flight height. The percentage of birds flying within the RSH at any time (e.g., first 20-min for all birds, entire 60-min for eagles) was calculated using the lowest and highest flight heights recorded. Auditory only observations were excluded from flight height calculations.

<u>Spatial Use</u>

Spatial use of the Project area was evaluated using mean use by survey point. For each species and bird group, the number of individuals observed at each point during the 20-min survey was divided by the total number of surveys at that point.

RESULTS

Surveys were completed within the Project area from May 3, 2016 – April 19, 2017. Summary statistics for the full suite of species observed in the Project area are presented in Appendix A. Results related to eagles, non-eagle raptors, federally/state-listed species (Endangered Species Act [ESA] 1973, South Dakota Game, Fish and Parks [SDGFP] 2016, USFWS 2017), and State sensitive species (SGCN [SDGFP 2014] and SSC [SDGFP 2017]), are more thoroughly covered in the body of this report.

Fixed-Point Bird Use Surveys

Bird Diversity and Species Richness

A total of 205 fixed-point bird use surveys were conducted during 13 visits to the Project area during Year Two surveys: 47 surveys in spring, 63 in summer, 47 in fall, and 48 in winter (Table 1). Ninety unique bird species were observed during the entire duration (60 min) of the fixed-point bird use surveys (Table 1). Bird diversity (the number of unique species observed for entire 60-min survey) was highest during the summer (60 species), followed by spring and fall (46 and 43, respectively), and was lowest in winter (18). Overall species richness (mean number of species/plot/20-min survey) was higher for small birds (2.64) compared to large birds (1.49), being lowest in the winter compared to all other seasons, for both large and small birds (0.38 and 0.94 species/plot/20-min survey, respectively).

Table 1. Number of visits, surveys, bird diversity (number of unique species for entire 60-minute [min] survey), and bird species richness (species/plot[a]/20-min survey) by season and overall, observed during the Year Two fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Season	Number of Visits	Number of Surveys Conducted	Bird Diversity	Bird Species Richness	
				Large Birds	Small Birds
Spring	3	47	46	2.86	2.50
Summer	4	63	60	1.48	4.43
Fall	3	47	43	1.48	2.32
Winter	3	48	18	0.38	0.94
Overall	**13**	**205**	**90**	**1.49**	**2.64**

a. 800-meter (m; 2,625-foot [ft]) radius plot for large birds; 100-m (328-ft) radius plot for small birds

A total of 9,276 observations in 1,090 separate groups (defined as one or more individuals) were recorded during the first 20 min of the Year Two fixed-point bird use surveys (Appendix A1). Regardless of bird size, two identified species (2.2% of all species) accounted for approximately one-third (29%) of all observations: common grackle (*Quiscalus quiscula*; 1,590 observations in 30 groups) and red-winged blackbird (*Agelaius phoeniceus*; 1,105 observations in 84 groups). All other species each accounted for less than 6% of the total observations.

Waterfowl accounted for the majority (2,095 observations within 79 groups) of large bird observations, with snow goose (*Chen caerulescens*) being the most abundant waterfowl species (499 observations within eight groups). Waterbirds composed 1.5% (140 observations) of the total bird observations, with sandhill cranes (111 observations in five groups) being the most abundant waterbird species recorded during bird use surveys. Passerines accounted for the majority (5,855 observations within 681 groups) of small bird observations, with common grackle accounting for the majority of those observations (Appendix A1).

Sixty-nine diurnal raptor observations within 61 groups were recorded during the first 20 min of the Year Two fixed-point bird use surveys conducted at the Project, representing five unique species (Table 2; Appendix A1). Red-tailed hawk (*Buteo jamaicensis*; 34 observations in 32 groups) and northern harrier (*Circus cyaneus*; 11 observations in 10 groups) were the most commonly observed raptor species, accounting for 49.3% and 15.9% of all raptor observations, respectively. One state-listed (SDGFP 2016) species (peregrine falcon [*Falco peregrinus*]) was recorded during Year Two of 60-min fixed-point bird use surveys conducted at the Project; no federally listed (ESA 1973) species were observed during the study period.

Table 2. Number of groups and individuals of diurnal raptors observed, regardless of distance from observer, during the first 20 minutes of the Year Two fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

		Spring		Summer		Fall		Winter		Total	
Raptor Subtype/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
Diurnal Raptors		**19**	**24**	**11**	**13**	**25**	**26**	**6**	**6**	**61**	**69**
Accipiters		*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*1*	*1*
Cooper's hawk[a]	*Accipiter cooperii*	0	0	1	1	0	0	0	0	1	1
Buteos		*13*	*13*	*10*	*12*	*13*	*13*	*3*	*3*	*39*	*41*
red-tailed hawk	*Buteo jamaicensis*	12	12	9	11	11	11	0	0	32	34
rough-legged hawk	*Buteo lagopus*	0	0	0	0	2	2	3	3	5	5
unidentified buteo	*Buteo spp*	1	1	1	1	0	0	0	0	2	2
Northern Harrier		*3*	*4*	*0*	*0*	*7*	*7*	*0*	*0*	*10*	*11*
northern harrier	*Circus cyaneus*	3	4	0	0	7	7	0	0	10	11
Eagles		*1*	*4*	*0*	*0*	*1*	*1*	*2*	*2*	*4*	*7*
bald eagle[a,b]	*Haliaeetus leucocephalus*	1	4	0	0	1	1	2	2	4	7
Other Raptors		*2*	*3*	*0*	*0*	*4*	*5*	*1*	*1*	*7*	*9*
unidentified raptor		2	3	0	0	4	5	1	1	7	9
Overall Diurnal Raptors		**19**	**24**	**11**	**13**	**25**	**26**	**6**	**6**	**61**	**69**

Grps = Number of groups, # Obs = Number of observations

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

[b.] State Species of Greatest Conservation Need (SDGFP 2014)

Mean Use, Percent of Use, and Frequency of Occurrence

Mean bird use, percent of use, and frequency of occurrence by season for all bird types and species observed during the first 20 min of surveys are shown in Appendix A2; Table 3 shows a summary of mean use and frequency of occurrence by major bird type and species of concern. The highest overall large bird use occurred during spring (36.38 birds/800-m plot/20-min survey), followed by fall (20.11), winter (9.12), and summer (3.65; Appendix A2). Seasonal large bird use was largely driven by waterfowl in the spring and winter, and by shorebirds and waterbirds in the fall and summer, respectively (Appendix A2). Small bird use was lowest in the winter (6.79 birds/100-m plot/20-min survey) compared to any other season, and was largely driven by passerine use across seasons (Appendix A3).

Waterbird use ranged from 0.42 – 1.23 birds/800-m plot/20-min survey in the fall, spring and summer, with no waterbirds being recorded in the winter (Table 3). Of the four waterbird species observed, sandhill cranes (*Antigone canadensis*) were observed only in spring and summer (0.85 and 1.17 birds/800-m plot/20-min survey, respectively) and composed the majority of observations during those seasons; use by great blue heron (*Ardea herodias*), a SSC, was recorded in all seasons but winter, ranging from 0.02 – 0.06 birds/800-m plot/20-min survey (Appendix A2). Waterbirds were observed more frequently during the spring (10.6%) compared to fall (6.4%) and summer (4.8%; Table 3).

Diurnal raptor use was highest in the fall and spring (0.55 and 0.51 raptors/800-m plot/20-min survey, respectively), followed by summer (0.21), and winter (0.12; Table 3). Higher raptor use during the fall and spring was primarily due to use of the Project area by red-tailed hawks (0.23 and 0.25, respectively). Diurnal raptor use in the winter consisted of rough legged hawks (*Buteo lagopus*), bald eagles (*Haliaeetus leucocephalus*; a SGCN), and one unidentified raptor (Table 3, Appendices A1 and A2). Diurnal raptors were observed during 38.2% of fall and 33.9% of spring surveys compared to 15.9% of summer and 8.3% of winter surveys (Table 3).

Use by Cooper's hawk (*Accipiter cooperii*; a SSC) was observed exclusively during the summer (0.02 birds/800-m plot/20-min survey) and use by northern harriers was observed exclusively during fall and spring migration (0.15 and 0.09 birds/800-m plot/20-min survey, respectively). Bald eagles were observed in all seasons but summer during the first 20 min of fixed-point bird use surveys, and were the only eagle species observed during fixed-point bird use surveys conducted at the Project (Appendix A1). Use by bald eagles ranged from 0.02 – 0.08 birds/800-m plot/20-min survey (Appendix A2) and they were observed during 2.1% of spring, fall, and winter surveys (Table 3).

Passerine use was lowest during the winter (6.58 birds/100-m plot/20-min survey), compared to any other season (Table 3), and was largely due to use by horned larks (*Eremophila alperstris*; 5.54 birds/100-m plot/20-min survey; Appendix A3). Red-winged blackbird (*Agelaius phoeniceus*) had the highest use (13.19 birds/100-m plot/20-min survey) of passerine species observed in spring, while common grackle (*Quiscalus quiscula*) had the highest passerine use during the summer and fall (16.14 and 12.00, respectively; Appendix A3). Passerines were observed during 97.9% of spring surveys, 96.9% of summer surveys, 75.0% of fall surveys, and 62.5% of winter surveys (Appendix A3).

Table 3. Seasonal bird mean use and frequency of occurrence for waterbirds, waterfowl, passerines, diurnal raptor species, and sensitive species observed during the first 20 minutes of Year Two fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

	Mean Use[1]				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Waterbirds	**0.96**	**1.23**	**0.42**	**0**	**10.6**	**4.8**	**6.4**	**0**
great blue heron[a]	0.02	0.02	0.06	0	2.1	1.6	6.4	0
Waterfowl	**29.2**	**0.48**	**5.12**	**8.71**	**44.7**	**7.8**	**6.2**	**8.3**
bufflehead	0	0	0.25	0	0	0	2.1	0
Common merganser	0	0	0	0.02	0	0	0	2.1
Diurnal Raptors	**0.51**	**0.21**	**0.55**	**0.12**	**33.9**	**15.9**	**38.2**	**8.3**
Accipiters	*0*	*0.02*	*0*	*0*	*0*	*1.7*	*0*	*0*
Cooper's hawk[a]	0	0.02	0	0	0	1.7	0	0
Buteos	*0.28*	*0.19*	*0.28*	*0.06*	*23.3*	*14.3*	*25.4*	*6.2*
red-tailed hawk	0.25	0.17	0.23	0	21.1	12.7	21.2	0
rough-legged hawk	0	0	0.04	0.06	0	0	4.2	6.2
unidentified buteo	0.02	0.02	0	0	2.2	1.6	0	0
Northern Harrier	*0.09*	*0*	*0.15*	*0*	*6.4*	*0*	*14.9*	*0*
northern harrier	0.09	0	0.15	0	6.4	0	14.9	0
Eagles	*0.08*	*0*	*0.02*	*0.04*	*2.1*	*0*	*2.1*	*2.1*
bald eagle[a,b]	0.08	0	0.02	0.04	2.1	0	2.1	2.1
Other Raptors	*0.06*	*0*	*0.10*	*0.02*	*4.2*	*0*	*8.3*	*2.1*
unidentified raptor	0.06	0	0.10	0.02	4.2	0	8.3	2.1
Passerines	**22.10**	**28.8**	**35.31**	**6.58**	**97.9**	**96.9**	**75.0**	**62.5**

Note: Totals by bird type and overall might not correspond to the sum of individual species due to rounding

1. 800-meter (m; 2,625-foot [ft]) radius plot for large birds; 100-m (328-ft) radius plot for small birds

a. State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

b. State Species of Greatest Conservation Need (SDGFP 2014)

State/Federally Listed Species and Sensitive Species Observations

No federally listed species (ESA 1973) were observed during Year Two of fixed-point bird use surveys conducted in the Project area from May 3, 2016 – April 19, 2017 (Table 4). One peregrine falcon, a state-listed species, was observed during the 60-min fixed-point bird use surveys (Table 4) conducted in the fall of the Year Two surveys. Twelve non-listed special-status species were recorded during fixed-point bird use surveys and incidentally, including 24 bald eagles (a SGCN) within 15 groups, and one golden eagle (*Aquila chrysaetos*; a SSC) observed incidentally in the winter of 2016 (Table 4); both eagle species are further protected under the Bald and Golden Eagle Protection Act (1940). Two additional South Dakota SGCN were recorded during the Year Two survey period: ferruginous hawk (*Buteo regalis*; three observations within three groups), and American white pelican (*Pelecanus erythrorhynchos*; 10 observations within one group). The other eight non-listed special-status species observed were: great blue heron, white-faced ibis (*Plegadis chihi*), bufflehead (*Bucephala albeola*), common merganser (*Mergus merganser*), Cooper's hawk, merlin (*Falco columbarius*), sharp-shinned hawk (*Accipiter striatus*), and Swainson's hawk (*Buteo swainsoni*); see Species Specific Summaries section for a detailed discussion of these species.

Table 4. Sensitive species observed during fixed-point bird use surveys (FP)[a] and Incidentally (Inc.) within the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Species	Scientific Name	Status	FP # Grps	FP # Obs	Inc. # Grps	Inc. # Obs	Total # Grps	Total # Obs
American white pelican	*Pelecanus erythrorhynchos*	SGCN, SSC	1	10	0	0	1	10
great blue heron	*Ardea herodias*	SSC	5	5	0	0	5	5
white-faced ibis	*Plegadis chihi*	SSC	1	1	0	0	1	1
bufflehead	*Bucephala albeola*	SSC	1	12	0	0	1	12
common merganser	*Mergus merganser*	SSC	2	10	0	0	2	10
bald eagle	*Haliaeetus leucocephalus*	SGCN, SSC, BGEPA	12	20	3	4	15	24
golden eagle	*Aquila chrysaetos*	SSC, BGEPA	0	0	1	1	1	1
Cooper's hawk	*Accipiter cooperii*	SSC	1	1	0	0	1	1
ferruginous hawk	*Buteo regalis*	SGCN	3	3	0	0	3	3
merlin	*Falco columbarius*	SSC	1	1	0	0	1	1
peregrine falcon	*Falco peregrinus*	SE, SGCN, SSC	1	1	0	0	1	1
sharp-shinned hawk	*Accipiter striatus*	SSC	2	2	0	0	2	2
Swainson's hawk	*Buteo swainsoni*	SSC	2	2	0	0	2	2

Grps = Number of groups, # Obs = Number of observations

[a.] Within 60-minute (min) survey for large birds and 20-min survey for small birds

BGEPA = Bald and Golden Eagle Protection Act (1940)

SE = State Endangered,

SGCN = State Species of Greatest conservation Need (SDGFP 2014)

SSC = State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

Bird Flight Height and Behavior

Flight height characteristics, based on initial flight height observations and estimated use, were estimated for both bird types and species (Tables 5 and 6). During the 60-min fixed-point bird use surveys, 240 groups of large birds were observed flying within the 800-m radius plot, totaling 2,682 individuals. Although the percentage of large birds observed flying was evenly spread across flight height categories, the majority of waterbirds (78.1%) and shorebirds (84.1%) were recorded flying within the RSH, while approximately half (47.1%) of the waterfowl observations were recorded flying within the RSH for collision with turbine blades of 25 -- 200 m (82 – 656 ft) above ground level (Table 5). Diurnal raptors tended to fly within (53.6%) and below (39.3%) the RSH, with some subtype differences. The majority (61.9%) of flying buteos was recorded within the RSH, while the majority (90.0%) of harriers were recorded flying below the RSH and the majority (71.4%) of eagles were recorded flying within the RSH (Table 5).

During the first 20 min of the fixed-point bird use surveys, 326 groups of small birds were observed flying within the 100-m radius plot, totaling 3,098 individuals, mostly passerines (Table 5). Overall, 91.1% of flying small birds were recorded below the RSH (Table 5).

Table 5. Flight height (meters [m] above ground level), based on initial observation, characteristics by bird types and raptor subtypes observed during Year Two of the fixed-point bird use surveys[a] conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Bird Type/Subtype	# Groups Flying	# Obs Flying	Mean Flight Height (m)	% Obs Flying	% Within Flight Height Categories < 25 m	25 - 200 m[b]	> 200 m
Loons/Grebes	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Waterbirds	**10**	**96**	**83.40**	**63.6**	**11.5**	**78.1**	**10.4**
Waterfowl	**54**	**1,621**	**77.76**	**77.0**	**20.9**	**47.1**	**32**
Shorebirds	**34**	**477**	**12.94**	**90.3**	**15.9**	**84.1**	**0**
Gulls/Terns	**7**	**194**	**25.43**	**100**	**90.2**	**9.8**	**0**
Rails/Coots	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Diurnal Raptors	**72**	**84**	**72.31**	**91.3**	**39.3**	**53.6**	**7.1**
Accipiters	*3*	*3*	*31.33*	*100*	*66.7*	*33.3*	*0*
Buteos	*40*	*42*	*62.83*	*91.3*	*38.1*	*61.9*	*0*
Northern Harrier	*9*	*10*	*14.11*	*90.9*	*90.0*	*10.0*	*0*
Eagles	*13*	*21*	*143.08*	*100*	*4.8*	*71.4*	*23.8*
Falcons	*2*	*2*	*8.50*	*100*	*100*	*0*	*0*
Unidentified Raptors	*5*	*6*	*119.00*	*66.7*	*50.0*	*33.3*	*16.7*
Vultures	**6**	**6**	**50.33**	**66.7**	**66.7**	**33.3**	**0**
Upland Game Birds	**2**	**3**	**1.00**	**4.2**	**100**	**0**	**0**
Doves/Pigeons	**45**	**110**	**6.33**	**72.4**	**99.1**	**0.9**	**0**
Large Corvids	**10**	**91**	**9.20**	**91.0**	**100**	**0**	**0**
Goatsuckers	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Large Birds Overall	**240**	**2,682**	**48.08**	**78.7**	**31.3**	**48.7**	**19.9**
Passerines	**320**	**3,092**	**7.64**	**64.4**	**91.1**	**8.9**	**0**
Woodpeckers	**5**	**5**	**3.80**	**38.5**	**100**	**0**	**0**
Kingfishers	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Unidentified Birds	**1**	**1**	**10.00**	**3.2**	**100**	**0**	**0**
Small Birds Overall[c]	**326**	**3,098**	**7.59**	**63.9**	**91.1**	**8.9**	**0**

Obs = Observations

a. 800-meter (m; 2,625-foot [ft]) radius plot and 60 min survey for large birds; 100-m (328-ft) radius plot and 20 min survey for small birds

b. The likely rotor-swept height for potential collision with a turbine blade, or 25 – 200 m (82 – 656 ft) above ground level

c. Excluding large corvids

One-hundred percent of Swainson's hawks and common merganser groups were observed flying within RSH based on initial observation (Table 6) while half (50.0%) of sharp-shinned hawk groups were observed flying within RSH; 75.0% of bald eagle and 33.3% of ferruginous hawk groups were also observed flying within RSH. No other special-status species were observed flying within the RSH at any time (Table 6).

Table 6. Flight characteristics for non-listed special-status species observed[a] during Year Two of the fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Species	# Groups Flying	Overall Mean Use	% Flying	% Flying within RSH[b] Based on Initial Observation	% Within RSH at Any time
American white pelican	1	0.04	100	0	0
great blue heron	3	0.02	60.0	0	0
white-faced ibis	1	<0.01	100	0	0
bufflehead	0	0.06	0	0	0
common merganser	1	0.05	10	100	100
bald eagle[c]	12	0.09	100	75.0[c]	95.0
Cooper's hawk	1	<0.01	100	0	0
ferruginous hawk	3	0.01	100	33.3	33.3
merlin	1	<0.01	100	0	0
peregrine falcon	1	<0.01	100	0	0
sharp-shinned hawk	2	<0.01	100	50.0	50.0
Swainson's hawk	2	<0.01	100	100	100

a. 800-meter (m; 2,625-foot [ft]) radius plot and 60 min survey for large birds; 100-m (328-ft) radius plot and 20 min survey for small birds

b. The likely rotor-swept height (RSH) for potential collision with a turbine blade, or 25 – 200 m (82-656 ft) above ground level

c. Does not include the one unidentified eagle observed during fixed-point bird use surveys.

Spatial Use

For all large bird species combined, use (focused within 800 m) was highest at Point 9 (47.15 birds/20-min survey) largely due to high waterfowl use at this point (32.08 birds/20-min survey). Waterfowl were observed at all but two points, with use ranging from 0.08 – 32.42 birds/20-min survey (Table 7). Large bird use at other points ranged from 2.62 – 39.17 birds/20-min survey. Waterbird use was observed at seven of the 16 points, ranging from 0.08 (at Point 6) – 5.46 (at Point 9) birds/20-min survey and shorebird use was recorded at all points, ranging from 0.15 – 23.54 birds/20-min survey. Diurnal raptors were observed at all points but one, with use largely driven by buteos and harriers (Table 7). Diurnal raptor use was highest at Point 9 (0.62 birds/20-min survey), and ranged from 0.08 – 0.54 birds/20-min survey at other points. Eagle use (for the observations included in analysis) occurred at Points 4, 9, and 13 (0.08, 0.31, and 0.15 birds/20-min survey, respectively), while accipiters were only observed at Point 8 (0.08 birds/20-min). Small bird use (focused within 100 m), was highest at Point 8 (101.67 birds/20-min survey), and ranged from 4.08 – 84.15 birds/20-min surveys at all other points; small bird use at all points was mostly due to use by passerines (Table 7).

Eagle Use and Flight Paths

Overall, there were 205 hours (12,300 min) of eagle fixed-point use surveys (60-min surveys) conducted at the Project (Table 8) during Year Two. During this time, 20 bald eagles were visible for 135 min and one unidentified eagle for eight min. The majority of total eagle minutes as well as eagle risk minutes were accounted for during one 60-min survey on March 5, 2017 along the eastern edge of the Project at Point 9. During the survey one group of four and one group of five bald eagles were observed for a total of 72 total eagle minutes and 43 eagle risk minutes. The unidentified eagle was recorded at Point 12 after the initial 20-min survey period. Thirteen of the 20 bald eagle observations were observed after the initial 20-min survey period, including the individuals recorded at Points 7 and 15. Flight paths for bald eagles at the Project showed no apparent pattern (Figure 3).

Table 7. Mean use recorded at each survey point during the first 20 minutes of Year Two fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

	Mean Use (number of birds/20-minute survey)[a] by Survey Point															
Bird Type	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Loons/Grebes	**0**	**0**	**0**	**0**	**0**	**0**	**0.38**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Waterbirds	**0**	**0**	**0**	**0**	**0.46**	**0.08**	**1.85**	**0**	**5.46**	**0.23**	**2.31**	**0**	**0.38**	**0**	**0**	**0**
Waterfowl	**17.85**	**16.67**	**3.46**	**5.62**	**4.62**	**0.92**	**12.31**	**32.42**	**32.08**	**15.46**	**0**	**7.69**	**0**	**1.23**	**15.75**	**0.08**
Shorebirds	**0.31**	**0.17**	**23.54**	**0.54**	**0.92**	**1.46**	**0.62**	**0.58**	**8.54**	**0.23**	**0.15**	**0.23**	**1.92**	**0.31**	**0.50**	**0.69**
Gulls/Terns	**0.77**	**3.33**	**0**	**0**	**2.54**	**0**	**7.85**	**0**	**0**	**0.69**	**0**	**0**	**0**	**0**	**0**	**0**
Rails/Coots	**0**	**0**	**0.08**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Diurnal Raptors	**0.46**	**0.42**	**0.08**	**0.54**	**0.23**	**0.23**	**0.23**	**0.17**	**0.62**	**0.46**	**0.46**	**0.54**	**0.54**	**0.15**	**0**	**0.23**
Accipiters	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0.08*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Buteos	*0.31*	*0.25*	*0*	*0.38*	*0.08*	*0.15*	*0.15*	*0.08*	*0.08*	*0.31*	*0.38*	*0.46*	*0.31*	*0.15*	*0*	*0.08*
Northern Harrier	*0.08*	*0.17*	*0*	*0.08*	*0.15*	*0.08*	*0.08*	*0*	*0.08*	*0.08*	*0.08*	*0*	*0*	*0*	*0*	*0*
Eagles	*0*	*0*	*0*	*0.08*	*0*	*0*	*0*	*0*	*0.31*	*0*	*0*	*0*	*0.15*	*0*	*0*	*0*
Unidentified Raptors	*0.08*	*0*	*0.08*	*0*	*0*	*0*	*0*	*0*	*0.15*	*0.08*	*0*	*0.08*	*0.08*	*0*	*0*	*0.15*
Vultures	**0**	**0.08**	**0**	**0.15**	**0.08**	**0**	**0**	**0**	**0**	**0**	**0**	**0.23**	**0**	**0.08**	**0.08**	**0**
Upland Game Birds	**0.92**	**0.25**	**0.15**	**0.23**	**0.23**	**0.31**	**0.23**	**0.17**	**0.23**	**0.15**	**0.15**	**0.31**	**0.15**	**0.31**	**0.33**	**1.38**
Doves/Pigeons	**0.23**	**0.50**	**0.08**	**0.46**	**0.08**	**0.08**	**0.46**	**0.83**	**0.23**	**1.31**	**4**	**0.46**	**2.08**	**0.54**	**0.25**	**0.23**
Large Corvids	**0**	**0**	**0**	**0.15**	**0.15**	**0**	**0.08**	**5.00**	**0**	**0.08**	**0.08**	**0.38**	**0**	**0**	**2.17**	**0.15**
Goatsuckers	**0.08**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Overall large birds	**20.62**	**21.42**	**27.38**	**7.69**	**9.31**	**3.08**	**24.00**	**39.17**	**47.15**	**18.62**	**7.15**	**9.85**	**5.08**	**2.62**	**19.08**	**2.77**
Passerines	**8.77**	**18.50**	**6.08**	**7.00**	**10.62**	**12.85**	**18.77**	**101.42**	**10**	**37.62**	**23.92**	**11.00**	**4.00**	**15.15**	**9.83**	**83.92**
Woodpeckers	**0**	**0**	**0**	**0.08**	**0**	**0**	**0.08**	**0.17**	**0.08**	**0.08**	**0**	**0.23**	**0.08**	**0.15**	**0.08**	**0**
Kingfishers	**0**	**0**	**0**	**0**	**0**	**0**	**0.08**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Unidentified Birds	**0.23**	**0.17**	**0**	**0.15**	**0.15**	**0.23**	**0.15**	**0.08**	**0.15**	**0**	**0**	**0**	**0**	**0.08**	**0.83**	**0.23**
Overall small birds	**9.00**	**18.67**	**6.08**	**7.23**	**10.77**	**13.08**	**19.08**	**101.67**	**10.23**	**37.69**	**23.92**	**11.23**	**4.08**	**15.38**	**10.75**	**84.15**

800-m (m; 2,625-foot [ft]) radius plot for large birds; 100-m (328-ft) radius plot for small birds

Table 8. Survey effort, number of eagle observations and groups, total eagle minutes (min), risk minutes, and eagle use by season, observed during Year Two of the 60-min bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Season	Survey Effort (hours)	Number of Eagle Observations	Number of Groups	Total Eagle Minutes	Risk Minutes[a]	Eagle Use[b]
Bald Eagle						
Spring	47	14	6	75	45	0.29
Summer	63	2	2	25	6	0.03
Fall	47	1	1	8	5	0.02
Winter	48	3	3	27	14	0.06
Overall Bald Eagle	**205**	**20**	**12**	**135**	**70**	
Unidentified Eagle						
Spring	47	0	0	0	0	0
Summer	63	0	0	0	0	0
Fall	47	1	1	8	8	0.02
Winter	48	0	0	0	0	0
Overall Unidentified Eagle	**205**	**1**	**1**	**8**	**8**	**0**

[a.] Where eagles flew below 200 meters (m) above ground level and within 800 m of the observer

[b.] Eagles/800-m plot/60 minutes

Available upon request.

Incidental Observations

Thirty-six unique bird species and 10 unidentified species were observed incidentally at the Project, totaling 4,029 birds within 379 separate groups (Table 9). Sandhill crane (763 birds within seven groups) and Canada goose (*Branta canadensis*; 400 birds within 19 groups) were the most abundant incidental species observed at the Project (Table 9). Six unique and four unidentified diurnal raptor species were recorded incidentally during the Year Two survey period, totaling 177 individuals within 164 groups. Red-tailed hawk was the most abundant (114 birds within 104 groups) diurnal raptor recorded incidentally; American kestrel (*Falco sparverius*) and golden eagle were only observed incidentally, with three and one observations, respectively (Table 9).

Table 9. Incidental wildlife observed while conducting all surveys at the at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Species	Scientific Name	# Groups	# Individuals
double-crested cormorant	*Phalacrocorax auritus*	2	2
sandhill crane	*Antigone canadensis*	7	763
blue-winged teal	*Anas discors*	3	13
cackling goose	*Branta hutchinsii*	14	289
Canada goose	*Branta canadensis*	19	400
Canvasback[a]	*Aythya valisineria*	2	33
greater white-fronted goose	*Anser albifrons*	5	87
Mallard	*Anas platyrhynchos*	8	30
northern pintail	*Anas acuta*	1	5
northern shoveler	*Anas clypeata*	1	1
redhead[a]	*Aythya americana*	1	50
ring-necked duck	*Aythya collaris*	1	20
Ross' goose[a]	*Chen rossii*	6	88
ruddy duck	*Oxyura jamaicensis*	2	12
snow goose	*Chen caerulescens*	6	332
unidentified duck		6	25
unidentified goose		3	1,196
unidentified waterfowl		4	54
Killdeer	*Charadrius vociferus*	26	40
upland sandpiper	*Bartramia longicauda*	7	7
Bonaparte's gull[a]	*Chroicocephalus philadelphia*	2	26
Franklin's gull	*Leucophaeus pipixcan*	2	60
ring-billed gull	*Larus delawarensis*	8	60
unidentified gull		2	22
American kestrel[a]	*Falco sparverius*	3	3
bald eagle	*Haliaeetus leucocephalus*	3	4
golden eagle[a]	*Aquila chrysaetos*	1	1
northern harrier	*Circus cyaneus*	17	18
rough-legged hawk	*Buteo lagopus*	9	9
red-tailed hawk	*Buteo jamaicensis*	104	114
unidentified accipiter	*Accipiter spp*	4	4
unidentified buteo	*Buteo spp*	6	7
unidentified eagle		2	2
unidentified raptor		15	15
turkey vulture	*Cathartes aura*	15	24
ring-necked pheasant	*Phasianus colchicus*	24	31

Table 9. Incidental wildlife observed while conducting all surveys at the at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

Species	Scientific Name	# Groups	# Individuals
wild turkey	*Meleagris gallopavo*	2	12
Eurasian collared-dove	*Streptopelia decaocto*	2	2
rock pigeon	*Columba livia*	5	16
American crow	*Corvus brachyrhynchos*	22	94
American robin	*Turdus migratorius*	1	2
blue jay	*Cyanocitta cristata*	2	3
northern shrike	*Lanius excubitor*	1	1
unidentified blackbird		1	50
northern flicker	*Colaptes auratus*	1	1
unidentified large bird		1	1
Total		**379**	**4,029**

[a.] Species that were only 0bserved incidentally.

DISCUSSION

The Guidelines use a tiered approach to assess impacts to species and their habitats, and avian use surveys are one of a suite of Tier 3 studies used to inform risk at the Project. Tier 3 studies were targeted to address questions regarding impact that could not be sufficiently addressed using available literature (i.e., Tiers 1 and 2 desktop analyses). These studies provide additional data that, when combined with available literature reviewed in previous Tiers, allow for a confident assessment of the risk of significant population-level adverse impacts to sensitive species; identify measures to mitigate significant adverse impacts, if necessary; and/or identify a need for more field studies, if the current survey effort did not provide sufficient data to adequately characterize the potential for significant adverse impacts to such species. While the avian use surveys reported herein were conducted across all species observed, the report focuses on a smaller group of species – diurnal raptors, eagles, listed species, and State sensitive species.

The impact of wind energy development on birds can be direct or indirect. Direct impacts include fatalities or injury associated with facility infrastructure and the loss of habitat where infrastructure is placed. Indirect impacts include the displacement of wildlife and rendering habitat unsuitable through fragmentation of the landscape.

The focus of this study was mainly to document large bird use with an emphasis on eagles and diurnal raptors. The majority (86%) of all bird observations during this study were waterfowl or passerine species. The most common waterfowl species were snow and greater-white fronted geese, while the most common passerine species were common grackle and red-winged blackbird. Waterbirds composed a small percentage of the total bird observations, with sandhill cranes being the most abundant waterbird species recorded during bird use surveys. Relatively few (69 observations) diurnal raptors were observed during standardized surveys and 177 were recorded incidentally. The most common diurnal raptor species was red-tailed hawk, documented both incidentally and during scheduled surveys; golden eagles were documented only incidentally within the Project area, while bald eagles were documented both incidentally and during fixed-point bird use surveys. One State-listed species (the State-endangered peregrine falcon) was documented during the Year Two survey period; no federally listed species were documented within the Project area during the survey period. Diurnal raptors and State sensitive species are discussed in more detail below;

Diurnal Raptors

Annual mean diurnal raptor use at the Project was 0.33 raptors/800-m plot/20-min survey, with highest use in the fall and spring, likely from an influx of migrating raptors. Mean raptor use was compared with other wind energy facilities that implemented similar protocols and had data covering similar seasons, ranking 33rd from the highest compared to the 47 other wind energy facilities in North America (Figure 4).

Publicly available data containing both mean raptor use and raptor fatality information in the Midwest is scarce, while data having this information for four seasons is even rarer (Table 10). The Beethoven Project, immediately adjacent to the Project, had a mean raptor use of 0.103 raptors/800-m plot/20-min survey (Derby and Thorn 2014) and a raptor fatality rate of 0.07 fatalities/MW/year (WEST 2016; Table 10). The Wessington Springs Project, approximately 80 miles north of the project, in South Dakota had a mean raptor use of 0.23 raptors/800-m plot/20-min survey and raptor fatality rates of 0.06 and 0.07 fatalities/MW/year during two separate years of fatality monitoring (Derby et al. 2010f, 2011d). Raptor fatality rates reported at other South Dakota wind energy facilities have ranged from 0 – 0.20 fatalities/MW/year (Table 10). Raptor fatality rates throughout the Midwest have ranged from zero at numerous facilities to 0.47 fatalities/MW/year at Buffalo Ridge, Phase I (Johnson et al. 2000a).

In the Midwest states, 55 diurnal raptor fatalities representing seven species have been documented at wind energy facilities in publicly available fatality studies. Red-tailed hawks represented most of the fatalities (38 fatalities; 69.1% of raptor fatalities), followed by American kestrel (five fatalities; 9.1% of raptor fatalities), sharp-shinned hawk (four fatalities; 7.3% of raptor fatalities), rough-legged hawk (three fatalities; 5.5% of raptor fatalities), and Cooper's hawk (two fatalities; 3.6% of raptor fatalities). Each of the remaining species (merlin, Swainson's hawk, and unidentified raptor) accounted for one fatality each. These are unadjusted, raw data. Cumulative fatalities and species are from data compiled by WEST from publicly available fatality studies (a list of facilities and references are available from WEST). Based on the currently available data, raptor fatality rates in the Project will likely be similar to other wind energy facilities in the Midwest that also have low raptor use and are likely to consist of the relatively common and widespread species documented in this survey.

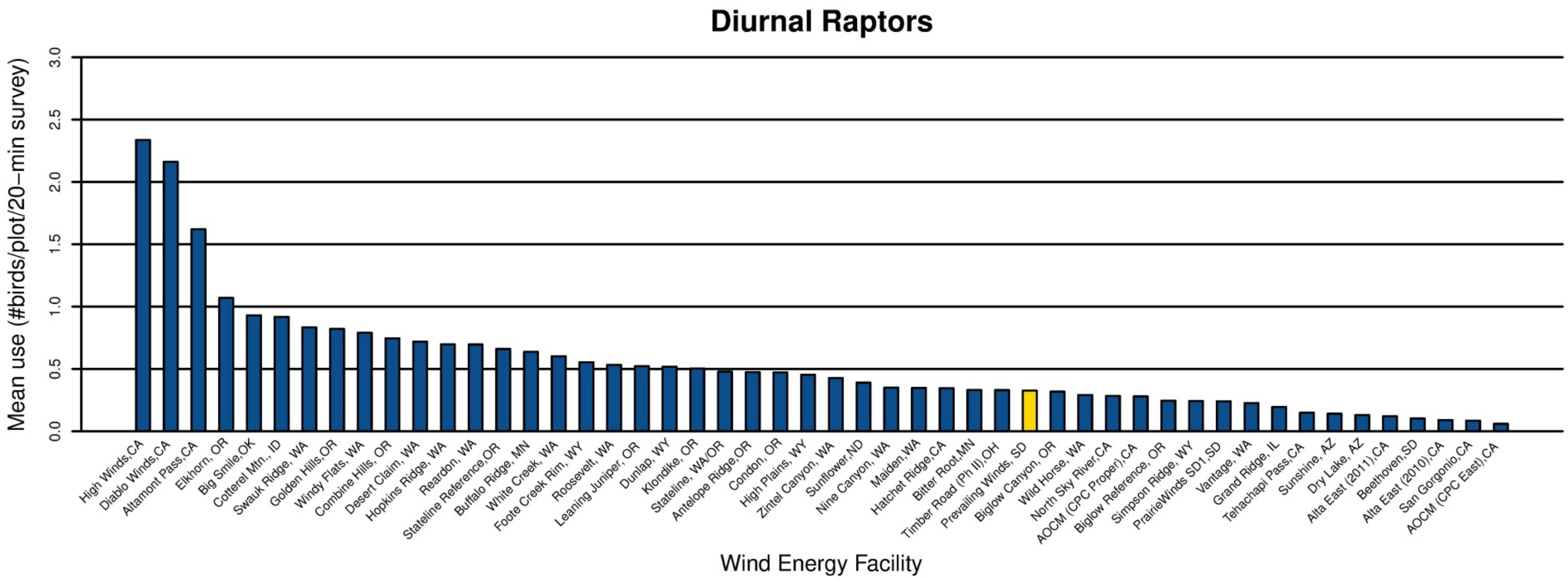

Figure 4. Comparison of estimated annual diurnal raptor use during the Year Two of the fixed-point bird use surveys conducted at the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017, and diurnal raptor use at other US wind resource areas with comparable raptor use data.

Data from the following sources:

Study and Location	Reference	Study and Location	Reference	Study and Location	Reference
Prevailing Winds, SD	This study.				
High Winds, CA	Kerlinger et al. 2005	Foote Creek Rim, WY	Johnson et al. 2000b	Wild Horse, WA	Erickson et al. 2003d
Diablo Winds, CA	WEST 2006	Roosevelt, WA	NWC and WEST 2004	North Sky River, CA	Erickson et al. 2011
Altamont Pass, CA	Orloff and Flannery 1992	Leaning Juniper, OR	Kronner et al. 2005	AOCM (CPC Proper), CA	Chatfield et al. 2010
Elkhorn, OR	WEST 2005a	Dunlap, WY	Johnson et al. 2009a	Biglow Reference, OR	WEST 2005c
Big Smile (Dempsey), OK	Derby et al. 2010a	Klondike, OR	Johnson et al. 2002	Simpson Ridge, WY	Johnson et al. 2000b
Cotterel Mtn., ID	BLM 2006	Stateline, WA/OR	Erickson et al. 2003a	Vantage, WA	Jeffrey et al. 2007
Swauk Ridge, WA	Erickson et al. 2003b	Antelope Ridge, OR	WEST 2009	Grand Ridge, IL	Derby et al. 2009
Golden Hills, OR	Jeffrey et al. 2008	Condon, OR	Erickson et al. 2002b	Tehachapi Pass, CA	Anderson et al. 2000, Erickson et al. 2002b
Windy Flats, WA	Johnson et al. 2007	High Plains, WY	Johnson et al. 2009b	Sunshine, AZ	WEST and the CPRS 2006
Combine Hills, OR	Young et al. 2003c	Zintel Canyon, WA	Erickson et al. 2002a, 2003c	Dry Lake, AZ	Young et al. 2007b
Desert Claim, WA	Young et al. 2003b	Nine Canyon, WA	Erickson et al. 2001	Alta East (2011), CA	Chatfield et al. 2011
Hopkins Ridge, WA	Young et al. 2003a	Maiden, WA	Young et al. 2002	Alta East (2010), CA	Chatfield et al. 2011
Reardon, WA	WEST 2005b	Hatchet Ridge, CA	Young et al. 2007a	San Gorgonio, CA	Anderson et al. 2000, Erickson et al. 2002b
Stateline Reference, OR	URS et al. 2001	Bitter Root. MN	Derby and Dahl 2009	AOCM (CPC East), CA	Chatfield et al. 2010
Buffalo Ridge, MN	Johnson et al. 2000a	Timber Road (Phase II), OH	Good et al. 2010	Beethoven, SD	Derby and Thorn 2014
White Creek, WA	NWC and WEST 2005	Biglow Canyon, OR	WEST 2005c		

Table 10. Raptor use (number of raptors/plot/20-minute survey) and fatality (number of bird fatalities/megawatt/year) estimates for wind-energy facilities in the Midwest with publicly available data.

Project Name	Raptor Use Estimate	Raptor Fatality Estimate	Total #of Turbines	Total MW	Use Reference	Fatality Reference
Barton I & II, IA (2010-2011)	NA	0	80	160.0		Derby et al. 2011a
Beethoven (2016-2016)	0.103	0.07	43	80.0	Derby and Thorn 2014	WEST 2016
Big Blue, MN (2013)	NA	0	18	36.0		Fagen Engineering 2014
Big Blue, MN (2014)	NA	0	18	36.0		Fagen Engineering 2015
Blue Sky Green Field, WI (2008; 2009)	NA	0	88	145.0		Gruver et al. 2009
Buffalo Ridge I, SD (2009-2010)	NA	0.20	24	50.4		Derby et al. 2010b
Buffalo Ridge II, SD (2011-2012)	NA	0	105	210.0		Derby et al. 2012a
Buffalo Ridge, MN (Phase I; 1996)	NA	0	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase I; 1997)	NA	0	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase I; 1998)	NA	0	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase I; 1999)	NA	0.47	73	25.0		Johnson et al. 2000a
Buffalo Ridge, MN (Phase II; 1998)	NA	0	143	107.3		Johnson et al. 2000a
Buffalo Ridge, MN (Phase II; 1999)	NA	0	143	107.3		Johnson et al. 2000a
Buffalo Ridge, MN (Phase III; 1999)	NA	0	138	103.5		Johnson et al. 2000a
Cedar Ridge, WI (2009)	NA	0.18	41	67.6		BHE Environmental 2010
Cedar Ridge, WI (2010)	NA	0.13	41	68.0		BHE Environmental 2011
Elm Creek II, MN (2009-2010)	NA	0	67	100.0		Derby et al. 2010c
Elm Creek, MN (20011-2012)	NA	0	62	148.8		Derby et al. 2012b
Fowler I, IN (2009)	NA	0	162	301.0		Johnson et al. 2010
Grand Ridge I, IL (2009-2010)	0.2	0	66	99.0	Derby et al. 2009	Derby et al. 2010g
Kewaunee County, WI (1999-2001)	NA	0	31	20.5		Howe et al. 2002
Moraine II, MN (2009)	NA	0.37	33	49.5		Derby et al. 2010d
NPPD Ainsworth, NE (2006)	NA	0.06	36	20.5		Derby et al. 2007
Pioneer Prairie II, IA (2011-2012)	NA	0	62	102.3		Chodachek et al. 2012
PrairieWinds ND1 (Minot), ND (2010)	NA	0.05	80	115.5		Derby et al. 2011c
PrairieWinds ND1 (Minot), ND (2011)	NA	0.05	80	115.5		Derby et al. 2012c
PrairieWinds SD1, SD (2011-2012)	NA	0	108	162.0		Derby et al. 2012d
PrairieWinds SD1, SD (2012-2013)	NA	0.03	108	162.0		Derby et al. 2013
PrairieWinds SD1, SD (2013-2014)	NA	0.17	108	162.0		Derby et al. 2014
Rail Splitter, IL (2012-2013)	NA	0	67	100.5		Good et al. 2013
Ripley, Ont (2008)	NA	0.10	38	76.0		Jacques Whitford 2009
Rugby, ND (2010-2011)	NA	0.06	71	149.0		Derby et al. 2011b
Top of Iowa, IA (2003)	NA	0	89	80.0		Jain 2005
Top of Iowa, IA (2004)	NA	0.17	89	80.0		Jain 2005
Wessington Springs, SD (2009)	0.23	0.06	34	51.0	Derby et al. 2008	Derby et al. 2010f

Table 10. Raptor use (number of raptors/plot/20-minute survey) and fatality (number of bird fatalities/megawatt/year) estimates for wind-energy facilities in the Midwest with publicly available data.

Project Name	Raptor Use Estimate	Raptor Fatality Estimate	Total #of Turbines	Total MW	Use Reference	Fatality Reference
Wessington Springs, SD (2010)	0.23	0.07	34	51.0	Derby et al. 2008	Derby et al. 2011d
Winnebago, IA (2009-2010)	NA	0.27	10	20.0		Derby et al. 2010e

This fixed-point bird use survey was designed to provide a relative index of use by raptors during all seasons at the Project. While mean diurnal raptor use was higher during the fall and spring (0.55 and 0.51 raptors/800-m plot/20-min survey), probably due to an influx of migrant birds, the Project is not located within a known raptor migration corridor, and there are no features unique to the Project area, as compared to adjacent areas, that would appear to attract large numbers of diurnal raptors. Furthermore, raptor fatality rates reported from studies in the Midwest are typically low. Site-specific and regional data suggest there is some potential for raptor mortality, but these potential impacts to individuals are unlikely to cause significant adverse impacts to raptor populations. Likewise, there is some potential for habitat loss and displacement of individuals, but the resources available within the Project area are widely available at the local landscape level; therefore, any diurnal raptor habitat loss and displacement attributable to the Project is unlikely to result in significant adverse population-level impacts to raptors.

While abundance is intuitively connected to raptor fatality risk to some degree, risk is likely influenced by other factors as well, such as species-specific flight behaviors. Diurnal raptors were observed flying within all three fleight height categories; although the majority (53.6%) of diurnal raptors were observed flying within RSH, some differences were observed among raptor suptypes. A higher proportion of buteos and eagles flew within the RSH compared to other raptor types, while most of the harriers were observed flying below RSH, potentially indicating that some species may have a higher risk for collision; however, many of these are based on a few individual observations.

Species-Specific Summaries

American white Pelican, white-faced ibis, bufflehead, and common merganser

A single flock of 10 American white pelicans was recorded flying over the Project area in the spring; one white-faced ibis was recorded flying over the Project area in the summer; one group of 12 bufflehead was recorded using open water habitats within the Project area in the fall; and two common merganser groups, totaling 10 individuals, were observed flying over or using open water habitats within the Project area in the winter and spring. The limited number of sightings suggests that the Project area is not a major stopover or breeding area for any of these non-listed special-status species. Furthermore, habitats within the Project area are not unique in the general region, thus development of the Project would likely have minimal population-level impacts.

Great blue heron

Five great blue herons, a common summer resident and migrant in South Dakota, were recorded during the surveys conducted at the Project. Site-specific data indicate that use of the Project area by this species is low and population-level effects from Project development are unlikely.

Bald and golden eagles

A total of 24 bald eagle observations (20 during 60-min surveys and regardless of distance from observer, and four incidentally) were recorded within the Project area during Year Two surveys conducted from May 3, 2016 – April 19, 2017 (Table 4). The majority of total eagle minutes were accounted for during one survey in spring 2017 when two groups, totaling nine individual bald eagles, were observed at Point 9 for 72 total minutes. The majority (71.4%) of flying bald eagles recorded during fixed-point bird use surveys were observed within the RSH (Table 5). Bald eagles are uncommon in migration, summer, and winter throughout South Dakota; however, they are locally common below the Missouri River dams in winter and nesting within the State is increasingly reported (South Dakota Birds, Birding, and Nature 2017).

One golden eagle was recorded incidentally in the winter of 2016; no golden eagle nests were recorded during raptor nest surveys conducted in April of 2016, with most golden eagle nesting habitat in South Dakota found in the western portion of the state. Golden eagles are generally found on wide open prairies in the western half of the US (All About Birds 2017). In South Dakota, golden eagles are very often found on the Fort Pierre National Grasslands, located approximately 289.7 km (180 mi) northwest of the Project area, especially in winter and migration (South Dakota Birds, Birding, and Nature 2017).

The number and timing of eagle observations recorded during Year Two of the fixed-point bird use surveys suggest that year-round eagle use is expected. The presence of active bald eagle nests in the vicinity of the Project (Derby 2016) indicates bald eagles are present in the general area for an extended period of time (breeding season). Thus, development of the Project may influence individuals moving through or using the Project area, but given low use and apparent relatively low susceptibility of bald eagles to turbine impacts, potential impact to bald eagle populations appears minimal.

Swainson’s and Ferruginous Hawk

There were two observations of Swainson’s and three observations of ferruginous hawks during the Year Two study period (Table 4). Both of the Swainson’s hawk observations were of flying individuals within the RSH and one of the three ferruginous hawk observations were within the RSH (Table 6). Swainson’s hawks are common in South Dakota and utilize a variety of habitats, including open grasslands with occasional trees and shrubs, wetland edges, and agriculture fields, nesting in trees, shrubs, or occasionally on the ground (South Dakota Birds, Birding, and Nature 2017). Ferruginous hawk, an uncommon migrant and summer resident, is rarely observed in winter, and inhabits grasslands and open areas (South Dakota Birds, Birding, and Nature 2017).

The potential for individual mortality does exist for both species; however, the low number of fatalities reported throughout projects in the Midwest (one Swainson’s hawk and no ferruginous hawk fatalities out of 55 total reported fatalities) suggests that these species are not particularly susceptible to turbine collisions in the Midwest. Collision mortality may affect a few individuals, but are unlikely to cause significant adverse impacts to either populations of the species.

Sharp-shinned and Cooper's Hawk

Two sharp-shinned hawks and one Cooper's hawk were recorded during the study period (Table 4). Both are an uncommon migrant in South Dakota, generally preferring wooded areas (South Dakota Birds, Birding, and Nature 2017). Only two Cooper's hawks and no sharp-shinned hawks have been found as fatalities through projects in the Midwest. Collision mortality may affect a few individuals of these species, but significant population-level impacts are unlikely.

Peregrine Falcon

Peregrine falcons, listed as endangered in the state of South Dakota, can be found in a variety of habitats, including tundra, moorlands, steppe, and seacoasts, especially where there are suitable nesting cliffs, mountains, open forested regions, and human population centers (All About Birds 2017). When not breeding, they occur in areas where prey concentrate, including farmlands, marshes, lakeshores, river mouths, tidal flats, dunes and beaches, broad river valleys, cities, and airports. Still uncommon throughout most of its former range, reintroduction programs and natural reproduction are resulting in slowly increasing numbers and range (South Dakota Birds, Birding, and Nature 2017). In 2017, the SDGFP confirmed that two pairs of peregrine falcons successfully nested in the Black Hills of South Dakota, located approximately 300 miles west of the Project (Capital Journal 2017).

One juvenile peregrine falcon was recorded during the Year Two fixed-point bird use surveys, using grassland habitats within the Project area during the fall of 2016. Peregrine falcons have been reported in the general region where the Project is located, the closest one recorded on April of 2017 in Bon Homme County along the Missouri River, approximately 20 km (12.4 mi) to the southeast of the Project area (eBird 2017). Significant use of the Project area is unlikely due to the lack of nesting habitat and negative impacts from Project development are not expected.

YEAR ONE AND YEAR TWO SURVEYS COMPARISON SUMMARY

Ninety unique bird species were recorded during Year Two of bird use surveys compared to 72 unique bird species recorded in Year One of surveys conducted at the Project area, mainly due to a higher number of species recorded in the summer of 2016 – 2017 (60 unique species) compared to the summer of 2015 – 2016 (43 unique species). Temporal patterns of bird use were similar between years, with summer having the highest overall use, followed by migration seasons, and use being the lowest during winter. Species richness patterns were also similar between years, with overall species richness being higher for small birds compared to large birds; however, small bird species richness recorded in Year Two was almost twice as the small bird species richness recorded during Year One of surveys (2.64 and 1.64 mean number of species/plot/20-min survey, respectively).

Passerines were the most recorded bird type in both Year One and Year Two of surveys; two species composed approximately one-third (29%) of all observations in Year Two, compared to six species that composed approximately half (52%) of all observation in Year One, with red-winged blackbird being one of the most common species in both years. Waterfowl accounted for the majority of large bird observations in both years, with snow geese being the most recorded waterfowl species in Year Two and Canada geese being the most recorded waterfowl species in Year One. Waterbirds accounted for 1.5% of the total bird observations in Year Two with four species; they composed 9% of the total bird observations in Year One with only two species. Sandhill cranes were the most recorded waterbird species in both years.

Sixty-nine diurnal raptor observations within 61 groups were recorded in Year Two, compared to 89 within 83 groups Year One. Number of unique diurnal raptor species was similar between years (five in Year Two and eight in Year One); diurnal raptor species composition was similar between years, with red-tailed hawk and northern harrier being the most recorded diurnal raptor species. Diurnal raptor species composition varied between years, with American kestrel, Swainson's hawk, and northern goshawk recorded only in Year One. Peregrine falcon was recorded only during Year Two surveys and golden eagle was observed (incidentally) only during the Year Two survey period.

Patterns of bird use varied seasonally between years. Large Bird use was highest in the spring and lowest in the summer in both years; small bird use patterns were different between years, with winter bird use being the lowest compared to any other season during Year Two surveys and the second highest during Year One surveys. Frequency of occurrence of waterbirds was similar between years, but mean use patterns were different, with waterbird use being recorded in all seasons but winter during Year Two surveys and only migration seasons during Year One surveys; almost 10 times less waterbird use was recorded in spring of Year Two surveys compared to Year One.

Diurnal raptor use was highest in the fall during both years; spring use was the second highest during Year Two and the lowest during Year One surveys. Species-specific patterns of use were different between years, with use by Cooper's hawk being observed only in the summer of Year Two surveys, and both the fall and winter of Year One surveys. Bald eagle use was observed in all seasons but summer during Year Two surveys, and only in the winter during Year One surveys. Winter passerine use was lowest compared to any other season during Year Two surveys and was the second highest during Year One surveys.

Spatial patterns of bird use were similar between years. Although use by point varied annually and seasonally, large bird use by point was largely driven by waterfowl (generally high across points) and shorebirds (lower but consistent across points). Diurnal raptors were observed at all points but one, with use largely driven by buteos and harriers.

Diurnal raptor use at the Project was low during both years (0.33 and 0.31 raptors/800-m plot/20-min survey during Year Two and Year One, respectively), compared to other US wind facilities and comparable to other wind energy facilities in the Midwest with publicly available data. Eagle use was different between years, being higher in Year Two (20 bald eagles for a total of 135 min) compared to Year One (four bald eagles for a total of 15 min). It is unknown why eagle use was higher in Year Two compared to Year One, but most use was focused on just a one day during migration in Year Two at point 9. Based on current Project design, Point 9 is no longer part of the planned Project area.

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Appendix A. Descriptive Statistics for Bird Species Recorded during Year Two of Fixed-Point Bird Use Surveys Conducted at the Prevailing Winds Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year Two fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

		Spring		Summer		Fall		Winter		Total	
Type/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
Loons/Grebes		**0**	**0**	**0**	**0**	**1**	**5**	**0**	**0**	**1**	**5**
unidentified grebe		0	0	0	0	1	5	0	0	1	5
Waterbirds		**6**	**46**	**4**	**74**	**5**	**20**	**0**	**0**	**15**	**140**
double-crested cormorant	*Phalacrocorax auritus*	1	4	0	0	2	17	0	0	3	21
glossy ibis	*Plegadis falcinellus*	0	0	2	3	0	0	0	0	2	3
great blue heron[a]	*Ardea herodias*	1	1	1	1	3	3	0	0	5	5
sandhill crane	*Antigone canadensis*	4	41	1	70	0	0	0	0	5	111
Waterfowl		**45**	**1,400**	**16**	**31**	**8**	**246**	**10**	**418**	**79**	**2,095**
blue-winged teal	*Anas discors*	5	10	7	12	0	0	0	0	12	22
bufflehead[a]	*Bucephala albeola*	0	0	0	0	1	12	0	0	1	12
cackling goose	*Branta hutchinsii*	3	74	0	0	0	0	0	0	3	74
Canada goose	*Branta canadensis*	4	21	0	0	0	0	2	8	6	29
common merganser[a]	*Mergus merganser*	0	0	0	0	0	0	1	1	1	1
greater white-fronted goose	*Anser albifrons*	2	129	0	0	0	0	2	350	4	479
green-winged teal	*Anas crecca*	0	0	1	1	1	2	0	0	2	3
mallard	*Anas platyrhynchos*	9	12	5	12	2	201	3	17	19	242
northern pintail	*Anas acuta*	2	10	0	0	0	0	0	0	2	10
northern shoveler	*Anas clypeata*	0	0	2	3	0	0	0	0	2	3
ring-necked duck	*Aythya collaris*	2	28	0	0	0	0	0	0	2	28
ruddy duck	*Oxyura jamaicensis*	0	0	0	0	1	1	0	0	1	1
snow goose	*Chen caerulescens*	7	496	1	3	0	0	0	0	8	499
unidentified duck		4	95	0	0	0	0	0	0	4	95
unidentified goose		4	480	0	0	0	0	0	0	4	480
unidentified waterfowl		3	45	0	0	3	30	2	42	8	117
Shorebirds		**41**	**58**	**20**	**26**	**12**	**443**	**1**	**1**	**74**	**528**
killdeer	*Charadrius vociferus*	41	58	18	23	7	21	0	0	66	102
unidentified shorebird		0	0	0	0	5	422	1	1	6	423
upland sandpiper	*Bartramia longicauda*	0	0	2	3	0	0	0	0	2	3
Gulls/Terns		**4**	**83**	**1**	**1**	**2**	**110**	**0**	**0**	**7**	**194**
Franklin's gull	*Leucophaeus pipixcan*	3	82	0	0	1	10	0	0	4	92
Herring gull	*Larus argentatus*	0	0	1	1	0	0	0	0	1	1
ring-billed gull	*Larus delawarensis*	1	1	0	0	0	0	0	0	1	1
unidentified gull		0	0	0	0	1	100	0	0	1	100

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year Two fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

		Spring		Summer		Fall		Winter		Total	
Type/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
Rails/Coots		**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**1**
American coot	*Fulica americana*	0	0	1	1	0	0	0	0	1	1
Diurnal Raptors		**19**	**24**	**11**	**13**	**25**	**26**	**6**	**6**	**61**	**69**
Accipiters		*0*	*0*	*1*	*1*	*0*	*0*	*0*	*0*	*1*	*1*
Cooper's hawk[a]	*Accipiter cooperii*	0	0	1	1	0	0	0	0	1	1
Buteos		*13*	*13*	*10*	*12*	*13*	*13*	*3*	*3*	*39*	*41*
red-tailed hawk	*Buteo jamaicensis*	12	12	9	11	11	11	0	0	32	34
rough-legged hawk	*Buteo lagopus*	0	0	0	0	2	2	3	3	5	5
unidentified buteo	*Buteo spp*	1	1	1	1	0	0	0	0	2	2
Northern Harrier		*3*	*4*	*0*	*0*	*7*	*7*	*0*	*0*	*10*	*11*
northern harrier	*Circus cyaneus*	3	4	0	0	7	7	0	0	10	11
Eagles		*1*	*4*	*0*	*0*	*1*	*1*	*2*	*2*	*4*	*7*
bald eagle[a,b,c]	*Haliaeetus leucocephalus*	1	4	0	0	1	1	2	2	4	7
Other Raptors		*2*	*3*	*0*	*0*	*4*	*5*	*1*	*1*	*7*	*9*
unidentified raptor		2	3	0	0	4	5	1	1	7	9
Vultures		**1**	**1**	**5**	**7**	**1**	**1**	**0**	**0**	**7**	**9**
turkey vulture	*Cathartes aura*	1	1	5	7	1	1	0	0	7	9
Upland Game Birds		**29**	**44**	**9**	**10**	**9**	**16**	**1**	**1**	**48**	**71**
ring-necked pheasant	*Phasianus colchicus*	27	28	9	10	8	9	1	1	45	48
wild turkey	*Meleagris gallopavo*	2	16	0	0	1	7	0	0	3	23
Doves/Pigeons		**10**	**16**	**39**	**61**	**12**	**68**	**1**	**7**	**62**	**152**
Eurasian collared-dove	*Streptopelia decaocto*	0	0	6	8	1	1	0	0	7	9
mourning dove	*Zenaida macroura*	8	12	33	53	7	27	0	0	48	92
rock pigeon	*Columba livia*	2	4	0	0	4	40	1	7	7	51
Large Corvids		**8**	**68**	**1**	**1**	**4**	**26**	**5**	**5**	**18**	**100**
American crow	*Corvus brachyrhynchos*	8	68	1	1	4	26	5	5	18	100
Passerines		**166**	**1,054**	**321**	**1,829**	**137**	**2,655**	**57**	**317**	**681**	**5,855**
alder flycatcher	*Empidonax alnorum*	0	0	1	1	0	0	0	0	1	1
American goldfinch	*Spinus tristis*	0	0	13	13	10	19	4	15	27	47
American robin	*Turdus migratorius*	14	25	16	21	13	52	5	8	48	106
American tree sparrow	*Spizella arborea*	0	0	0	0	0	0	2	7	2	7
Baltimore oriole	*Icterus galbula*	0	0	2	2	0	0	0	0	2	2
barn swallow	*Hirundo rustica*	4	5	24	63	0	0	0	0	28	68

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year Two fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

		Spring		Summer		Fall		Winter		Total	
Type/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
blue jay	*Cyanocitta cristata*	0	0	4	4	6	8	0	0	10	12
bobolink	*Dolichonyx oryzivorus*	0	0	5	5	0	0	0	0	5	5
Brewer's blackbird	*Euphagus cyanocephalus*	0	0	1	4	2	3	0	0	3	7
brown-headed cowbird	*Molothrus ater*	10	16	29	64	8	293	0	0	47	373
brown thrasher	*Toxostoma rufum*	1	1	3	4	1	1	0	0	5	6
clay-colored sparrow	*Spizella pallida*	0	0	0	0	1	1	0	0	1	1
cliff swallow	*Petrochelidon pyrrhonota*	1	25	25	127	3	35	0	0	29	187
common grackle	*Quiscalus quiscula*	6	18	17	1,032	7	540	0	0	30	1,590
common yellowthroat	*Geothlypis trichas*	0	0	5	5	0	0	0	0	5	5
dickcissel	*Spiza americana*	0	0	13	15	0	0	0	0	13	15
eastern bluebird	*Sialia sialis*	1	1	2	2	0	0	1	5	4	8
eastern kingbird	*Tyrannus tyrannus*	1	2	26	45	0	0	0	0	27	47
European starling	*Sturnus vulgaris*	5	14	0	0	7	238	0	0	12	252
field sparrow	*Spizella pusilla*	1	1	3	3	0	0	0	0	4	4
horned lark	*Eremophila alpestris*	13	39	1	1	11	80	35	266	60	386
house finch	*Haemorhous mexicanus*	0	0	2	2	0	0	0	0	2	2
house sparrow	*Passer domesticus*	0	0	4	15	0	0	0	0	4	15
house wren	*Troglodytes aedon*	0	0	1	1	1	1	0	0	2	2
Lincoln's sparrow	*Melospiza lincolnii*	0	0	1	1	0	0	0	0	1	1
marsh wren	*Cistothorus palustris*	0	0	4	4	0	0	0	0	4	4
northern shrike	*Lanius excubitor*	0	0	0	0	1	1	2	2	3	3
orchard oriole	*Icterus spurius*	0	0	3	3	0	0	0	0	3	3
red-winged blackbird	*Agelaius phoeniceus*	23	631	45	235	16	239	0	0	84	1,105
Savannah sparrow	*Passerculus sandwichensis*	1	1	0	0	0	0	0	0	1	1
snow bunting	*Plectrophenax nivalis*	0	0	0	0	0	0	6	12	6	12
song sparrow	*Melospiza melodia*	2	2	7	7	3	53	0	0	12	62
spotted towhee	*Pipilo maculatus*	0	0	1	1	0	0	0	0	1	1
swamp sparrow	*Melospiza georgiana*	0	0	1	1	0	0	0	0	1	1
tree swallow	*Tachycineta bicolor*	2	3	0	0	0	0	0	0	2	3
unidentified blackbird		6	92	0	0	12	998	0	0	18	1,090
unidentified sparrow		3	9	1	1	10	36	1	1	15	47
vesper sparrow	*Pooecetes gramineus*	3	3	5	6	1	3	0	0	9	12
western bluebird	*Sialia mexicana*	0	0	2	2	0	0	0	0	2	2
western kingbird	*Tyrannus verticalis*	0	0	2	2	0	0	0	0	2	2

Appendix A1. Summary of individuals and group observations, regardless of distance from observer, by bird type and species recorded during the first 20 minutes of Year Two fixed-point bird use surveys conducted in the Prevailing Winds Wind Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

		Spring		Summer		Fall		Winter		Total	
Type/Species	**Scientific Name**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**	**# Grps**	**# Obs**
western meadowlark	*Sturnella neglecta*	67	150	42	49	24	54	1	1	134	254
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	2	16	6	82	0	0	0	0	8	98
yellow warbler	*Setophaga petechia*	0	0	4	6	0	0	0	0	4	6
Goatsuckers		**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**1**	**1**
common nighthawk	*Chordeiles minor*	0	0	1	1	0	0	0	0	1	1
Woodpeckers		**1**	**1**	**6**	**6**	**7**	**8**	**0**	**0**	**14**	**15**
downy woodpecker	*Picoides pubescens*	0	0	0	0	1	1	0	0	1	1
northern flicker	*Colaptes auratus*	0	0	2	2	4	5	0	0	6	7
red-bellied woodpecker	*Melanerpes carolinus*	0	0	2	2	0	0	0	0	2	2
red-headed woodpecker	*Melanerpes erythrocephalus*	1	1	2	2	2	2	0	0	5	5
Kingfishers		**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**1**	**1**
belted kingfisher	*Megaceryle alcyon*	0	0	0	0	1	1	0	0	1	1
Unidentified Birds		**9**	**16**	**0**	**0**	**3**	**13**	**8**	**11**	**20**	**40**
unidentified bird (small)		9	16	0	0	3	13	8	11	20	40
Overall		**339**	**2,811**	**435**	**2,061**	**227**	**3,638**	**89**	**766**	**1,090**	**9,276**

Grps = Number of groups, # Obs = Number of observations

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

[b.] State Species of Greatest Conservation Need (SDGFP 2014)

[c.] Bald and Golden Eagle Protection Act (1940)

Appendix A2. Mean large bird use (number of large birds/800-meter radius plot/20-minute survey), percent of total use, and frequency of occurrence for each large bird type and species by season during Year Two of the fixed-point bird use surveys conducted at the Prevailing Winds Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

	Mean Use				Percent of Use (%)				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Loons/Grebes	**0**	**0**	**0.1**	**0**	**0**	**0**	**0.5**	**0**	**0**	**0**	**2.1**	**0**
unidentified grebe	0	0	0.1	0	0	0	0.5	0	0	0	2.1	0
Waterbirds	**0.96**	**1.23**	**0.42**	**0**	**2.6**	**33.7**	**2.1**	**0**	**10.6**	**4.8**	**6.4**	**0**
double-crested cormorant	0.09	0	0.35	0	0.2	0	1.8	0	2.2	0	4.2	0
glossy ibis	0	0.05	0	0	0	1.3	0	0	0	3.1	0	0
great blue heron[a]	0.02	0.02	0.06	0	<0.1	0.4	0.3	0	2.1	1.6	6.4	0
sandhill crane	0.85	1.17	0	0	2.3	32	0	0	6.2	1.7	0	0
Waterfowl	**29.2**	**0.48**	**5.12**	**8.71**	**80.3**	**13.3**	**25.5**	**95.4**	**44.7**	**7.8**	**6.2**	**8.3**
blue-winged teal	0.22	0.19	0	0	0.6	5.1	0	0	11.1	6.2	0	0
bufflehead[a]	0	0	0.25	0	0	0	1.2	0	0	0	2.1	0
cackling goose	1.54	0	0	0	4.2	0	0	0	6.2	0	0	0
Canada goose	0.44	0	0	0.17	1.2	0	0	1.8	8.5	0	0	2.1
common merganser[a]	0	0	0	0.02	0	0	0	0.2	0	0	0	2.1
greater white-fronted goose	2.69	0	0	7.29	7.4	0	0	79.9	4.2	0	0	2.1
green-winged teal	0	0.02	0.04	0	0	0.4	0.2	0	0	1.6	2.1	0
mallard	0.26	0.19	4.19	0.35	0.7	5.1	20.8	3.9	17.1	3.1	4.2	4.2
northern pintail	0.21	0	0	0	0.6	0	0	0	4.2	0	0	0
northern shoveler	0	0.05	0	0	0	1.3	0	0	0	3.1	0	0
ring-necked duck	0.58	0	0	0	1.6	0	0	0	4.2	0	0	0
ruddy duck	0	0	0.02	0	0	0	0.1	0	0	0	2.1	0
snow goose	10.34	0.05	0	0	28.4	1.3	0	0	10.6	1.6	0	0
unidentified duck	1.98	0	0	0	5.4	0	0	0	8.5	0	0	0
unidentified goose	10	0	0	0	27.5	0	0	0	8.3	0	0	0
unidentified waterfowl	0.94	0	0.62	0.88	2.6	0	3.1	9.6	6.2	0	2.1	4.2
Shorebirds	**1.21**	**0.41**	**9.26**	**0.02**	**3.3**	**11.3**	**46**	**0.2**	**52.2**	**30.2**	**25.8**	**2.1**
killdeer	1.21	0.37	0.47	0	3.3	10.1	2.3	0	52.2	28.6	15.4	0
unidentified shorebird	0	0	8.79	0.02	0	0	43.7	0.2	0	0	10.4	2.1
upland sandpiper	0	0.05	0	0	0	1.3	0	0	0	3.1	0	0
Gulls/Terns	**1.77**	**0.02**	**2.29**	**0**	**4.9**	**0.5**	**11.4**	**0**	**8.5**	**1.7**	**4.2**	**0**
Franklin's gull	1.75	0	0.21	0	4.8	0	1	0	6.4	0	2.1	0
Herring gull	0	0.02	0	0	0	0.5	0	0	0	1.7	0	0
ring-billed gull	0.02	0	0	0	<0.1	0	0	0	2.1	0	0	0
unidentified gull	0	0	2.08	0	0	0	10.4	0	0	0	2.1	0
Rails/Coots	**0**	**0.02**	**0**	**0**	**0**	**0.4**	**0**	**0**	**0**	**1.6**	**0**	**0**
American coot	0	0.02	0	0	0	0.4	0	0	0	1.6	0	0

Appendix A2. Mean large bird use (number of large birds/800-meter radius plot/20-minute survey), percent of total use, and frequency of occurrence for each large bird type and species by season during Year Two of the fixed-point bird use surveys conducted at the Prevailing Winds Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

	Mean Use				Percent of Use (%)				Frequency of Occurrence (%)			
Type/Species	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Diurnal Raptors	**0.51**	**0.21**	**0.55**	**0.12**	**1.4**	**5.7**	**2.7**	**1.4**	**33.9**	**15.9**	**38.2**	**8.3**
Accipiters	*0*	*0.02*	*0*	*0*	*0*	*0.5*	*0*	*0*	*0*	*1.7*	*0*	*0*
Cooper's hawk[a]	0	0.02	0	0	0	0.5	0	0	0	1.7	0	0
Buteos	*0.28*	*0.19*	*0.28*	*0.06*	*0.8*	*5.2*	*1.4*	*0.7*	*23.3*	*14.3*	*25.4*	*6.2*
red-tailed hawk	0.25	0.17	0.23	0	0.7	4.8	1.2	0	21.1	12.7	21.2	0
rough-legged hawk	0	0	0.04	0.06	0	0	0.2	0.7	0	0	4.2	6.2
unidentified buteo	0.02	0.02	0	0	<0.1	0.4	0	0	2.2	1.6	0	0
Northern Harrier	*0.09*	*0*	*0.15*	*0*	*0.2*	*0*	*0.7*	*0*	*6.4*	*0*	*14.9*	*0*
northern harrier	0.09	0	0.15	0	0.2	0	0.7	0	6.4	0	14.9	0
Eagles	*0.08*	*0*	*0.02*	*0.04*	*0.2*	*0*	*0.1*	*0.5*	*2.1*	*0*	*2.1*	*2.1*
bald eagle[a,b,c]	0.08	0	0.02	0.04	0.2	0	0.1	0.5	2.1	0	2.1	2.1
Other Raptors	*0.06*	*0*	*0.1*	*0.02*	*0.2*	*0*	*0.5*	*0.2*	*4.2*	*0*	*8.3*	*2.1*
unidentified raptor	0.06	0	0.1	0.02	0.2	0	0.5	0.2	4.2	0	8.3	2.1
Vultures	**0.02**	**0.11**	**0.02**	**0**	**<0.1**	**3.1**	**0.1**	**0**	**2.2**	**8**	**2.2**	**0**
turkey vulture	0.02	0.11	0.02	0	<0.1	3.1	0.1	0	2.2	8	2.2	0
Upland Game Birds	**0.93**	**0.16**	**0.34**	**0.02**	**2.6**	**4.4**	**1.7**	**0.2**	**53.8**	**12.7**	**19**	**2.1**
ring-necked pheasant	0.6	0.16	0.19	0.02	1.7	4.4	0.9	0.2	51.7	12.7	16.8	2.1
wild turkey	0.33	0	0.16	0	0.9	0	0.8	0	4.2	0	2.2	0
Doves/Pigeons	**0.34**	**0.98**	**1.45**	**0.15**	**0.9**	**26.8**	**7.2**	**1.6**	**17.2**	**49.5**	**15**	**2.1**
Eurasian collared-dove	0	0.13	0.02	0	0	3.5	0.1	0	0	8	2.2	0
mourning dove	0.26	0.85	0.6	0	0.7	23.2	3	0	13.1	43	10.8	0
rock pigeon	0.08	0	0.83	0.15	0.2	0	4.1	1.6	4.2	0	6.2	2.1
Large Corvids	**1.42**	**0.02**	**0.54**	**0.1**	**3.9**	**0.5**	**2.7**	**1.1**	**14.7**	**1.7**	**2.1**	**6.2**
American crow	1.42	0.02	0.54	0.1	3.9	0.5	2.7	1.1	14.7	1.7	2.1	6.2
Goatsuckers	**0**	**0.02**	**0**	**0**	**0**	**0.4**	**0**	**0**	**0**	**1.6**	**0**	**0**
common nighthawk	0	0.02	0	0	0	0.4	0	0	0	1.6	0	0
Overall	**36.38**	**3.65**	**20.11**	**9.12**	**100**	**100**	**100**	**100**				

Note: Totals by bird type and overall might not correspond to the sum of individual species due to rounding

[a.] State Species of Concern tracked by the South Dakota Natural Heritage Program (SDGFP 2017)

[b.] State Species of Greatest Conservation Need (SDGFP 2014)

[c.] Bald and Golden Eagle Protection Act (1940)

Appendix A3. Mean small bird use (number of large birds/100-meter plot/20-minute survey), percent of total use, and frequency of occurrence for each small bird type and species by season during Year Two of the fixed-point bird use surveys conducted at the Prevaling Winds Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

	Mean Use				Percent of Use (%)				Frequency of Occurrence %)			
	Spring	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
Passerines	**22.10**	**28.8**	**35.31**	**6.58**	**99.2**	**99.7**	**98.8**	**96.9**	**97.9**	**96.9**	**75.0**	**62.5**
alder flycatcher	0	0.02	0	0	0	<0.1	0	0	0	1.6	0	0
American goldfinch	0	0.21	0.41	0.31	0	0.7	1.2	4.6	0	21.2	21.9	6.2
American robin	0.53	0.34	0.40	0.17	2.4	1.2	1.1	2.5	21.2	23.8	10.8	8.3
American tree sparrow	0	0	0	0.15	0	0	0	2.1	0	0	0	2.1
Baltimore oriole	0	0.03	0	0	0	0.1	0	0	0	3.1	0	0
barn swallow	0.11	1.00	0	0	0.5	3.4	0	0	8.8	31.7	0	0
blue jay	0	0.07	0.04	0	0	0.2	0.1	0	0	6.6	4.4	0
bobolink	0	0.08	0	0	0	0.3	0	0	0	6.2	0	0
Brewer's blackbird	0	0.07	0.07	0	0	0.2	0.2	0	0	1.7	4.4	0
brown-headed cowbird	0.36	1.00	6.51	0	1.6	3.5	18.2	0	15.6	36.1	15.6	0
brown thrasher	0.02	0.06	0.02	0	<0.1	0.2	<0.1	0	2.2	4.8	2.2	0
clay-colored sparrow	0	0	0.02	0	0	0	<0.1	0	0	0	2.2	0
cliff swallow	0.56	2.06	0.78	0	2.5	7.1	2.2	0	2.2	38.5	6.7	0
common grackle	0.38	16.14	12.00	0	1.7	55.9	33.6	0	8.3	22.4	11.1	0
common yellowthroat	0	0.08	0	0	0	0.3	0	0	0	7.9	0	0
dickcissel	0	0.23	0	0	0	0.8	0	0	0	17.2	0	0
eastern bluebird	0.02	0.03	0	0.10	<0.1	0.1	0	1.5	2.1	3.3	0	2.1
eastern kingbird	0.04	0.71	0	0	0.2	2.5	0	0	2.2	34.6	0	0
European starling	0.29	0	0.8	0	1.3	0	2.2	0	10.4	0	10.7	0
field sparrow	0.02	0.05	0	0	<0.1	0.2	0	0	2.1	4.7	0	0
horned lark	0.81	0.02	1.67	5.54	3.6	<0.1	4.7	81.6	22.9	1.6	14.6	45.8
house finch	0	0.03	0	0	0	0.1	0	0	0	3.2	0	0
house sparrow	0	0.25	0	0	0	0.9	0	0	0	6.4	0	0
house wren	0	0.02	0.02	0	0	<0.1	<0.1	0	0	1.7	2.2	0
Lincoln's sparrow	0	0.02	0	0	0	<0.1	0	0	0	1.6	0	0
marsh wren	0	0.06	0	0	0	0.2	0	0	0	6.2	0	0
northern shrike	0	0	0.02	0.02	0	0	<0.1	0.3	0	0	2.1	2.1
orchard oriole	0	0.05	0	0	0	0.2	0	0	0	4.8	0	0
red-winged blackbird	13.19	3.67	5.28	0	59.2	12.7	14.8	0	34.2	50.6	30.6	0
Savannah sparrow	0.02	0	0	0	<0.1	0	0	0	2.1	0	0	0
snow bunting	0	0	0	0.25	0	0	0	3.7	0	0	0	10.4
song sparrow	0.04	0.11	1.18	0	0.2	0.4	3.3	0	4.2	11.1	6.7	0
spotted towhee	0	0.02	0	0	0	<0.1	0	0	0	1.6	0	0

Appendix A3. Mean small bird use (number of large birds/100-meter plot/20-minute survey), percent of total use, and frequency of occurrence for each small bird type and species by season during Year Two of the fixed-point bird use surveys conducted at the Prevaling Winds Project in Bon Homme and Charles Mix counties, South Dakota, from May 3, 2016 – April 19, 2017.

	Mean Use				Percent of Use (%)				Frequency of Occurrence %)			
	Spring	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**	**Spring**	**Summer**	**Fall**	**Winter**
swamp sparrow	0	0.02	0	0	0	<0.1	0	0	0	1.6	0	0
tree swallow	0.07	0	0	0	0.3	0	0	0	4.4	0	0	0
unidentified blackbird	1.92	0	4.19	0	8.6	0	11.7	0	10.4	0	4.2	0
unidentified sparrow	0.19	0.02	0.76	0.02	0.8	<0.1	2.1	0.3	4.2	1.6	21.1	2.1
vesper sparrow	0.07	0.09	0.07	0	0.3	0.3	0.2	0	4.4	6.2	2.2	0
western bluebird	0	0.03	0	0	0	0.1	0	0	0	3.1	0	0
western kingbird	0	0.02	0	0	0	<0.1	0	0	0	1.6	0	0
western meadowlark	3.14	0.78	1.07	0.02	14.1	2.7	3	0.3	71.7	52.1	39.3	2.1
yellow-headed blackbird	0.33	1.36	0	0	1.5	4.7	0	0	2.1	6.4	0	0
yellow warbler	0	0.10	0	0	0	0.3	0	0	0	6.4	0	0
Woodpeckers	0.02	0.10	0.13	0	<0.1	0.3	0.4	0	2.2	9.8	10.7	0
downy woodpecker	0	0	0.02	0	0	0	<0.1	0	0	0	2.1	0
northern flicker	0	0.03	0.06	0	0	0.1	0.2	0	0	3.3	4.2	0
red-bellied woodpecker	0	0.03	0	0	0	0.1	0	0	0	3.3	0	0
red-headed woodpecker	0.02	0.03	0.04	0	<0.1	0.1	0.1	0	2.2	3.1	4.4	0
Kingfishers	0	0	0.02	0	0	0	<0.1	0	0	0	2.1	0
belted kingfisher	0	0	0.02	0	0	0	<0.1	0	0	0	2.1	0
Unidentified Birds	0.17	0	0.27	0.21	0.7	0	0.8	3.1	12.5	0	6.2	12.5
unidentified bird (small)	0.17	0	0.27	0.21	0.7	0	0.8	3.1	12.5	0	6.2	12.5
Overall	22.29	28.9	35.73	6.79	100	100	100	100				

Note: Totals by bird type and overall might not correspond to the sum of individual species due to rounding

APPENDIX H - BALD EAGLE NEST MONITORING

Available upon request.

APPENDIX I - NORTHERN LONG-EARED BAT ACOUSTIC SURVEY

NORTHERN LONG-EARED BAT ACOUSTIC SURVEY REPORT FOR PROJECT FEASIBLITY AND LOCATION

Prevailing Winds Study Area in Bon Homme and Charles Mix Counties, South Dakota

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REPORT REFERENCE

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INTRODUCTION

Prevailing Winds, LLC (Prevailing Winds), is considering the development of the Prevailing Winds Wind Farm (Project), located in Bon Homme and Charles Mix Counties, South Dakota. To help in siting the eventual Project, Prevailing Winds evaluated a large Study Area (see Figure 1 for depiction of the Study Area as defined for 2015 studies). Prevailing Winds requested that Western Ecosystems Technology, Inc. (WEST) evaluate the potential for the federally threatened northern long-eared bat (*Myotis septentrionalis*; [NLEB]) to occur within the 2015 Study Area during the summer months. This report describes the results of the NLEB presence or probable absence acoustical assessment completed for the Study Area by WEST. These surveys were conducted following the survey recommendations found in the U.S. Fish and Wildlife Service (USFWS) *Northern Long-eared Bat Interim Conference and Planning Guidance* (USFWS 2014a) and *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2015).

NORTHERN LONG-EARED BAT SUMMER HABITAT REQUIREMENTS

NLEB are forest dependent species, generally relying on forest features for both foraging and roosting during the summer months (USFWS 2013; USFWS 2007). In particular, NLEB appear to be a forest interior species that require adequate canopy closure for both roost and foraging habitat (Lausen 2009). Additionally, riparian areas are considered critical resource areas for many species of bats because they support higher concentrations of prey, provide drinking areas, and act as unobstructed commuting corridors (Grindal et al. 1999). While NLEB are associated with forest habitats, they also occur in agricultural settings where forest habitats have been highly fragmented.

Wing morphology of the NLEB makes them ideally suited for the high maneuverability required for gleaning-type foraging within a cluttered forest interior (Henderson and Broders 2008). Abundance of NLEB prey items, particularly beetles and moths, are typically higher in more closed forest stands than in openings, which supports studies which have found that NLEB tend to avoid open habitats (Owen et al. 2003).

During the summer, NLEB roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees (USFWS 2007; USFWS 2013). Males and non-reproductive females may also roost in cooler places, like caves and mines. NLEB seem opportunistic in selecting roosts, using tree species based on suitability to retain bark or provide cavities or crevices. NLEB have also been found roosting in structures like barns and sheds.

During the summer months, NLEBs are unlikely to cross over large open lands (i.e., land lacking suitable habitat) to search for foraging and roosting habitats, but rather to use tree-lined linear features as travel corridors to and from roosting and foraging habitats (USFWS 2014a). These tree-lined corridors may be important for bats as navigational aids in agricultural landscapes, as protection from predators and wind, and may act to concentrate insect prey (Verboom and Huitema 1997). The NLEB is expected to be particularly tied to intact forested habitats; for example, Henderson and Broders (2008) found that NLEB did not travel more than 255 feet (78 meters) from the edge of intact forest structure. A study of nine female NLEBs using an intensively managed forest in West Virginia found this species forages in areas with forest patch sizes between 114 and 161 acres (46 and 65 hectares; Owen et al. 2003); however, studies in landscapes dominated by agricultural activities found NLEB can use woodlots and riparian zones with as little as 15 to 49 acres (6 to 20 hectares) of forest cover (Henderson and Broders 2008; Foster and Kurta 1999).

METHODS

Acoustic surveys followed the USFWS *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS 2015), per the *Northern Long-Eared Bat Interim Conference and Planning Guidance* (USFWS 2014a). The USFWS guidelines require one survey site for every 123 acres of suitable habitat for a minimum of four detector nights (USFWS 2014a). Two sampling locations at each survey site should then be surveyed for a minimum of two detector/nights each.

Initial desktop assessment of potential habitat conducted by WEST, identified approximately 1,180 acres of forested habitat; as such, this equates to 20 survey locations (two detectors per site). Although the USFWS protocol calls for 20 survey locations (10 sites with two detectors per site) for two detector/nights (for a total of 40 detector/nights), WEST surveyed 20 locations/stations for a minimum of two nights each for a total of 104 detector nights. WEST biologists deployed up to eight detectors at suitable sites throughout the Study Area for a minimum of four detector nights.

Acoustic surveys were conducted from July 21 – August 10, 2015 following USFWS guidelines (USFWS 2015). Bats were surveyed using SD1 or SD2 AnaBat™ ultrasonic detectors (Titley Electronics Pty Ltd., NSW, Australia), or SM2 Song Meter detectors (Wildlife Acoustics, Inc., Concord, Maine). Acoustic monitoring began before sunset and continued for the entire night. Survey duration at each site was for a minimum of two nights. If weather conditions such as persistent rain (> 30 minutes), strong winds (> 9 mph for > 30 minutes), or persistent cold temperatures (below 10°C [50°F] for > 30 minutes) occurred during the first five hours of a survey night, then that site was surveyed for an additional night (USFWS 2014). To maximize the quality of recorded echolocation calls, detectors were positioned at least 1.5 meters off the ground, at ≥ 45° angle, and with PVC tube weatherproofing (Britzke et al. 2010, USFWS 2014a). Sensitivity was set to "6" on AnaBat detectors, and the amplifier gain was set to 36 decibels for the SM2 units.

Bat calls were identified to species using Bat Call Identification (BCID; Allen 2012). If the identification program identified calls as NLEB at a site with a high degree of probability ($P < 0.05$), then qualitative analysis was conducted to determine if NLEB were present or absent at the site. Qualitative echolocation call analysis was conducted by a biologist experienced with acoustic identification and who met required USFWS qualifications (Dr. Kevin Murray of WEST; USFWS 2014a). If probable NLEB echolocation call sequences identified by BCID were not characteristic of NLEB, contained distinct calls produced by species other than NLEB, or were of insufficient quality, they were reclassified. Per USFWS guidelines, NLEB were considered present at sites with probable calls verified by qualitative analysis. NLEB were considered absent from sites with no probable NLEB calls or from sites with probable NLEB calls that were not verified by qualitative analysis. The Study Area lies well outside of the accepted range of Indiana bats; therefore Indiana bats were not included in the BCID model.

RESULTS

AnaBat and SM2 detectors were used to survey 20 acoustic survey locations, consisting of two detector stations per site, from July 21 – August 10, 2015. UTM coordinates and brief site descriptions for each site are listed in Table 1. Pictures and datasheets with site descriptions are found in Appendices A and B. WEST checked weather at the Hajek Farms, Tyndall, SD (KSDTYNDA2) weather station, which can be found on Weather Underground's Wundermap (http://www.wunderground.com/wundermap/). Weather conditions at sites 1, 2, 3, 4, 5, 6a, and 8 did not meet the standards for acoustic monitoring set by USFWS (2014a) on July 25 and at sites 6, 9, 10, and 11 on July 27 due to wind speeds sustaining greater than 9 miles per hour during the first five hours of survey on both nights. However, data on these nights were still included in the analysis because, while not ideal, conditions could still be suitable during a portion of the night and NLEB and other bats might still be detected. Weather conditions at all 20 locations for all other survey nights met the criteria established by the USFWS (2014a), and each detector location had at least two detector nights with good weather conditions (Table 2). Acoustic surveys were completed at 20 locations (two detector stations per site) for a total of 104 detector nights (Tables 1 and 2). BCID identified a total of 6,478 bat call files and identified 6,323 files (98%) to species, with an average of 62.3 bat calls per detector night (Table 2). Table 2 summarizes the number of detector nights, number of bat call files, and number of bat calls identified to species at each site. Table 3 provides information on species identifications for each site.

Based on the BCID analysis, nine stations (locations), recorded potential NLEB calls with a p-value less than 0.05 for the maximum-likelihood estimation (Table 4); therefore data from the nine stations were included in qualitative analysis (USFWS 2014a). Six stations (PW1, PW6a, PW8a, PW11, PW14, and PW16) recorded probable (i.e., p-value <0.05) NLEB calls on a single night only; stations PW9a and PW17 recorded probable NLEB calls on two and three nights, respectively; and station PW13 recorded probable NLEB calls on six nights (Table 4). Qualitative identification verified the presence of NLEB at stations PW9a (on a single night only) and PW13 (on six nights); however, qualitative analysis did not verify the presence of NLEB at the remaining seven stations with probable NLEB calls (Table 4).

DISCUSSIONS/CONCULSIONS

Limited information is available on NLEB migratory pathways and behaviors. While there is some information suggesting this species tends to follow forested areas and avoid open areas if possible, these bats may occasional move through non-forested areas.

The habitat assessment conducted by WEST at the Study Area provides information on potential NLEB habitat that might be found within the Study Area and nearby areas. If these bats occur in the area during the summer months, they will likely occur within or near (within

1,000 feet) of these habitat patches. Given its association with forest habitat (Henderson and Broders 2008; Foster and Kurta 1999), WEST anticipates that the larger and more contiguous blocks of forested areas would be more likely to be used by these species compared to the smaller forested blocks and/or tree lines and shelterbelts.

The NLEB was qualitatively verified as occurring at two acoustical stations surveyed within the Study Area (stations PW9a and PW13). Though not documented during this survey effort, there is potential for NLEB to be present within other suitable habitat within the Study Area during the summer months, particularly in the west/southwest portions of the Study Area, given the density and distribution of potential NLEB habitat; and the connectivity to larger forested and/or forested riparian habitats just outside of the Study Area boundary (i.e., forested/semi-forested corridors of Choteau Creek and Dry Choteau Creek and tributaries thereof).

Surveys are considered complete for all 20 stations at the Study Area and no further action is recommended to confirm NLEB presence within the current boundary (Table 5); however, acoustic data is probabilistic and presence determinations can be error prone. For a more detailed assessment of NLEB occurrence in the area, the USFWS guidelines (USFWS 2014a, 2015) recommend mist-netting in combination with radio-telemetry and emergence counts to confirm roost tree locations and roost size (Phase 3 and 4). Though the possibility exists for mist-netting results to contradict the acoustic results, it is unlikely for the USFWS to overturn acoustic evidence with mist-net evidence.

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Table 1. Location and site description of the 20 acoustic survey stations at the Prevailing Winds Study Area.

Station ID	Zone	Easting†	Northing†	Site Description
PW1	14	0569563	4776786	Edge of shelterbelts, adjacent to agricultural fields
PW2	14	0568133	4774899	Open woodlot adjacent to pasture
PW3	14	0568878	4775146	Edge of shrubby grove, adjacent to pond and pasture
PW4	14	0572800	4773535	Edge of shelterbelt and creek bed, adjacent to hay fields
PW5	14	0570321	4772303	Edge of small forest patch, adjacent to pasture
PW6	14	0579638	4770270	Edge of shelterbelt and grassy area, adjacent to pasture
PW6a	14	0574168	4770744	Grassy path adjacent to forest
PW7	14	0572985	4766554	Edge of forest in pasture
PW8	14	0575714	4766373	Edge of forest in grassy area, adjacent to pasture
PW8a	14	0575652	4768628	Grassy area adjacent to forest
PW9	14	0580064	4765600	Grassy path adjacent to forest edge and cornfield
PW9a	14	0569742	4766932	Pasture adjacent to forest edge
PW10	14	0578533	4763193	Grassy area adjacent to shelterbelt
PW11	14	0576700	4763072	Grassy area adjacent to forest edge and cropland
PW12	14	0575445	4762139	Grassy area adjacent to forest edge
PW13	14	0574443	4759581	Grassy/shrubby area adjacent to forest edges
PW14	14	0574925	4758670	Grassy/shrubby area adjacent to cedar/juniper
PW15	14	0575580	4758206	Grassy area adjacent to forest edge
PW16	14	0576680	4757714	Grassy area adjacent to forest edge
PW17	14	0578987	4756031	Grassy area adjacent to forest edge and cropland

Table 2. Number of bat calls recorded at each acoustic survey station determined by BCID for the Prevailing Winds Study Area.

Acoustic Survey Station	Total Bat Calls	Calls Identified	Detector Nights	Bat Calls/ Detector Night
PW1	248	241 (97%)	6	41.3
PW2	406	390 (96%)	6	67.7
PW3	104	100 (96%)	6	17.3
PW4	42	42 (100%)	6	7
PW5	137	135 (96%)	6	22.8
PW6a	1,309	1,296 (99%)	5	261.8
PW6	185	183 (99%)	9	20.6
PW7	379	372 (98%)	3	126.3
PW8	279	271 (97%)	5	55.8
PW8a	530	520 (98%)	4	132.5
PW9	325	320 (98%)	5	65
PW9a	203	194 (96%)	4	50.8
PW10	209	207 (99%)	5	41.8
PW11	458	450 (98%)	5	91.6
PW12	53	53 (100%)	3	17.7
PW13	699	674 (96%)	6	116.5
PW14	36	36 (100%)	6	6
PW15	29	28 (97%)	2	14.5
PW16	192	188 (98%)	6	32
PW17	655	623 (95%)	6	109.2
Total	**6,478**	**6,323 (98%)**	**104**	**62.3**

Table 3. Summary of BCID echolocation call identifications for the Prevailing Winds Study Area[1].

Station ID	EPFU	LABO	LACI	LANO	MYLU	MYSE	NYHU	PESU	UNK	Total
PW1	42	24	71	89	2	1	3	9	7	248
PW2	137	137	11	39	1	0	14	51	16	406
PW3	19	35	2	13	2	0	8	21	4	104
PW4	21	0	1	19	0	0	0	1	0	42
PW5	72	4	9	48	0	0	1	1	2	137
PW6	100	4	9	62	1	0	0	7	2	185
PW6a	626	176	22	425	1	1	29	16	13	1,309
PW7	234	36	6	60	25	0	4	7	7	379
PW8	40	181	0	2	5	0	36	7	8	279
PW8a	113	316	7	30	4	1	31	18	10	530
PW9	47	14	35	213	0	0	4	7	5	325
PW9a	51	55	9	32	4	5	5	33	9	203
PW10	97	10	16	76	2	0	0	6	2	209
PW11	115	59	48	182	2	1	3	40	8	458
PW12	24	7	0	16	0	0	1	5	0	53
PW13	123	223	8	56	15	195	28	26	25	699
PW14	14	3	1	16	0	2	0	0	0	36
PW15	16	0	1	8	0	0	2	1	1	29
PW16	45	63	2	32	9	1	14	22	4	192
PW17	138	218	3	62	8	3	17	174	32	655

[1] EPFU = Big Brown Bat; LABO = Eastern Red Bat; LACI = Hoary Bat; LANO = Silver-haired Bat; MYLU = Little Brown Bat; MYSE = Northern Long-eared Bat; NYHU = Evening Bat; PESU = Tri-colored bat; UNK = Unknown

Table 4. Summary of Myotis call identifications by BCID and qualitative analysis[1] for stations with potential Northern long-eared bat calls at the Prevailing Winds Study Area.

Station ID	Date	Identification Method	MYSE (NLEB)
PW1	July 24	BCID	1
		Qualitative	0
PW6a	July 31	BCID	1
		Qualitative	0
PW8a	July 30	BCID	1
		Qualitative	0
PW9a	August 9	BCID	1
		Qualitative	0

Table 4. Summary of Myotis call identifications by BCID and qualitative analysis[1] for stations with potential Northern long-eared bat calls at the Prevailing Winds Study Area.

Station ID	Date	Identification Method	MYSE (NLEB)
PW9a	August 10	BCID	4
		Qualitative	1
PW11	July 29	BCID	1
		Qualitative	0
PW13	August 1	BCID	39
		Qualitative	25
PW13	August 2	BCID	41
		Qualitative	21
PW13	August 3	BCID	33
		Qualitative	23
PW13	August 4	BCID	29
		Qualitative	19
PW13	August 5	BCID	19
		Qualitative	9
PW13	August 6	BCID	34
		Qualitative	16
PW14	August 1	BCID	2
		Qualitative	0
PW16	August 1	BCID	1
		Qualitative	0
PW17	August 1	BCID	1
		Qualitative	0
PW17	August 4	BCID	1
		Qualitative	0
PW17	August 5	BCID	1
		Qualitative	0

[1] Only calls with p-values < 0.05 for the maximum-likelihood estimation were included in qualitative analysis (USFWS 2014a).

Table 5. Summary of actions at each acoustic survey site for the Prevailing Winds Study Area.

Station ID	BCID NLEB Calls	Probable NLEB Calls (P < 0.05)	NLEB Qualitatively Verified	Presence/Absence Determination
PW1	Yes	Yes	No	NLEB absent
PW2	No	No	No	NLEB absent
PW3	No	No	No	NLEB absent
PW4	No	No	No	NLEB absent
PW5	No	No	No	NLEB absent
PW6	No	No	No	NLEB absent
PW6a	Yes	Yes	No	NLEB absent
PW7	No	No	No	NLEB absent
PW8	No	No	No	NLEB absent
PW8a	Yes	Yes	No	NLEB absent
PW9	No	No	No	NLEB absent
PW9a	Yes	Yes	Yes	NLEB present
PW10	No	No	No	NLEB absent
PW11	Yes	Yes	No	NLEB absent
PW12	No	No	No	NLEB absent
PW13	Yes	Yes	Yes	NLEB present
PW14	Yes	Yes	No	NLEB absent
PW15	No	No	No	NLEB absent
PW16	Yes	Yes	No	NLEB absent
PW17	Yes	Yes	No	NLEB absent

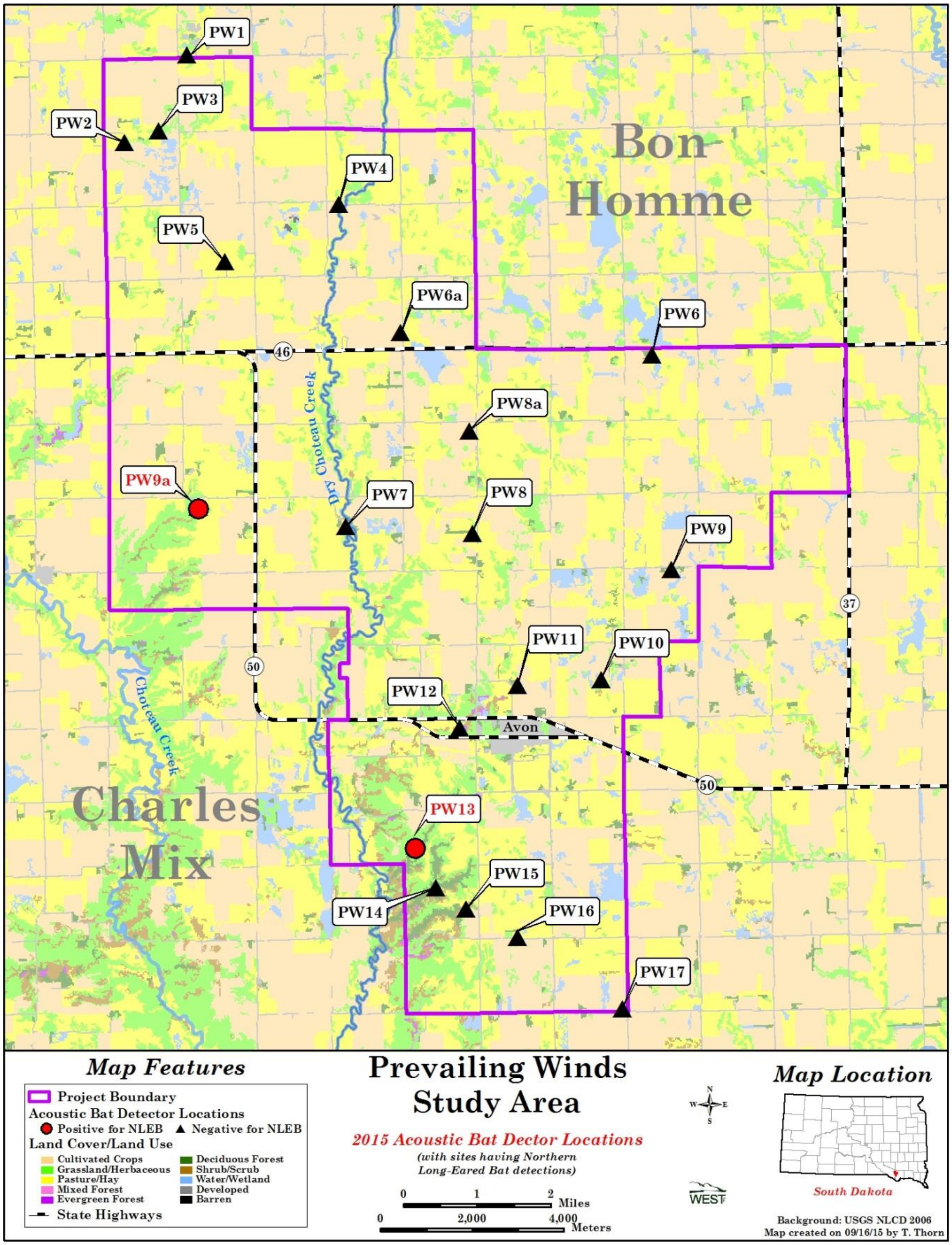


Figure 1. Locations of acoustic bat detectors and those confirmed positive for NLEB at the Prevailing Winds Study Area from July 21 through August 10, 2015.

Appendix A. Pictures of Acoustic Survey Sites

Photo 1. Bat habitat surveyed by AnaBat detector at station PW1.

Photo 2. Bat habitat surveyed by AnaBat detector at site PW2.

Photo 3. Bat habitat surveyed by AnaBat detector at station PW3.

Photo 4. Bat habitat surveyed by AnaBat detector at site PW4.

Photo 5. Bat habitat surveyed by AnaBat detector at station PW5.

Photo 6 . Bat habitat surveyed by AnaBat detector at site PW6.

Photo 7. Bat habitat surveyed by AnaBat detector at station PW6a.

Photo 8. Bat habitat surveyed by AnaBat detector at site PW7.

Photo 9. Bat habitat surveyed by AnaBat detector at station PW8.

Photo 10. Bat habitat surveyed by AnaBat detector at site PW8a.

Photo 11. Bat habitat surveyed by AnaBat detector at station PW9.

Photo 12. Bat habitat surveyed by AnaBat detector at site PW9a.

Photo 13. Bat habitat surveyed by AnaBat detector at station PW10.

Photo 14. Bat habitat surveyed by AnaBat detector at site PW11.

Photo 15. Bat habitat surveyed by AnaBat detector at station PW12.

Photo 16. Bat habitat surveyed by AnaBat detector at site PW13.

Photo 17. Bat habitat surveyed by AnaBat detector at station PW14.

Photo 18. Bat habitat surveyed by AnaBat detector at site PW15.

Photo 19. Bat habitat surveyed by AnaBat detector at station PW16.

Photo 20. Bat habitat surveyed by AnaBat detector at site PW17.

Appendix B. Datasheets from Acoustic Survey Sites

Acoustic Monitoring STATION

2011 Data Form

Station #: PW-1

Observer: RS

Date: 7-21-15

Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0569503 Northing: 4776786

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 80814 *(microphone)*

_______________ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 1.5
(Height from ground to detector/microphone)

Aspect: E
(Bearing or Cardinal Direction of mic)

Power Supply: 12V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe		Deciduous Forest		Grassland		Other (describe)	
Crop/Agriculture	1	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

Topography: Flat Slope High Point Low Point Other: ____________

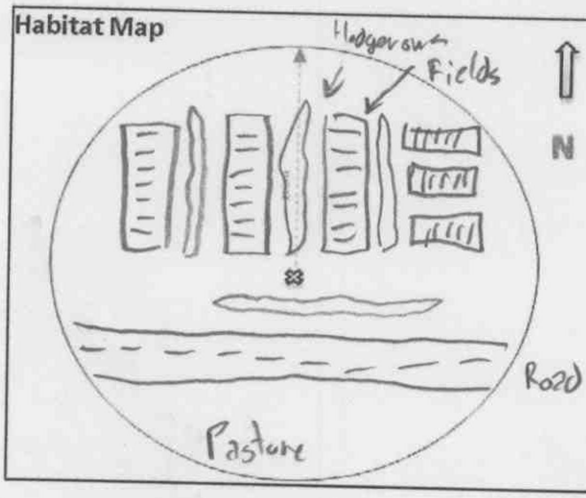
Was this station chosen to sample a bat feature? Yes No

N, E, S, W, Unit, Cone

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ____________

Habitat Map



Codes	Bat Features	Description
AS=	anthropogenic structure	:
CV=	cave	:
MN=	mine	:
RO=	rocky outcrop	:
CF=	coniferous forest stand	:
DF=	deciduous forest stand	:
WA=	water	:
Other=:		

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION 2011 Data Form Station #: PW-2

Observer: RS Date: 7-21-15 Project: Prevailing Wind

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0568133 Northing: 4774899

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. Serial Number(s): 80966 *(microphone)*

_______ *(recorder, if applicable)*

Placement: Ground Raised Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2m Aspect: E Power Supply: 12V

(Height from ground to detector/microphone) *(Bearing or Cardinal Direction of mic)* *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe	2	Deciduous Forest		Grassland		Other (describe)	3
Crop/Agriculture	1	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

- Pasture

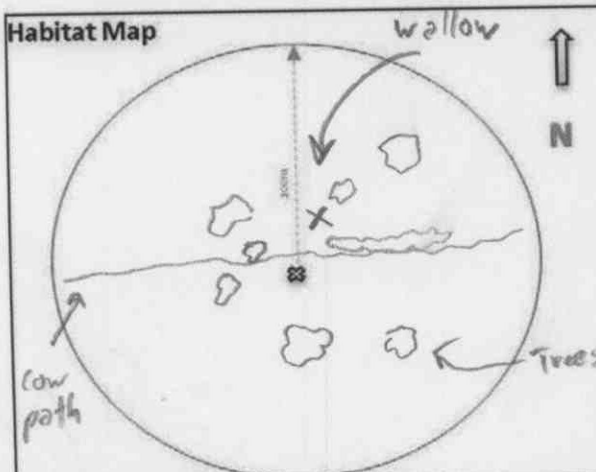
Topography: Flat Slope High Point Low Point Other:_______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: N, E, S, W, Unit, Cone

Habitat Map



Codes Bat Features | Description

AS=anthropogenic structure :

CV=cave :

MN=mine :

RO=rocky outcrop :

CF=coniferous forest stand :

DF=deciduous forest stand :

WA=water :

Other=:

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION

2011 Data Form

Station #: Pw-3

Observer: RS

Date: 7-21-15

Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0568878 Northing: 4775146

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 03697 *(microphone)*

_______ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2 m *(Height from ground to detector/microphone)*

Aspect: NE *(Bearing or Cardinal Direction of mic)*

Power Supply: 12V *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe	2	Deciduous Forest		Grassland		Other (describe)	1
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland	3	Pinyon-Juniper		Water (lake, etc.)			

Pasture

Topography: Flat Slope High Point Low Point Other:

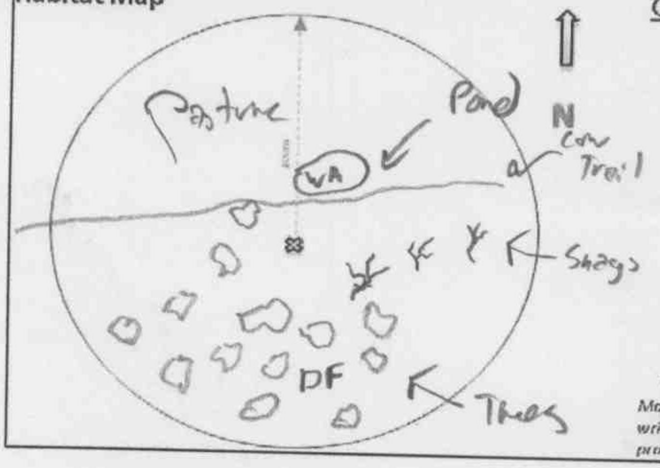
Was this station chosen to sample a bat feature? Yes No

N, E, S, W, unit, Cone

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks:

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:
Other=:	

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION

2011 Data Form

Observer: RS

Date: 7-21-15

Station #: PW-4

Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0572800 Northing: 4773535

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 03483 *(microphone)*

________ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: E
(Bearing or Cardinal Direction of mic)

Power Supply: 12V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe	1	Deciduous Forest		Grassland		Other (describe)	
Crop/Agriculture	2	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

2 Hay Field

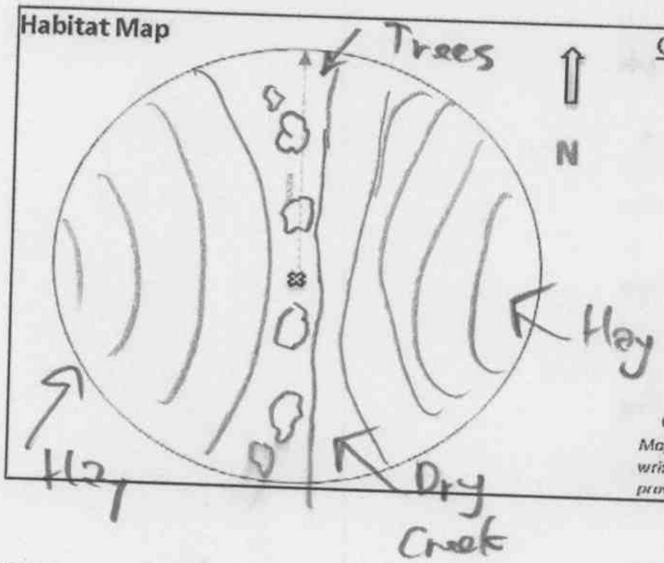
Topography: Flat Slope High Point Low Point Other:________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.* N, E, S, W, Unit, Core

General Remarks: ________

Habitat Map



Codes	Bat Features	Description
AS=	anthropogenic structure	:
CV=	cave	:
MN=	mine	:
RO=	rocky outcrop	:
CF=	coniferous forest stand	:
DF=	deciduous forest stand	:
WA=	water	:
Other=:		

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: PW-5

Observer: RS | Date: 7-21-15 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0570321 Northing: 4772303

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. | Serial Number(s): 80917 *(microphone)* ______ *(recorder, if applicable)*

Placement: Ground Raised | Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary | Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No | Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2 *(Height from ground to detector/microphone)* | Aspect: E *(Bearing or Cardinal Direction of mic)* | Power Supply: 12V *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe	1	Deciduous Forest	3	Grassland		Other (describe)	2 Pasture
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

Topography: Flat Slope High Point Low Point Other: ______

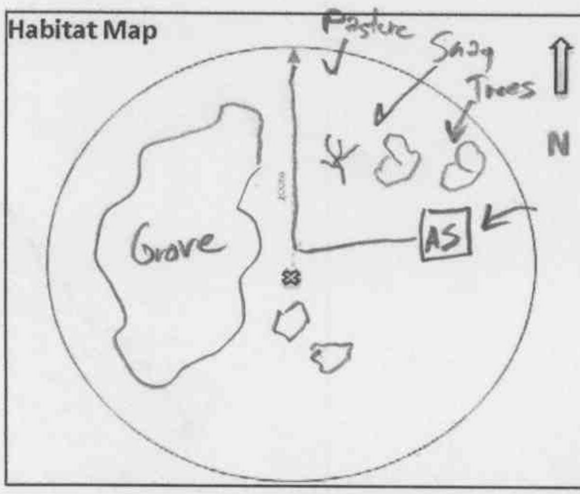
Was this station chosen to sample a bat feature? Yes No

N, E, S, W, unit, cone

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ______

Habitat Map



Codes	Bat Features	Description
AS=anthropogenic structure		:
CV=cave		:
MN=mine		:
RO=rocky outcrop		:
CF=coniferous forest stand		:
DF=deciduous forest stand		:
WA=water		:
Other=:		

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION

2011 Data Form

Station #: PW-6

Observer: RS

Date: 7-21-15

Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0579638 Northing: 4770270

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 80482 *(microphone)*

_______ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: NE
(Bearing or Cardinal Direction of mic)

Power Supply: 12V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe	1	Deciduous Forest		Grassland		Other (describe)	2 Pasture
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

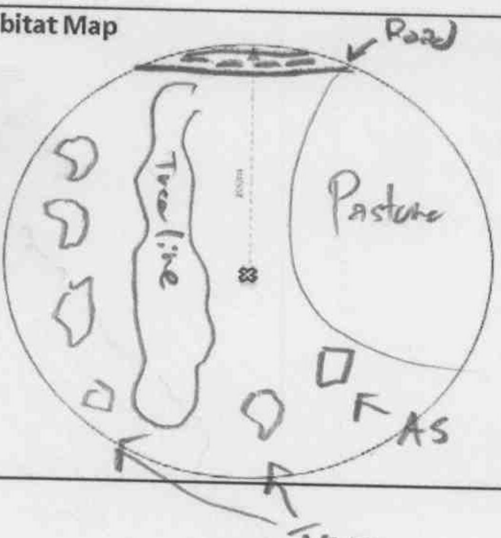
Topography: Flat Slope High Point Low Point Other:_______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.* N, E, S, W, Unit, Cone

General Remarks: _______

Habitat Map



N

Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:
Other=:	

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION **2011 Data Form** **Station #:** PW-6A

Observer: Ryan McDonald **Date:** 7/28/2015 **Project:** Prevailing Winds

Station Information

Datum: NAD27 or NAD83 **Zone:** 14 T **Easting:** 574168 **Northing:** 4770744

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. **Serial Number(s):** 80966 *(microphone)*
______ *(recorder, if applicable)*

Placement: Ground Raised **Raised System:** N/A Pulley Fixed

Station Type: Fixed Temporary **Microphone Protection:** Plastic Bin Bat Hat None

Met Tower Present? Yes No **Sound Reception:** PVC Elbow Reflector Plate None

Microphone Ht (m): 2 *(Height from ground to detector/microphone)* **Aspect:** 350° *(Bearing or Cardinal Direction of mic)* **Power Supply:** 12V *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	1	Grassland	2	Other (describe)	4
Crop/Agriculture	3	Coniferous Forest		Desert		road	
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

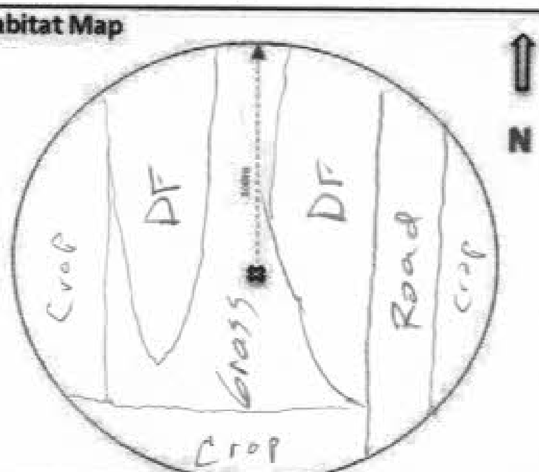
Topography: Flat Slope High Point Low Point Other: ______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: grassy road leads directly to point

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	: mature
WA=water	:
Other=	

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION

2011 Data Form

Observer: RS

Date: 7-21-15

Station #: PW-7

Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0572985 Northing: 4766554

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 015567 (microphone)

_______________ (recorder, if applicable)

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: NE
(Bearing or Cardinal Direction of mic)

Power Supply: 6V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe		Deciduous Forest	1	Grassland		Other (describe)	2 Pasture
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

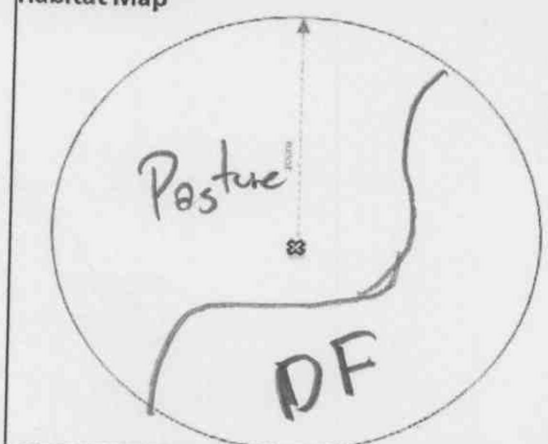
Topography: Flat Slope High Point Low Point Other: _______________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). **Label** and mail to your bat liaison on your thumb drive.* N, E, S, W, Unit, Cone

General Remarks: _______________

Habitat Map



N

Codes **Bat Features** | **Description**

AS=anthropogenic structure :
CV=cave :
MN=mine :
RO=rocky outcrop :
CF=coniferous forest stand :
DF=deciduous forest stand :
WA=water :
Other=:

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION — 2011 Data Form

Observer: RS — Date: 7-21-15 — Station #: PW-8 — Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 Easting: 0575714 Northing: 4766373

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 015653 *(microphone)*

_______________ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: E
(Bearing or Cardinal Direction of mic)

Power Supply: 6V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe	1	Deciduous Forest	2	Grassland	3	Other (describe)	
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

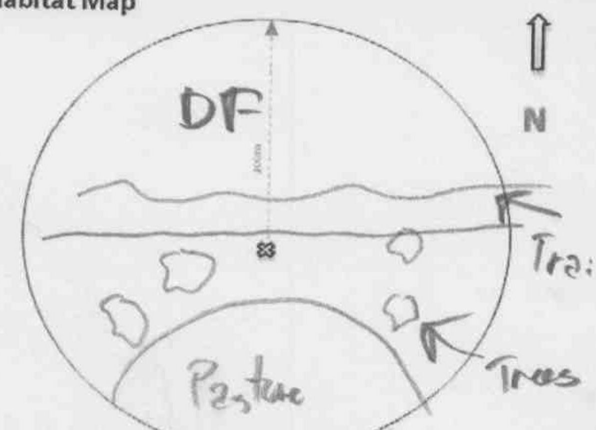
Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.* N, E, S, W, Unit, Cone

General Remarks:

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:
Other=:	

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: PW 8 A

Observer: Ryan McDonald | Date: 7/28/2015 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 575652 Northing: 4768628

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 80917 *(microphone)*

_______________ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: 120
(Bearing or Cardinal Direction of mic)

Power Supply: 12V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe		Deciduous Forest	1	Grassland	2	Other (describe)	
Crop/Agriculture	3	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

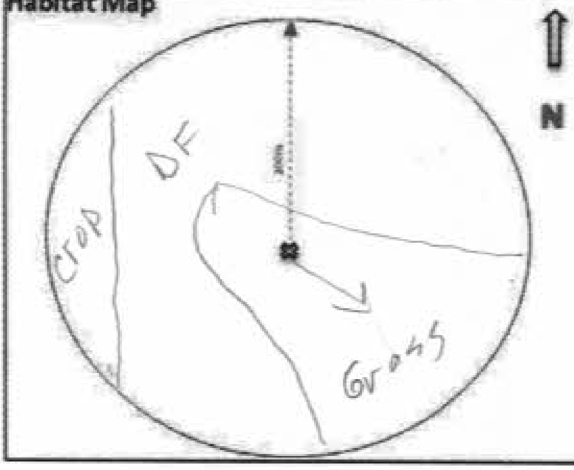
Topography: Flat Slope High Point Low Point Other: _______________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: follow driveway to point

Habitat Map



Codes	Bat Features	Description
AS=	anthropogenic structure	:
CV=	cave	:
MN=	mine	:
RO=	rocky outcrop	:
CF=	coniferous forest stand	:
DF=	deciduous forest stand	:
WA=	water	:
Other=	:	

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: PW-9

Observer: Ryan McDonald | Date: 7/27/2015 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 580064 Northing: 4765600

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 03483 *(microphone)*

______ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: 270°
(Bearing or Cardinal Direction of mic)

Power Supply: 12 V battery
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	2	Grassland	4	Other (describe)	
Crop/Agriculture	1	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper	3	Water (lake, etc.)			

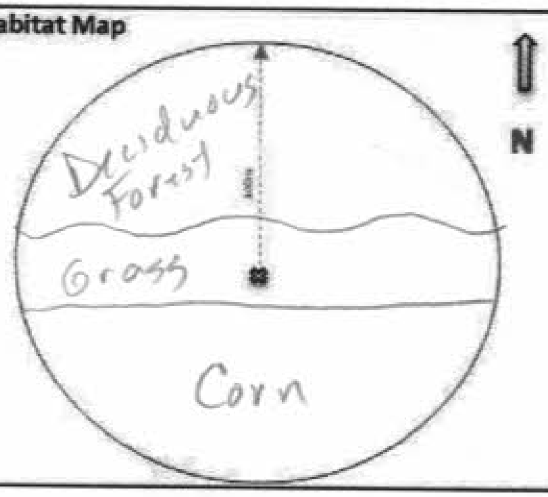
Topography: Flat Slope High Point Low Point Other: ______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ______

Habitat Map



Codes	Bat Features	Description
AS=anthropogenic structure		:
CV=cave		:
MN=mine		:
RO=rocky outcrop		:
CF=coniferous forest stand		: mature
DF=deciduous forest stand		: mature
WA=water		:
Other=:		

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: PW 9A

Observer: Ryan McDonald | Date: 8/7/2015 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14T Easting: 569742 Northing: 4766932

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. | Serial Number(s): 80917 (microphone)

_______________ (recorder, if applicable)

Placement: Ground Raised | Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary | Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No | Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 1.5 (Height from ground to detector/microphone) | Aspect: 80° (Bearing or Cardinal Direction of mic) | Power Supply: 12 V (e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	2	Grassland	1	Other (describe)	
Crop/Agriculture		Coniferous Forest	3	Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)	4		

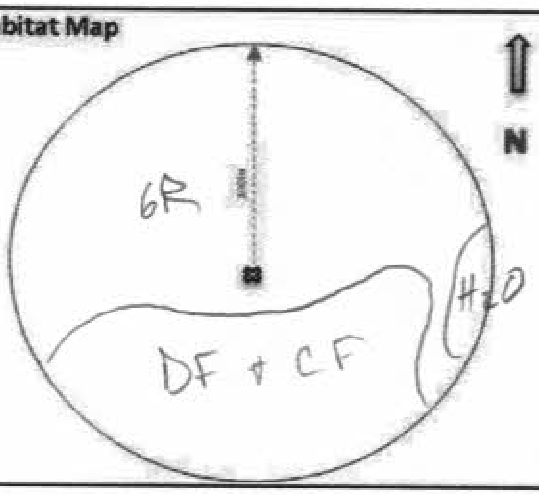
Topography: Flat Slope High Point Low Point Other: ____________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ____________

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:
Other=:	

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION **2011 Data Form** **Station #:** PW10

Observer: Ryan McDonald **Date:** 7/27/2015 **Project:** Prevailing Winds

Station Information

Datum: NAD27 or NAD83 **Zone:** 14T **Easting:** 578533 **Northing:** 4763193

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. **Serial Number(s):** 80814 *(microphone)*

______ *(recorder, if applicable)*

Placement: Ground Raised **Raised System:** N/A Pulley Fixed

Station Type: Fixed Temporary **Microphone Protection:** Plastic Bin Bat Hat None

Met Tower Present? Yes No **Sound Reception:** PVC Elbow Reflector Plate None

Microphone Ht (m): 2 *(Height from ground to detector/microphone)* **Aspect:** 15° *(Bearing or Cardinal Direction of mic)* **Power Supply:** 12 V *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	2	Grassland	1	Other (describe)	
Crop/Agriculture	3	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

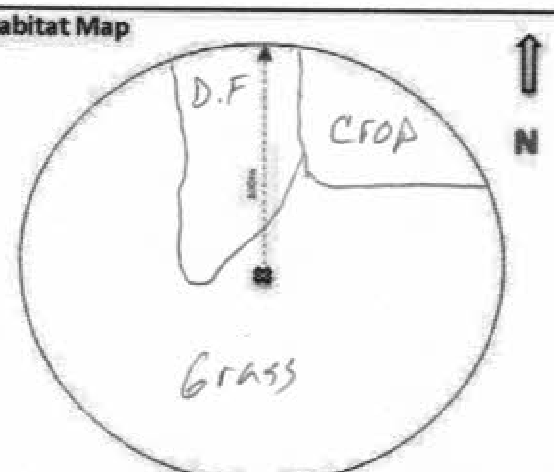
Topography: Flat Slope High Point Low Point Other: ______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ______

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	: mature
WA=water	:
Other=:	

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION **2011 Data Form** **Station #:** DW-11

Observer: Ryan McDonald **Date:** 7/27/2015 **Project:** Prevailing Winds

Station Information

Datum: NAD27 or NAD83 **Zone:** 14T **Easting:** 576700 **Northing:** 4763072

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 03697 *(microphone)*

________ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: 5°
(Bearing or Cardinal Direction of mic)

Power Supply: 12 V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	1	Grassland	3	Other (describe)	
Crop/Agriculture	2	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

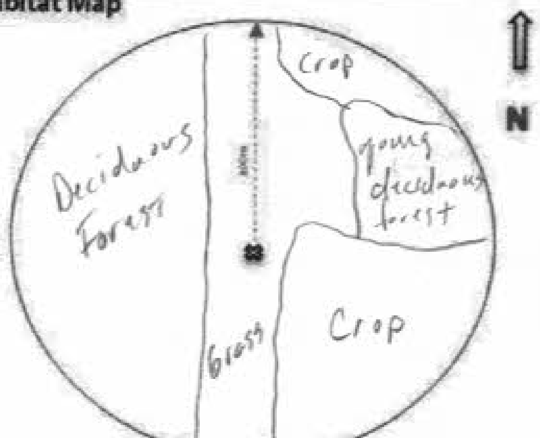
Topography: Flat Slope High Point Low Point Other: ________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ________

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:

Other=: ________

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, mud, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION 2011 Data Form Station #: PW 12

Observer: Ryan McDonald Date: 7/28/2015 Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 575445 Northing: 4762139

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. Serial Number(s): 80482 (microphone)

_____ (recorder, if applicable)

Placement: Ground Raised Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: 200°
(Bearing or Cardinal Direction of mic)

Power Supply: 12 ✓
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	2	Grassland	1	Other (describe)	
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

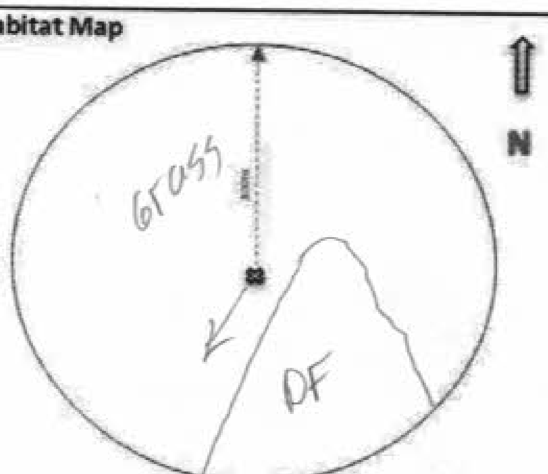
Topography: Flat Slope High Point Low Point Other: _____

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: _____

Habitat Map



Codes	Bat Features	Description
AS=	anthropogenic structure	:
CV=	cave	:
MN=	mine	:
RO=	rocky outcrop	:
CF=	coniferous forest stand	:
DF=	deciduous forest stand	:
WA=	water	:

Other: _____

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION 2011 Data Form Station #: PW 13

Observer: Ryan McDonald Date: 8/1/2015 Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 574443 Northing: 4759581

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. Serial Number(s): 03483 (microphone)

(recorder, if applicable)

Placement: Ground Raised Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 1.5 Aspect: 90 Power Supply: 12 V

(Height from ground to detector/microphone) *(Bearing or Cardinal Direction of mic)* *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	1	Grassland	2	Other (describe)	
Crop/Agriculture		Coniferous Forest	3	Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

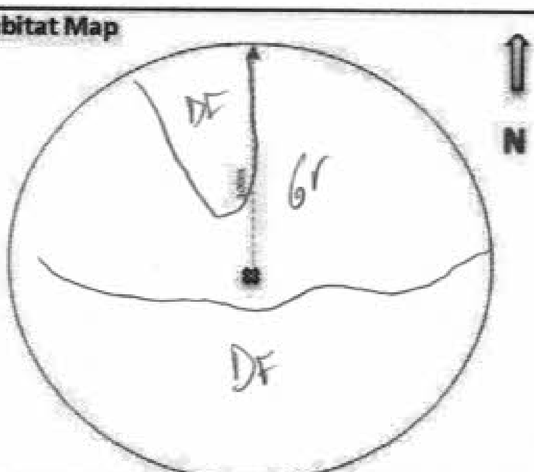
Topography: Flat Slope High Point Low Point Other:

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks:

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:

Other=:

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION 2011 Data Form Station #: PW-14

Observer: Ryan McDonald Date: 8/1/2015 Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14T Easting: 574925 Northing: 4758670

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T.

Serial Number(s): 03697 *(microphone)*

________ *(recorder, if applicable)*

Placement: Ground Raised

Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary

Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No

Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: 30
(Bearing or Cardinal Direction of mic)

Power Supply: 12 V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe	3	Deciduous Forest	2	Grassland	4	Other (describe)	
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper	1	Water (lake, etc.)			

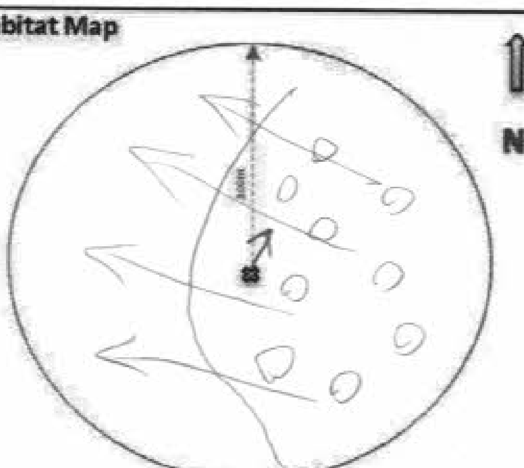
Topography: Flat Slope High Point Low Point Other: ________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ________

Habitat Map



N

Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:

Other=: ________

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: PW-15

Observer: Ryan McDonald | Date: 8/1/2015 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 575580 Northing: 4758206

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. | Serial Number(s): 80966 (microphone)

______ (recorder, if applicable)

Placement: Ground Raised | Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary | Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No | Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 1.5 *(Height from ground to detector/microphone)* | Aspect: 0° *(Bearing or Cardinal Direction of mic)* | Power Supply: 12 V *(e.g., voltage and Amp-hours of battery, solar panel, etc.)*

Habitat Information

Habitat: *Rank by abundance within 100 m of detector. 1 = most abundant, etc.*

Shrub/Steppe		Deciduous Forest	2	Grassland	1	Other (describe)	
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)	3		

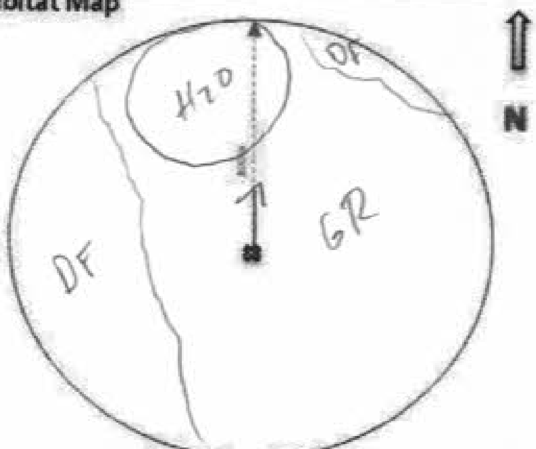
Topography: Flat Slope High Point Low Point Other: ______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: ______

Habitat Map



Codes	Bat Features	Description
AS=anthropogenic structure		:
CV=cave		:
MN=mine		:
RO=rocky outcrop		:
CF=coniferous forest stand		:
DF=deciduous forest stand		:
WA=water		:

Other=: ______

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: PW 16

Observer: Ryan McDonald | Date: 8/1/2015 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 576680 Northing: 4757714

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. | Serial Number(s): 80482 (microphone)

_______________ (recorder, if applicable)

Placement: Ground Raised | Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary | Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No | Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 2
(Height from ground to detector/microphone)

Aspect: 0
(Bearing or Cardinal Direction of mic)

Power Supply: 12 V
(e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat:
Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe		Deciduous Forest	2	Grassland	1	Other (describe)	
Crop/Agriculture		Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

Topography: Flat Slope High Point Low Point Other: _______________

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: _______________

Habitat Map

N

Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:

Other=: _______________

Map out bat and habitat features within 100 m radius of detector (s). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

Acoustic Monitoring STATION | 2011 Data Form | Station #: DW-17

Observer: Ryan McDonald | Date: 8/1/2015 | Project: Prevailing Winds

Station Information

Datum: NAD27 or NAD83 Zone: 14 T Easting: 578987 Northing: 4756031

Detector Type: SD2 SD1 Anabat II SM2 Pettersson B.A.T. | Serial Number(s): 80917 (microphone) ______ (recorder, if applicable)

Placement: Ground Raised | Raised System: N/A Pulley Fixed

Station Type: Fixed Temporary | Microphone Protection: Plastic Bin Bat Hat None

Met Tower Present? Yes No | Sound Reception: PVC Elbow Reflector Plate None

Microphone Ht (m): 1.5 (Height from ground to detector/microphone) | Aspect: 280° (Bearing or Cardinal Direction of mic) | Power Supply: 12 V (e.g., voltage and Amp-hours of battery, solar panel, etc.)

Habitat Information

Habitat: Rank by abundance within 100 m of detector. 1 = most abundant, etc.

Shrub/Steppe		Deciduous Forest	1	Grassland	2	Other (describe)	
Crop/Agriculture	3	Coniferous Forest		Desert			
Riparian/Wetland		Pinyon-Juniper		Water (lake, etc.)			

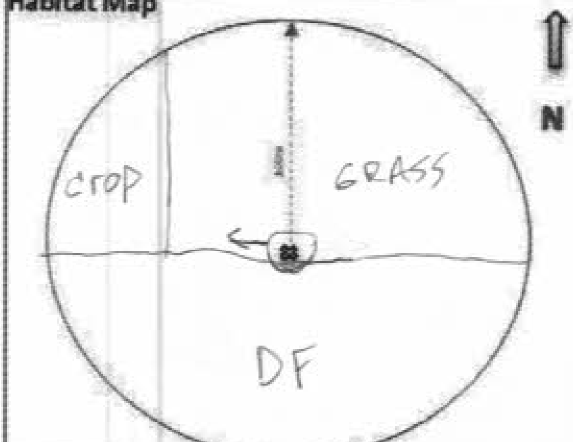
Topography: Flat Slope High Point Low Point Other: ______

Was this station chosen to sample a bat feature? Yes No

Photos: *Take photos of the area from each cardinal direction (facing away from the detector), as well as from the direction the microphone is pointing, and one of the detector set-up itself. Also take photos of any bat features present and anything else of interest (e.g., sage grouse pellets, etc.). Label and mail to your bat liaison on your thumb drive.*

General Remarks: There

Habitat Map



Codes Bat Features	Description
AS=anthropogenic structure	:
CV=cave	:
MN=mine	:
RO=rocky outcrop	:
CF=coniferous forest stand	:
DF=deciduous forest stand	:
WA=water	:

Others: ______

Map out bat and habitat features within 100 m radius of detector (x). Label using codes provided, and write in any other features of interest (cliff, road, etc.). Provide descriptions for bat features in spaces provided.

APPENDIX J - NORTHERN LONG-EARED BAT PRESENCE/ABSENCE SURVEY

ENVIRONMENTAL & STATISTICAL CONSULTANTS
4007 State Street, Suite 109, Bismarck, ND 58503
Phone: 701-250-1756 ◆ www.west-inc.com ◆ Fax: 701-250-1761

February 12, 2018

Bridget Canty
Prevailing Winds, LLC.

RE: Prevailing Winds Project
Northern Long-eared Bat 2016 Summer Presence/Absence Survey

Dear Ms. Canty,

Prevailing Winds, LLC, (Prevailing Winds) requested that Western EcoSystems Technology, Inc. (WEST) implement the USFWS 2016 Northern Long-eared Bat Survey[1] guidance to determine the presence/absence of the proposed northern long-eared bat (*Myotis septentrionalis*) within the Prevailing Winds Wind Project (the Project). Based on the Project boundary, as provided by Prevailing Winds before the 2016 survey, there were approximately 440 acres of wooded habitat within the Project boundary. The USFWS 2016 guidelines call for a minimum of two sample locations each sampled for two nights (total of four acoustic detector nights) for each 123 acres of woodlands. Based on the amount of wooded habitat, the guidelines required that 8 locations (see attached figure) be surveyed for 2 nights each, for a total of 16 detector nights.

A combination eight Anabat SD1 and SD2 detectors, with microphones elevated to 10 feet, were placed in habitat that would likely attract bats commuting between roosting and foraging areas (e.g., along forest edges and along forest corridors) in adherence with the USFWS 2016 guidelines. Detectors were deployed from July 12 until August 4, during which adequate nighttime sample conditions of low wind (below 9 mph), mild temperatures (above 50^{o}F), and lack of sustained precipitation (less than 1 hour) occurred on a minimum of two nights based on local weather stations. Other nights had elevated winds or sustained periods of rain. Regardless, call data from all nights from all detectors were analyzed.

Echolocation call analysis followed the acoustic survey guidelines issued by the USFWS which involves a combination of automated species identification software and qualitative review by an acoustic expert. Echolocation call data were reviewed using Kaleidoscope version 4.0.0, one of the candidate acoustic identification programs recommended by USFWS[2]. We selected the

[1] US Fish and Wildlife Service (USFWS). 2016. Range-wide Indiana Bat Summer Survey Guidelines (April 2016). Available: https://www.fws.gov/midwest/endangered/mammals/inba/inbasummersurveyguidance.html

[2] http://www.fws.gov/midwest/endangered/mammals/inba/surveys/inbaAcousticSoftware.html

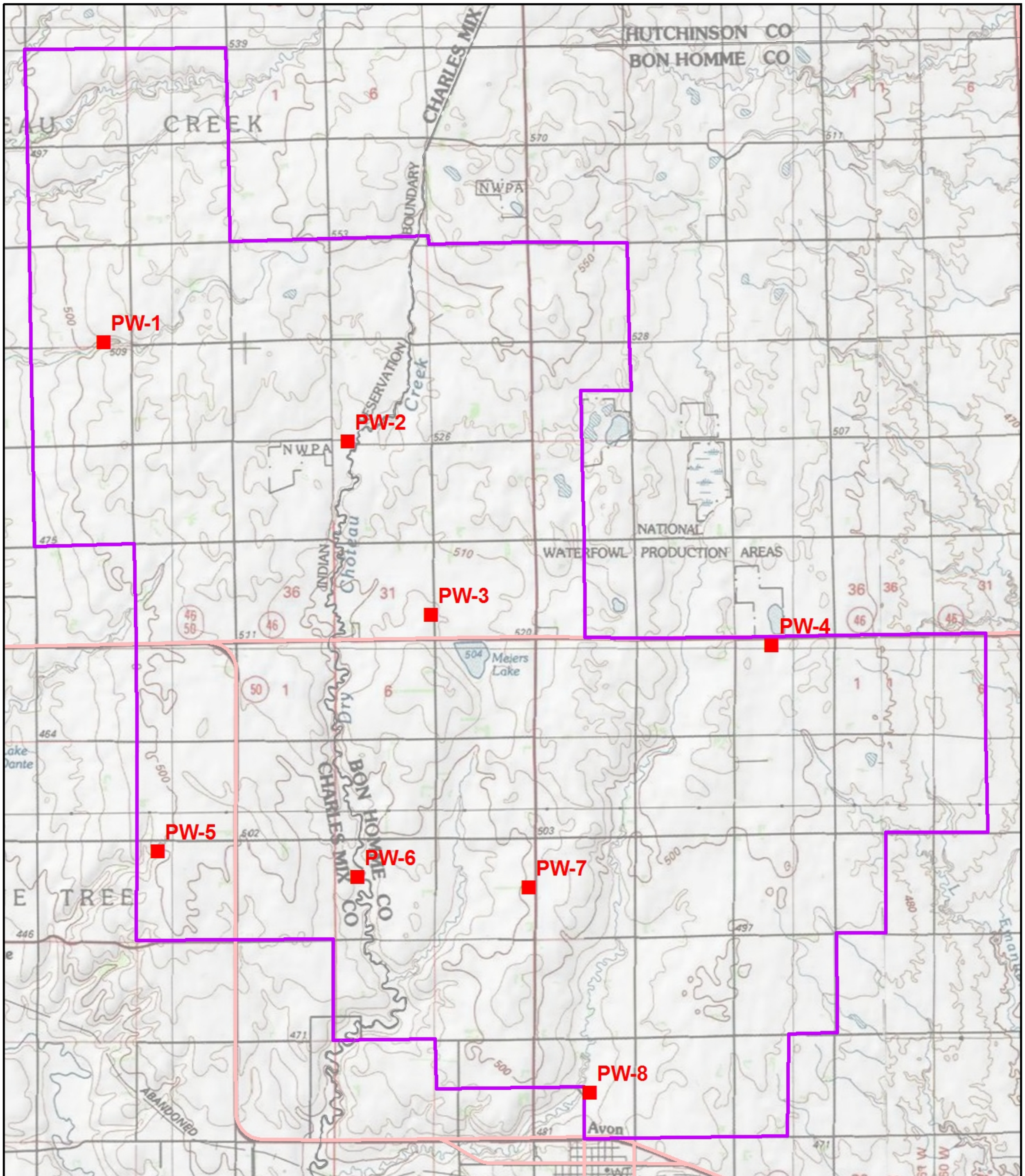
South Dakota subset of 7 species, as well as the northern long-eared bat, from the Bats of North America 3.1.0 classifier, and used the recommended sensitivity setting of -1 (Liberal). Kaleidoscope probabilistically identifies echolocation calls to species based on statistical comparison of the unknown calls to known calls. If the program identified potential northern long-eared bat calls, or identified a night that northern long-eared bats were likely present (Presence p-value > 0.05), then qualitative identification was performed to determine if calls were likely to have been produced by northern long-eared bats or other species. All calls that were identified as northern long-eared bat were reviewed by Jeff Gruver (WEST, Inc.), a recognized bat acoustic expert, per USFWS guidelines. Qualitative review was based on Mr. Gruver's extensive experience with bat acoustics, and relied primarily on comparison of calls recorded at the site to known calls from northern long-eared and other species (e.g., little brown bats) that can produce calls similar to northern long-eared bats.

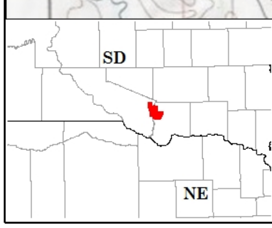
No northern long-eared bat calls were recorded at any station during the sampling period, indicating probable absence within the area.

Please let me know if you have any questions or need further information.

Sincerely,

Clayton Derby
Senior Manager





Prevailing Winds Wind Project

Anabat Locations 2016

Data Source: ESRI USA Topo Maps
Coordinate System: UTM, NAD83, zn 14N
Map produced on 06/29/2016 by T. Thorn

0 1 2 mi
0 1 2 km

Map Features

Project Boundary

Potential Anabat Locations

N W E S

WEST

APPENDIX K - WHOOPING CRANE HABITAT REVIEW

Whooping Crane Habitat Review
Prevailing Winds Wind Project
Bon Homme and Charles Mix Counties, South Dakota

Prepared for:

Prevailing Winds, LLC
101 Second Street West
P.O. Box 321
Chokio, Minnesota 56221

Prepared by:

Clayton Derby
Western EcoSystems Technology, Inc.
4007 State Street, Suite 109
Bismarck, ND 58503

August, 2016

NATURAL RESOURCES ◆ SCIENTIFIC SOLUTIONS

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INTRODUCTION

The Prevailing Winds Wind Project (PWWP) is proposed for development by Prevailing Winds Wind Project LLC (Prevailing Winds) in Bon Homme and Charles Mix Counties, South Dakota. Prevailing Winds requested that Western EcoSystems Technology, Inc. (WEST) implement a desktop review and analysis of potential whooping crane (*Grus americana*) habitat resources within the PWWP and to compare these resources to areas outside of the project boundary to the north, south, east, and west. The habitat review and analysis evaluates whether or not the proposed PWWP area represents the only unique whooping crane habitat compare to the surrounding landscape. From this analysis all parties can then discuss what impacts there may be to whooping cranes from development of the PWWP.

PROJECT AREA

The PWWP is located in the southeastern South Dakota counties of Bon Homme and Charles Mix, just north of the city of Avon (Figure 1). The PWWP is currently about 37,017 acres (ac; 150 square kilometers [km^2]; 58 square miles [mi^2]). Landscape within the project area is generally flat with some steeper hills. Elevations range from 454.5 to 573.7 meters (m; 1,491.2 to 1,882.3 feet [ft]) above sea level. Historically, the PWWP's landscape was dominated by grasslands but has since been converted largely to agricultural use with crop production and livestock grazing the primary practices. Trees and shrubs can be found around farmsteads, within planted shelter belts, and along/within drainages. Wetlands are scattered throughout the PWWP with some being man-made. Common agricultural crops include small grains, corn, soybeans, and alfalfa.

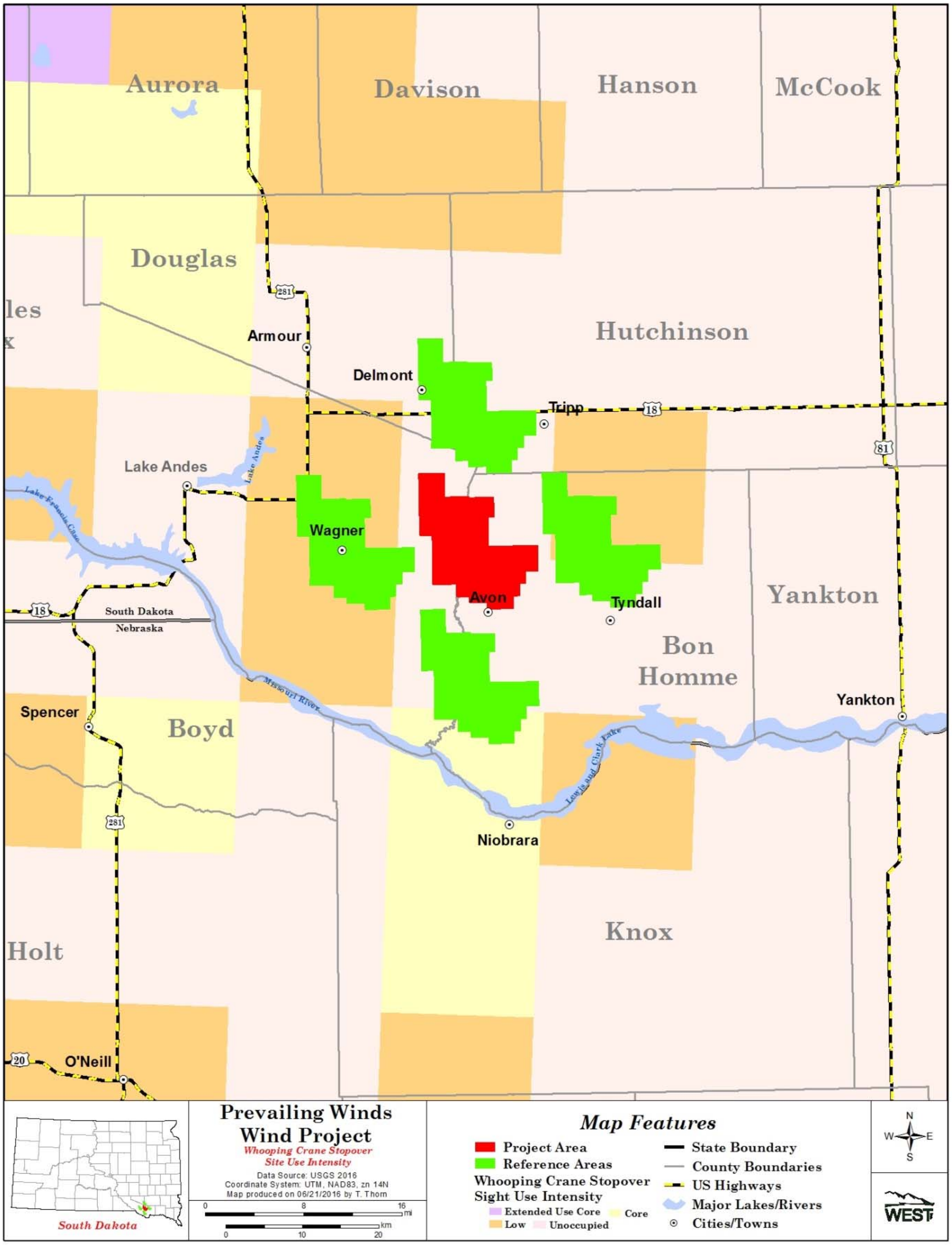

Figure 1. Location of the Prevailing Winds Wind Project, alternate areas, and whooping crane stopover site use intensity.

METHODS

A desktop review was completed using ArcGIS, ArcMap 10.3, land cover information from the National Land Cover Database (NLCD), wetland data from the National Wetland Inventory (NWI), 2014 National Agricultural Imagery Program (NAIP) aerial imagery, and the current project boundary as provided by Prevailing Winds. A site visit was not completed by WEST for this exercise specifically, but WEST has conducted other surveys at the PWWP and confirmed that the mapping generally agrees with current conditions.

The whooping crane habitat analysis included a comparison of land cover within the proposed PWWP boundary and four alternate areas of the same dimensions located adjacent (based on the PWWP's boundary extent) to the PWWP boundary in the four cardinal directions (Figure 1). A potentially suitable habitat assessment (Watershed Institute 2012) was also used to quantify and compare whooping crane habitat within the study areas. This assessment first screens all wetlands within the study areas for minimum size, visual obstructions, and disturbances. Those wetlands left are then quantified by their size, density of wetlands around them, distance to food, whether they are natural or man-made, and their water regime as a means to quantify suitability. This work was initially done in Kansas and the results were compared to Quivira National Wildlife Refuge, a traditional migratory stopover area. In Kansas, it was determined that a score of 12 or higher represented potentially suitable whooping crane habitat.

RESULTS

There is almost 17,588 ac of cropland within the proposed project area, or 47.5% of the total area. Pasture/hay lands make up approximately 38% of the project area while grass/herbaceous lands and developed areas occupy another 6.7% and 4.3% respectively. Water, forest, shrub/scrub, and barren habitats comprise the remaining 3.5% of the PWWP (Figure 2; Table 1).

Croplands, Grasslands, and Other Habitats

The percentage of cropland varied between the project area and comparison areas, with the PWWP containing the second lowest (47.5%) and the east comparison area the most (66.4%; Figure 2; Table 1). The south reference area had the least cropland (39.8%) with the north and west areas comprised of 54.1% and 55.4% cropland respectively (Table 1). All cropland has the potential as foraging areas for whooping cranes but crop type could influence the extent of use of a particular field during any one migration season.

Considering grassland/herbaceous and pasture/hay habitats as "grasslands", this habitat type also varied between analyzed areas (Figure 2; Table 1). The south (46.6%) had the most while the east reference area had the least (26.6%). Grassland percentages in the other three areas ranged from 44.2% (PWWP) to 34.8% (Table 1).

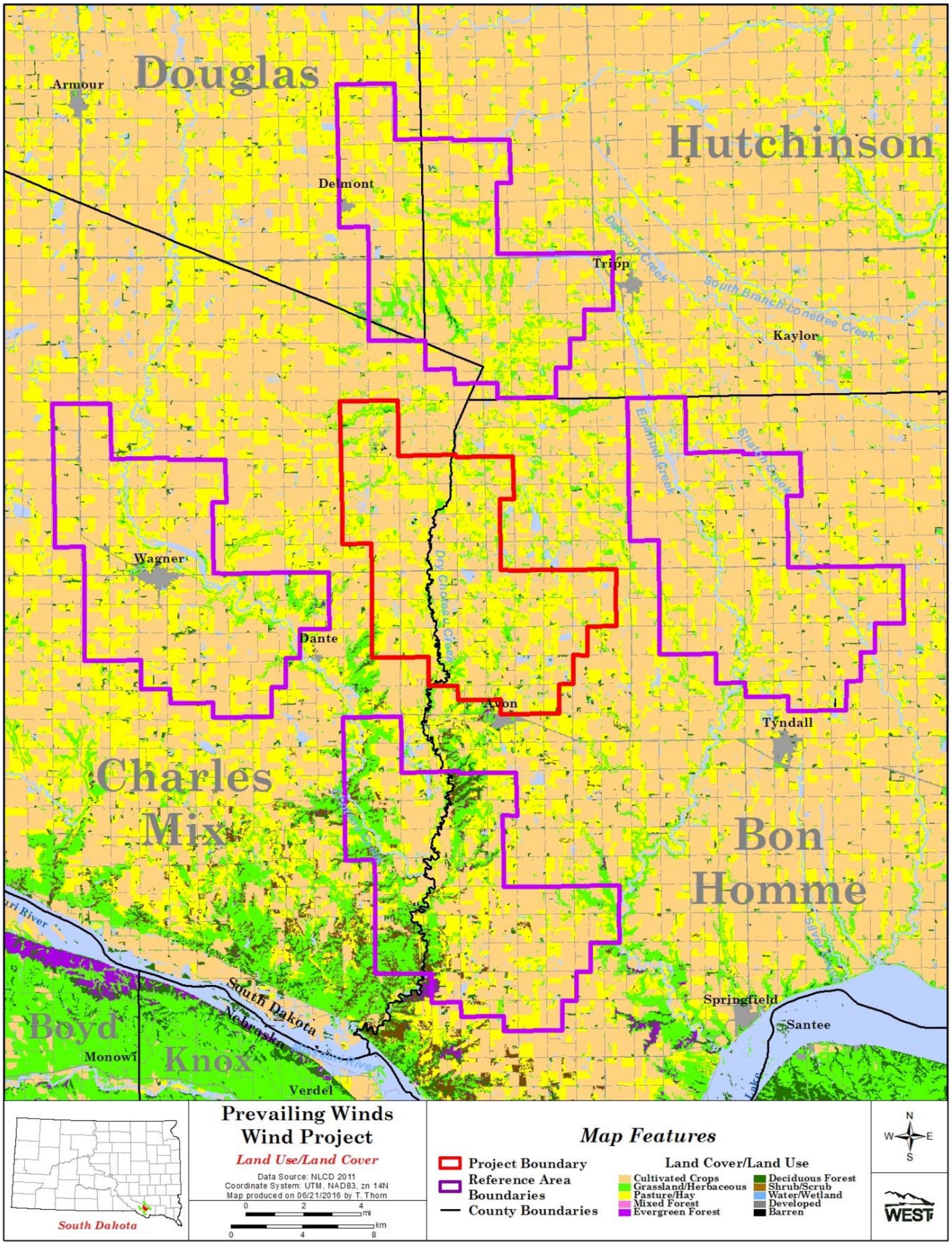

Figure 2. Land Use/Land Cover within and around the Prevailing Winds Wind Project.

The influence of grassland habitats on migrating whooping crane behavior is unknown; however, short grasslands (i.e. grazed pasture) adjacent to wetlands may provide loafing areas and cranes may utilize grasslands to some degree for foraging.

All other habitat types comprised approximately 8.3% of the PWWP's area. This is similar to the north, east, and west reference areas while in the south comparison area, other habitat types occupied 13.6% of the area. Shrub/scrub land made up almost half of the other habitats in this area (Figure 2; Table 1).

Table 1. Land Use/Land Cover within the Prevailing Winds Wind Project and adjacent areas.

	PWWP		North		East		South		West	
Habitat Type	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**Acres**	**%**	**cres**	**%**
Cultivated Crops	17,588.3	47.5	20,033.3	54.1	24,592.7	66.4	14,716.9	39.8	20,507.8	55.4
Grassland/Herbaceous	2,481.9	6.7	2,922.5	7.9	995.0	2.7	7,270.35	19.6	1,398.2	3.8
Pasture/Hay	13,897.5	37.5	11,676.7	31.5	8,853.2	23.9	9,985.0	27.0	1,1482.6	31.0
Developed	1,578.0	4.3	1,894.3	5.1	1,668.2	4.5	1,142.3	3.1	1,998.4	5.4
Water/Wetlands	1,016.5	2.8	327.6	0.9	562.2	1.5	682.0	1.8	1,086.7	2.9
Forests	372.1	1.0	152.5	0.4	307.5	0.8	958.8	2.6	441.8	1.2
Shrub/Scrub	67.5	0.2	9.7	<0.1	22.7	<0.1	2,251.6	6.1	93.3	0.3
Barren	14.7	<0.1			15.1	<0.1	9.7	<0.1	7.8	<0.1

National Land Cover Database - Fry et al. 2011.

Wetlands

NWI wetland data was used for this analysis because it represents wetland features to a higher degree than the NLCD. For this analysis, it is assumed that all wetlands are potential whooping crane roosting areas under one water regime or another (e.g., drought, normal, or flood). The PWWP had similar total acres, mean size and size range of wetland basins as the north and east reference areas (Table 2). Total number of wetland basins ranged from 792 in the PWWP to 924 in the east reference area. The south comparison area had the fewest basins (507) and the lowest total wetland acreage (688 ac). However, mean wetland size and wetland size range was similar to all other areas except the west comparison area (Table 2). The west reference area has by far the highest total wetland acreage (2,268.7 ac). However, almost 41% of the total acreage is made up of wetlands associated with Choteau Creek (Figure 3). This causes the size and acreage range of wetlands within this area to be somewhat misleading

Freshwater emergent (77.5%) made up the highest percentages of wetland types in the PWWP, with freshwater ponds accounting for another 14.7% (Table 3). Wetlands in all the comparison areas were 83% or greater freshwater emergent (Table 3). The west and south reference areas contained riverine wetlands with slightly more the 8% of wetlands in the west and 4% in the south classified as this wetland type (Table 3).

To summarize, the PWWP had similar wetland acreages and types as those for the north and east comparison areas and to a lesser extent the south area. The south reference area had the fewest wetland basins and smallest wetland total acreage but had similar mean wetland size and wetland size range to all other areas except the west. Wetland statistics (highest total wetland acreage, mean wetland size, and basin size range) for the west reference area were misleading due wetlands associated with Choteau Creek which intersects the area from north central to southeast (Figure 3).

Table 2. Comparison of the number of wetland basins and mean size within the Prevailing Winds Wind Project and adjacent areas.

Area	Basins	Total - acres	Mean Size - acres	Range - acres
PWWP	792	1,304.9	1.6	<0.1 – 63.4
North	913	1,158.0	1.3	<0.1 – 39.5
East	924	1,149.0	1.2	<0.1 – 34.6
South	507	687.8	1.4	<0.1 – 54.8
West	769	2,268.7	3.0	<0.1 – 919.8

Data Source: NWI data with wetland parts dissolved.

Table 3. Wetland types within the Prevailing Winds Wind Project and adjacent areas.

Wetland Type	PWWP Acres	PWWP %	North Acres	North %	East Acres	East %	South Acres	South %	West Acres	West %
Freshwater Emergent	1,011.0	77.5	962.8	83.1	987.9	85.9	610.9	88.8	1959.4	86.4
Freshwater Forested/Shrub	44.3	3.4	20.5	1.8	43.2	3.8	4.4	0.6	15.8	0.7
Freshwater Pond	192.2	14.7	122.6	10.6	95.0	8.3	43.4	6.3	79.4	3.5
Lake	57.4	4.4	52.0	4.5	23.9	2.1			24.7	1.1
Riverine							29.1	4.2	189.4	8.3

Data Source: NWI 2010.

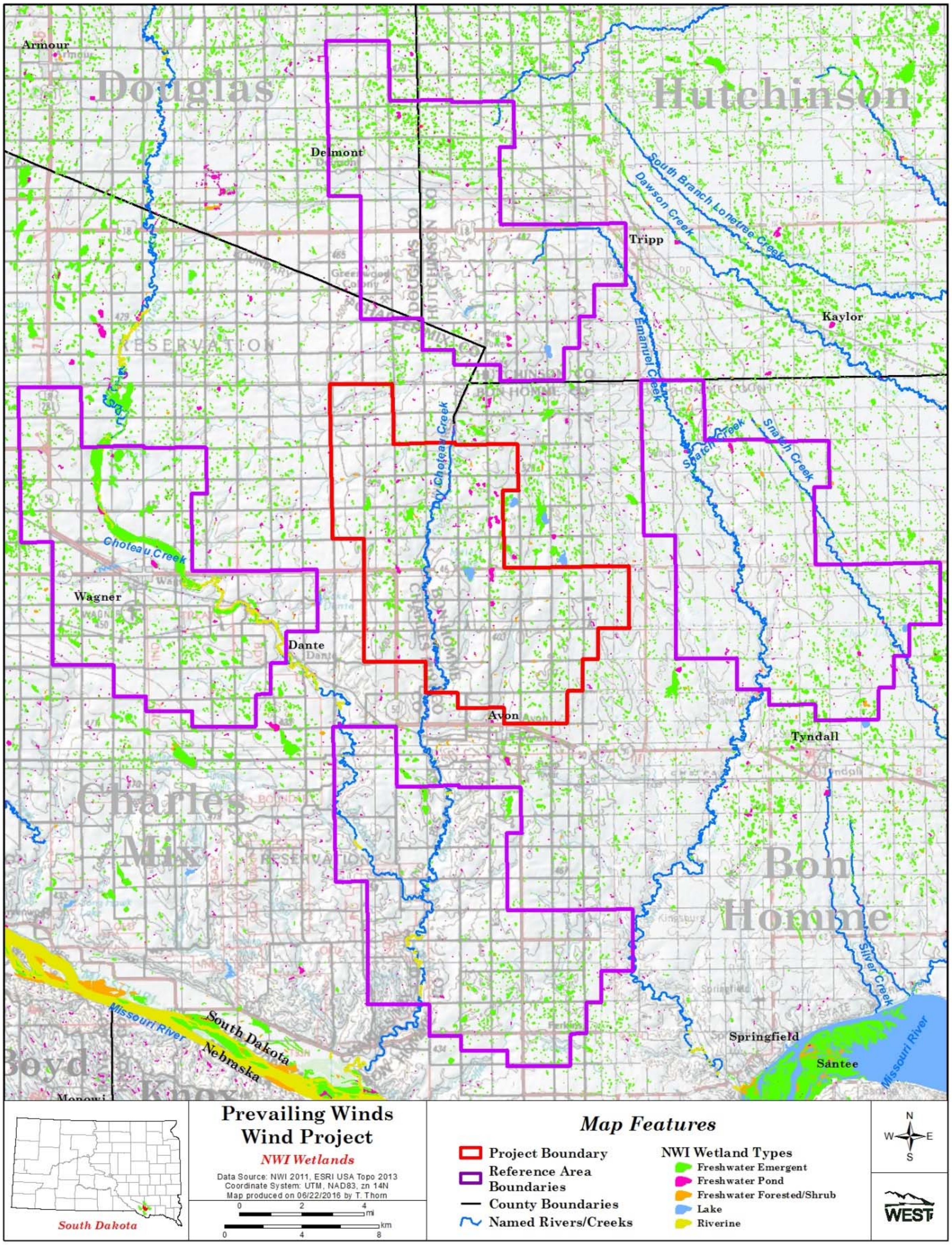

Figure 3. NWI wetlands within and around the Prevailing Winds Wind Project.

Whooping Crane Suitable Habitat Assessment

The habitat assessment model identified 262 wetland basins within the PWWP as potential whooping crane roosting habitat. The mean suitability score for these wetlands was 9.4 with the scores ranging from 6 to 16 (Table 4). This mean suitability score and range was similar to the score and range for three of the four reference areas. The exception being the southern comparison area which had the fewest potential whooping crane roosting wetlands, lowest total potential wetland acreage, lowest mean suitability score and lowest and narrowest score range (Table 4).

In Kansas, a wetland with a score of 12 or more was considered suitable potential whooping crane habitat (Watershed Institute 2012). If applied to the PWWP, there would be 41 wetlands (15.6% of identified potential whooping crane wetlands) considered as such. The south reference area would have only 13 and the north, east, and west comparison areas would have between 33 and 63 potentially suitable whooping crane wetlands

Table 4. Comparison of suitable whooping crane habitat within the Prevailing Winds Wind Project and adjacent areas.

Area	Basins	Total - acres	Mean Score	Score range
PWWP	262	490.1	9.4	6 – 16
North	270	517.2	9.8	6 – 18
South	157	285.9	8.4	5 – 14
East	244	395.6	9.7	6 – 16
West	284	1,239.8	9.8	6 – 17

Data Derived From: Potentially Suitable Habitat Assessment, Watershed Institute 2012.

Whooping Crane Stopover Site Use Intensity

USGS and its' partners recently determined whooping crane stopover sites and the intensity of use of these areas within the Great Plains using radio telemetry information from 2010 to 2014 of tagged whopping cranes (Pearse et al. 2015). Stopover sites and their use intensity were based on 20 km square grid cells.

The PWWP and the north review area fall within "unoccupied" 20 km cells while the east and west reference areas lie within "low intensity" cells and the south intersects a "core intensity" cell (Figure 1). USGS describes an "unoccupied" cell as "lacking evidence of use", "low intensity" cell shows "evidence of use and low stopover site use intensity", and a "core intensity" site "contains density of stopovers identified as high use intensity and crane days of lower intensity" (Pearse et al. 2015).

DISCUSSION

Whooping cranes are currently listed as endangered under the Endangered Species Act (32 FR 4001, 1967 March 11) except where nonessential experimental populations exist (66 FR 33903-33917, 2001 June 26; 62 FR 38932-38939, 1997 July 21; and 58 FR 5647-5658, 1993 January 22). In the US, the whooping crane was listed as threatened with extinction in 1967 and endangered in 1970 – both listings were "grandfathered" into the Endangered Species Act of 1973 (ESA 1973). The 2015 – 2016 winter population within the primary wintering grounds was estimated at 329 birds (291 – 371, 95% confidence interval.). There was another 10 whooping cranes thought to be outside of the primary wintering grounds when systematic surveys were conducted (USFWW 2016). Whooping cranes typically migrate from their breeding grounds in Wood Buffalo National Park, Canada to their wintering areas in Aransas National Wildlife Refuge, Texas. During the migration, most birds pass through central South Dakota.

The USGS has recently determined whooping crane stopover sites and their intensity of use within the Great Plains from radio telemetry information. This information shows whooping crane use directly to the south, east, and west of the project area. Although no whooping crane use was document within the 20 km grid cell the project falls within, at the least, it is possible that whooping cranes would fly over or through the project area during migration. Whooping cranes generally migrate at 1,000-6,000 ft (305-1830 m) altitude, well above turbine height (Stehn 2007), and thus for the most part are unlikely to collide with turbines. However, as whooping cranes ascend and descend during takeoff and landing, or migrate during inclement weather, they may fly at lower altitudes and may fly at altitudes corresponding to the rotor-swept areas. In summary, low altitude flight is generally of short duration in the morning and evenings with more time and distance covered at higher elevation during typical migration flight; reducing potential risk to whooping cranes.

No whooping cranes have been reported as being killed or injured by wind turbines (NWCC 2004), but one sandhill crane (*Grus canadensis*) was reported at the Altamont wind energy facility in California (Smallwood and Karas 2009), it is unclear if this was a result of turbine collision or collision with a power line. Two sandhill cranes were also apparently struck by turbines during a study of wintering cranes in Texas (Navarrete and Griffis 2011a). It appears that cranes are not overly susceptible to collision with turbines given that 100,000's sandhill cranes migrate twice annually through the Great Plains and none have been documented as wind turbine collision fatalities in this region during migration.

Besides direct mortality, concern has also been raised regarding potential displacement impacts that wind facilities may have on whooping cranes. For example, if whooping cranes avoid wind facilities, the likelihood of impacts with turbines is further decreased but the availability of habitat in the project area may be diminished, causing cranes to have to fly further to find suitable habitat to roost and forage. To date, very little quantitative data is available to help address displacement impacts on whooping cranes or sandhill cranes. A presentation by Navarrete and Griffis (2011b) suggested that the mean density of sandhill cranes wintering in the high plains of Texas increased the further away from studied wind facilities and this distribution was not a random event. There is an operating wind energy facility just north of the proposed project boundary. What, if any impact this facility has on crane use in and around the surrounding area is unknown.

Although developed for transmission line impacts on whooping crane habitat in Kansas, the Watershed Institute's (2012) potentially suitable habitat assessment for whooping cranes can help to quantify potential whooping crane habitat in and around a proposed wind energy project. This tool indicates that the range of scores and average score at the PWWP is similar to three of the four other study areas. The exception being the southern reference area which had fewer potential roost wetlands, with the average score for those basins one less than the other areas. Overall, the average score and the majority of the individual wetland scores were lower than the reference score of 12 developed for quality habitat at the Quivira National Wildlife Refuge.

SUMMARY

In analyzing the potential for significant impacts from wind development on whooping crane stopover habitat, Stehn (2007) suggests assessing whether there is "lots of suitable stopover habitat in the general area … or is the proposed wind farm site the only suitable whooping crane stopover habitat for miles around". This issue was investigated by comparing the potential whooping crane stopover habitat (using wetlands as this indicator) in the project area to surrounding (in the four cardinal directions) areas of the same dimensions, located adjacent (based on the PWWP's boundary extent) to the PWWP boundary. A Geographic Information System (GIS) was used to calculate the amount of the various habitats and in the case of wetlands, number of individual basins and their type, in each of the areas compared to the proposed PWWP (Tables 1, 2, and 3). This analysis shows that both roosting (i.e. wetlands) and foraging (i.e. croplands) habitats are available in the PWWP and alternate areas. Potential whooping crane habitat within the PWWP appears to be most similar to that in the north, east, and west reference areas and more suitable than that found in the south alternate area. Based on the USGS's recent determination of whooping crane stopover use sites adjacent to the proposed project area, whooping cranes will likely migrate over or through the PWWP during some migration period. There is potential whooping habitat within the PWWP but this habitat is not unique compared to adjacent areas.

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APPENDIX L - BIRD AND BAT CONSERVATION STRATEGY

Bird and Bat Conservation Strategy

Prevailing Wind Park Project

Bon Homme, Charles Mix, and Hutchinson Counties, South Dakota

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WEST Inc.

EXECUTIVE SUMMARY

Prevailing Wind Park, LLC (Prevailing Wind) is developing the Prevailing Wind Park Project (Project) near Avon, South Dakota. As part of the wind energy development process, Prevailing Wind voluntarily implemented the tiered approach detailed in the final Land-Based Wind Energy Guidelines (WEG) and incorporated agency recommendations in Project survey efforts and development. The purpose of this Bird and Bat Conservation Strategy is to develop and implement a program to identify and minimize risks to avian and bat species that may result from construction and operation of the Project.

Information gathered during Tier 1, 2, and 3 studies was used during the development process to reduce potential impacts to birds and bats and their habitats. Tier 1 and 2 studies included a review of environmental characteristics and other aspects to help inform the Project in an overall sense. This analysis, as well as the Project's biological and environmental assessments, concluded that the Project area was suited for wind energy development and any significant impacts could be avoided, minimized, or mitigated with pre-construction design and siting.

Tier 3 studies included whooping crane habitat assessment, avian use surveys, raptor and eagle nest surveys, acoustic bat surveys, and northern long-eared bat presence/absence surveys, to help determine impacts to birds and bats and assist in avoiding and minimizing impacts. Results of these studies indicated that no direct or indirect impacts to whooping cranes were expected, but due to the location of the Project and the whooping crane migration corridor, whooping cranes could use the Project area. Direct impacts to migratory birds were anticipated to be similar to other wind projects in South Dakota and elsewhere in the Midwest. Direct impacts to bald and golden eagles were unlikely as a result of low eagle use within the Project area. No eagle nests were found in the Project; however, nests were observed in the surrounding areas. Impacts to bats were anticipated to be low and within the range of other wind energy projects in South Dakota and the Midwest region. Northern long-eared bats were detected within the Project area during bat acoustic surveys in 2015, but the Project was revised to be several miles away from the area of detection.

Tier 4 studies planned include post-construction studies to estimate the actual impacts the Project has on birds and bats. For this Project, the focus will be on the Tier 4a questions set forth in the WEG. Post-construction surveys will include fatality monitoring (i.e., standardized carcass searches and bias trials), operations personnel training, and adaptive management as deemed necessary. Given that the information collected during the pre-construction period indicated that the Project is not likely to cause significant adverse impacts, per the WEG, it is not anticipated that Tier 5 research will be necessary at this Project.

This document includes whooping crane migration use data from the Central Flyway stretching from Canada to Texas, collected, managed, and owned by the US Fish and Wildlife Service (USFWS). Data were provided to Western Ecosystems, Technology, Inc. (WEST), as a courtesy for their use. The USFWS has not directed, reviewed, or endorsed any aspect of the use of these data. Any and all data analysis, interpretation, and conclusions from these data are solely those of WEST.

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1.0 INTRODUCTION

The Prevailing Wind Park Project (Project) is located in Bon Homme, Charles Mix, and Hutchinson counties, South Dakota (Figure 1). The Project area was changed over the course of Tier 1, 2, and 3 studies, with different but overlapping Project areas surveyed in 2015 and 2016. The current Project boundary continues to be overlapping with those studies in 2015 and 2016, but extends somewhat outside of both areas to the northwest and northeast. Overall landscape characteristics are similar throughout the region contained within the boundaries. As part of the wind energy development process, Prevailing Wind Park, LLC (Prevailing Wind) has been implementing the US Fish and Wildlife Service's (USFWS) *Land-Based Wind Energy Guidelines* (WEG; USFWS 2012)). This Bird and Bat Conservation Strategy (BBCS) describes Prevailing Wind's process to identify and avoid and/or minimize potential impacts to birds and bats that may result from the construction and operation of the Project.

Specifically, this BBCS document was developed to:

1) Respond to the recommendations in the WEG for completion of a BBCS and post-construction monitoring actions;
2) Consolidate documentation of steps already taken to avoid and minimize potential effects on birds and bats during Project planning and development;
3) Identify and implement steps to further reduce the potential for avian and bat fatality or other potential adverse effects on birds and bats at the Project; and
4) Continue the coordination between Prevailing Wind and state and federal wildlife agencies.

1.1 Project Description

The Project mostly falls within the Southern Missouri Coteau Slope Level IV Ecoregion, with only a small portion falling within the Southern Missouri Coteau Level IV Ecoregion (US Environmental Protection Agency 2013). Historically, this area was dominated by mixed-grass prairie with numerous wetlands scattered throughout; today, the majority of the Project area has been converted to agricultural use, with crop production and livestock grazing as the main agricultural practices (Table 1, Figure 2; US Geological Survey (USGS) National Land Cover Database [NLCD] 2011, Homer et al. 2015). Trees and shrubs can be found around farmsteads, within planted shelter belts, and along drainages (Hamilton and Derby 2016; Appendix A). The landscape within the Project area is generally flat with elevation ranging from 455–574 meters (m; 1,491–1,882 feet [ft]; USGS 2016).

The 2015 Project area included land south of Avon, South Dakota, but in 2016, the Project area was reduced (Figure 2); the 2015 Project boundary was 8.2 miles (mi; 13.2 kilometers [km]) from the Missouri River, while the adjusted 2016 boundary was 12.1 mi (19.5 km) from the River. Additionally, the current Project boundary extends somewhat further to the northwest and northeast (Figure 2). Land use/cover types were assessed using the current boundary.

Cultivated cropland (49.92%) and grasslands (42.22%; including herbaceous/pasture/hay lands) dominated the overall landscape (Table 1, Figure 2).

Table 1. Land use/cover types acreage and percent (%) cover within the current Prevailing Wind Park Project in Bon Homme, Charles Mix, and Hutchinson counties, South Dakota, based on the US Geological Service's (USGS) National Land Cover Database (NLCD).

Land Use/Cover	Project Acres	% Cover
Cultivated Crops	25,128.83	49.92
Pasture/Hay	17,731.32	35.23
Grassland/Herbaceous	3,520.49	6.99
Developed	2,158.00	4.29
Wetlands/Open Water	1,336.99	2.66
Forest	375.96	0.75
Shrub/Scrub	69.65	0.14
Barren Land	14.67	0.03
Total	**50,335.91**	**100.00**

Data Source: USGS NLCD 2011

Based on the USFWS's National Wetland Inventory (NWI; USFWS NWI 2009), there are approximately 1,826 acres (ac; 739 hectares [ha]) of wetlands within the Project area, with freshwater emergent wetlands making up the majority (77.1%) of wetlands (Table 2).

Table 2. Wetlands present within the Prevailing Wind Park Project, Bon Homme, Charles Mix, and Hutchinson counties, South Dakota, based on the US Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI).

Wetland Type	Project Acres	Percent Total
Freshwater Emergent Wetland	1,407.89	77.10
Freshwater Pond	245.70	13.46
Lake	128.75	7.05
Freshwater Forested/Shrub Wetland	43.7	2.39
Total	**1,826.04**	**100.00**

Data Source: USFWS MWI 2009

Figure 1. Location of the Prevailing Wind Park Project in Bon Homme, Charles Mix, and Hutchinson counties, South Dakota.

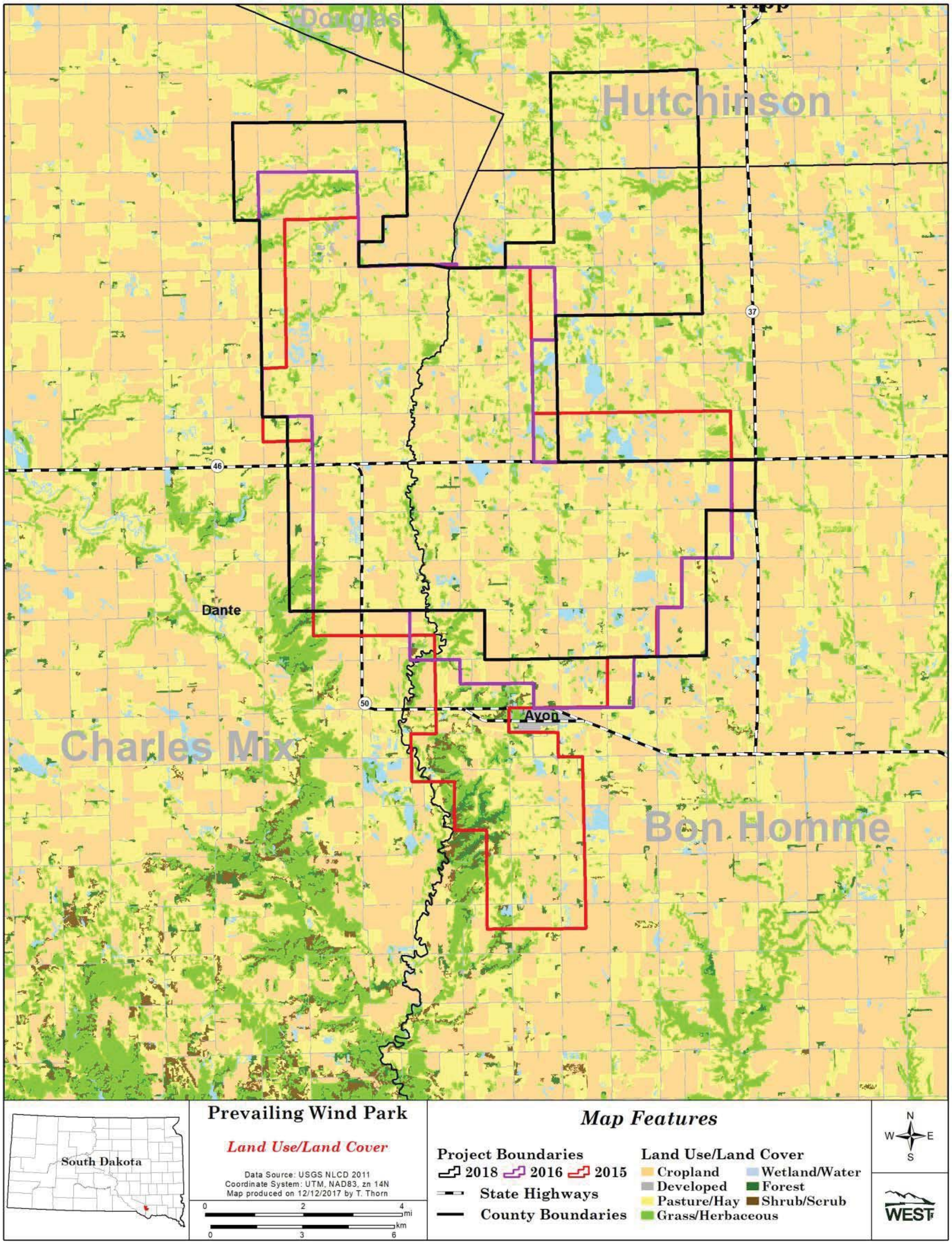

Figure 2. Land use/cover types within the 2015, 2016, and current Prevailing Wind Park Project boundaries in Bon Homme, Charles Mix, and Hutchinson counties, South Dakota (Sources: US Geological Survey (USGS) National Land Cover Data [NLCD] 2011, Homer et al. 2015).

The Project, planned for 200-megawatt (MW) output, will consist of either 57 3.6-MW turbines or 61 3.8 MW turbines. Turbines will have a hub height of 105 or 110 m (344.5 or 360.9 ft) with 136 or 137 m (446.2 or 449.5 ft) blades.

1.2 Project Siting, Construction, and Best Management Practices

The siting and development of the Project included a tiered-study review process that aligned closely with the tiered approach detailed in the final WEG (USFWS 2012). Information gathered during Tier 1–3 studies was used during the turbine and infrastructure siting process to minimize potential impacts to birds and bats and their habitats. Prior to designing the facility layout, Prevailing Wind incorporated setback and constraint information from expert sources, literature reviews, and siting standards suggested by the South Dakota Public Utilities Commission. This information was used to establish setbacks and inform site design.

1.2.1 Project Siting and Design Measures Used to Reduce Impacts

- The Project is attempting to avoid impacts to wildlife and habitat by siting turbines and roads mostly in cultivated fields.
- Standard, state-required, setbacks for non-participating landowners, residences, noise, airports, etc., will be implemented.
- Existing roads and field accesses will be used or improved for access roads when practicable.
- Electrical collection systems within the Project will be buried underground.
- Wind turbines designed with tubular towers and no external ladders or platforms on the towers or nacelles will be used so bird perching and nesting opportunities are minimized.
- The number of turbines with visibility lighting will be minimized, within Federal Aviation Administration (FAA) requirements.
- Implementation of FAA-approved lighting that uses the shortest allowable flash duration, the minimum allowed flashes per minute, and synchronized flashing, will reduce the potential for nocturnal migrating birds to be disoriented by lights.
- Lighting at the operations and maintenance facility, Project substation, and other installations will be minimized and designed such that light is directed downward (toward the access or work area), and is hooded to prevent light from shining into the sky and attracting or disorienting nocturnal migrants. Motion or heat-activated lighting will be used where practicable.
- Permanent meteorological towers without guy wires will be used, installing the minimum number needed within the Project area to minimize collision risk for birds.

1.2.2 Operational Procedures to Minimize Impacts

- Impacts to wetlands and water resources will be avoided or mitigated by following provisions of the Clean Water Act (1972).

- A Site Environmental Plan, specific to the operational activities of the Project, will be developed and implemented by the Site Supervisor or his/her designated Environmental Manager including, but not limited to:
  - Exhibits identifying sensitive resources and associated set-backs.
  - An employee orientation program to raise awareness of any wildlife issues on the site, as well as how to treat sensitive resource areas.
  - Instructions for employees and contractors to drive at an appropriate speed on all public and private roads within the Project area, in consideration of potential wildlife that may be present and to promote general site safety.
  - Instructions for employees to avoid harassing or disturbing wildlife, especially during the breeding seasons.
  - Federal and state measures for handling toxic substances to minimize contamination of water and wildlife resources.
  - Local policies for noxious weed control (e.g., cleaning vehicles and equipment arriving from areas with known invasive species issues, using locally sourced topsoil, identification and annual removal, etc.).
  - Parts and equipment that may be used as cover by prey will not be stored in the vicinity of wind turbines.
- During normal operational activities, if facility personnel discover carrion on or near Project facilities, reasonable measures will be taken to minimize attracting predators/scavengers such as raptors and vultures.
- A Wildlife Response and Reporting System or similar program will be implemented to establish protocols for identifying and communicating bird and bat fatalities.

1.3 Key Bird and Bat Regulations

1.3.1 Federal Endangered Species Act

Certain species at risk of extinction, including several birds and bats, are protected under the federal Endangered Species Act (ESA) of 1973, as amended (ESA 1973). The federal ESA provides a program for conservation and recovery of threatened and endangered species. Section 3 of the ESA defines and lists species as “endangered” and “threatened” and provides regulatory protection for the listed species (ESA Section [§] 3 1973). Section 9 of the federal ESA prohibits the “take” of species listed by USFWS as threatened or endangered (ESA Section [§] 9 1973). Take is defined in Section 3 as follows: “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in such conduct” (ESA § 3 1973). As of February 2017, there were 16 endangered and threatened animal species believed to or known to occur in South Dakota (USFWS 2017), five of which had the potential to occur within the Project area according to the Tier 1 and 2 studies (Hamilton and Derby 2016; Appendix A); Section 2.1 includes a description of these species.

1.3.2 Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) makes it unlawful to pursue, capture, kill, or possess any migratory bird or part, nest, or egg of any such bird listed in wildlife protection treaties between the US, Great Britain, Mexico, Japan, and Russia (and other countries of the former Soviet Union; MBTA 1918). Most birds (except for introduced species and non-migratory game birds) within the US are protected under the MBTA. The birds, occupied nests, and the contents of the nests (eggs or chicks) within the Project area are afforded protection pursuant to the MBTA. Due to the potential for resident and migratory birds within the Project area, compliance with the MBTA has been considered in the development of this BBCS. Unlike the ESA and the Bald and Golden Eagle Protection Act (BGEPA), no permits are available to authorize incidental take of birds under the MBTA. However, on December 22, 2017, the U.S. Department of the Interior's Solicitor's Office issued a legal opinion in which it concluded that the MBTA ". . . is a law limited in relevant part to affirmative and purposeful actions . . ." and as such, any incidental takings would not constitute criminal violations (*See*, DOI Solicitor's Opinion, M-37050 [December 22, 2017]).

1.3.3 Bald and Golden Eagle Protection Act

The federal BGEPA (1940), administered by the USFWS, was enacted to protect bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles, their nests, eggs, and parts (e.g., feathers or talons). The BGEPA states that no person shall take, possess, sell, purchase, barter, offer for sale, transport, export, or import any bald or golden eagle alive or dead, or any body part, nest or egg without a valid permit to do so (BGEPA 1940). The BGEPA also prohibits the take of bald and golden eagles unless pursuant to regulations. Take is defined by the BGEPA as an action "to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb". Disturb is defined in the BGEPA as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: 1) injury to an eagle; 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior; or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (USFWS 2007b). In addition to immediate impacts, this definition also covers impacts that result from human-caused alterations initiated around a previously used nest site during a time when eagles were not present.

In 2009, the USFWS issued a final rule on new permit regulations that would allow some disturbance of eagles "in the course of conducting lawful activities" (50 Code of Federal Regulations [CFR] § 22.26 2009). The USFWS's description of its 2009 rule suggests that recurring, incidental take of eagles, will only be authorized if every avoidance measure has been exhausted. Removal of nests will still generally be permitted only in cases where the nest poses a threat to human health, or where the removal would protect eagles. Take permits may be issued when "necessary for the protection of other interests in any particular locality" (USFWS 2009). The discussion expands the definition of such public and private interests to include utility infrastructure development and maintenance. The document states that due to concerns about population declines, permits for take of golden eagles are likely to be restricted throughout the eagle's range (USFWS 2009). Considerations for issuing take permits include the health of the local and regional eagle populations, availability of suitable nesting and foraging habitat for any displaced eagles, and whether the take and associated mitigation provides a net benefit to eagles (50 CFR § 22.26 2009). In April 2013, the USFWS issued the *Eagle Conservation Plan Guidance Module 1 – Land-based Wind Energy Version 2* to address these new regulatory matters (ECPG; USFWS 2013). In December 2016, the USFWS published notice of a final rule revising its eagle permitting regulations and extended the maximum permit duration to 30 years. The development of an Eagle Conservation Plan for this Project is underway following the 2016 eagle rule to meet USFWS's requirements for addressing take under the BGEPA.

1.3.4 Birds of Conservation Concern

The USFWS's list of Birds of Conservation Concern (BCC) includes migratory and non-migratory bird species of conservation priority across North America; concern for these BCC species results from naturally or human-caused small ranges or population sizes, threats to habitat and other factors (USFWS 2015b). The Project area falls within Bird Conservation Region 11, which lists 27 bird species (USFWS 2008).

1.3.5 South Dakota State Issues

The South Dakota Game, Fish, and Parks (SDGFP) manages a state-specific list of endangered and threatened species. As of April 2016, South Dakota listed 16 endangered and threatened species that did not appear on the federal list for a total of 22 state-listed species; the SDGFP is responsible for managing and conserving the state's endangered species. Seven of the 22 state-listed species are birds; no state-listed bat species were included in this list (SDGFP 2014a). Seventy-seven species listed by the South Dakota Wildlife Action Plan as species of greatest conservation need have records of occurrence in at least one of the counties in which the Project is located (SDGFP 2014a, SDGFP 2014b; USGS 2015; NatureServe 2017). Some of these species are only associated with the Missouri River and would not be expected to occur in the Project. Section 2.1 includes a description of the state-listed species potentially occurring in the Project area.

2.0 PRE-CONSTRUCTION: TIER 1-3 SUMMARIES

The WEG outlines a tiered approach to assessing suitability and risks to wildlife at a potential wind resource area. The tiered approach ensures that sufficient data are collected to enable project proponents to make informed decisions about continued development of a proposed project (USFWS 2012). At each tier, potential issues associated with the development or operations of the opposed project are identified and questions are formulated to guide the decision process. This process starts with a broad scope and provides more site-specific detail at each tier as more data are gathered and the potential for avian and bat issues are better understood. The sections below briefly describe the efforts completed as part of Tiers 1–3 studies (Appendices A–F).

2.1 Tiers 1 and 2: Desktop Evaluation Review

As recommended in the WEG, Tier 1 and 2 studies for the Project evaluated potential issues that needed to be addressed before further actions could be taken with the development or operations of the proposed Project. The objective of the Tiers 1 and 2 studies was to assist the developer in further identifying a potential Project site through a preliminary evaluation or screening of public data from federal, state, and tribal entities, and to offer early guidance about the sensitivity of the Project in regards to flora and fauna. Tier 1 and 2 studies provided a preliminary evaluation or screening of public data from federal, state, and tribal entities and offered early guidance about the sensitivity of the site, in regards to flora and fauna; these studies also included a more substantive review of existing information, including publicly available data on land use land cover, topography, wetland data, wildlife, habitat, and sensitive plant distribution, and a reconnaissance level site visit (Hamilton and Derby 2016; Appendix A)

The Tier 1 and 2 Report identified federally and state-listed wildlife species present in the Project area (Hamilton and Derby 2016; Appendix A). Five of the 16 animal species listed as federally listed species in South Dakota had the potential to occur within the Project area, including the federally endangered interior least tern (*Sterna antillarum athalassos*) and whooping crane (*Grus americana*), and the federally threatened piping plover (*Charadrius melodus*), red knot (*Calidris canutus rufa*), and northern long-eared bat (*Myotis septentrionalis*). The interior least tern, whooping crane, and piping plover are also listed as threatened or endangered in the state of South Dakota (SDGFP 2016); additionally, the state-threatened osprey (*Pandion haliaetus*) has the potential to occur within the Project area (Hamilton and Derby 2016; Appendix A).

According to the Tier 1 and 2 studies, no suitable nesting habitat for interior least tern was identified within the Project, but the interior least tern could potentially nest along the Missouri River or pass through the Project area during spring and fall migration (Hamilton and Derby 2016; Appendix A). No suitable habitat for piping plover was observed in the Project during the site visit conducted in 2016, and this species is unlikely to breed within the Project, but individuals could potentially migrate through the Project area; piping plover Critical Habitat has been designated along the Missouri River in both counties 19.5 km (12.1 mi) south of the Project area (Appendix A). No suitable habitat for rufa red knot was observed in the Project during the site visit conducted in 2016 and this species is unlikely to breed within the Project, but could potentially migrate through the Project area (Appendix A). The 2016 Project boundary occurred 3.5 km (2.2 mi) east of 95% of the confirmed whooping crane sightings within the 354-km (220-mi) whooping crane national migration corridor (Figure 3), but is within the South Dakota specific migration corridor; therefore, whooping cranes may occasionally migrate through the Project area (Appendix A).

The Tier 1 and 2 studies recommended coordinating with the USFWS and South Dakota Game, Fish, and Parks in regards to Project development. This coordination occurred during an in person site visit and was used for both the formal scoping process in the Tier 3 studies as well as to inform ongoing Project siting. In conclusion, the Tier 1 and 2 studies did not find any items that suggested abandonment of the Project area, and as such, the pre-construction efforts progressed to Tier 3 studies to further investigate issues in more detail.

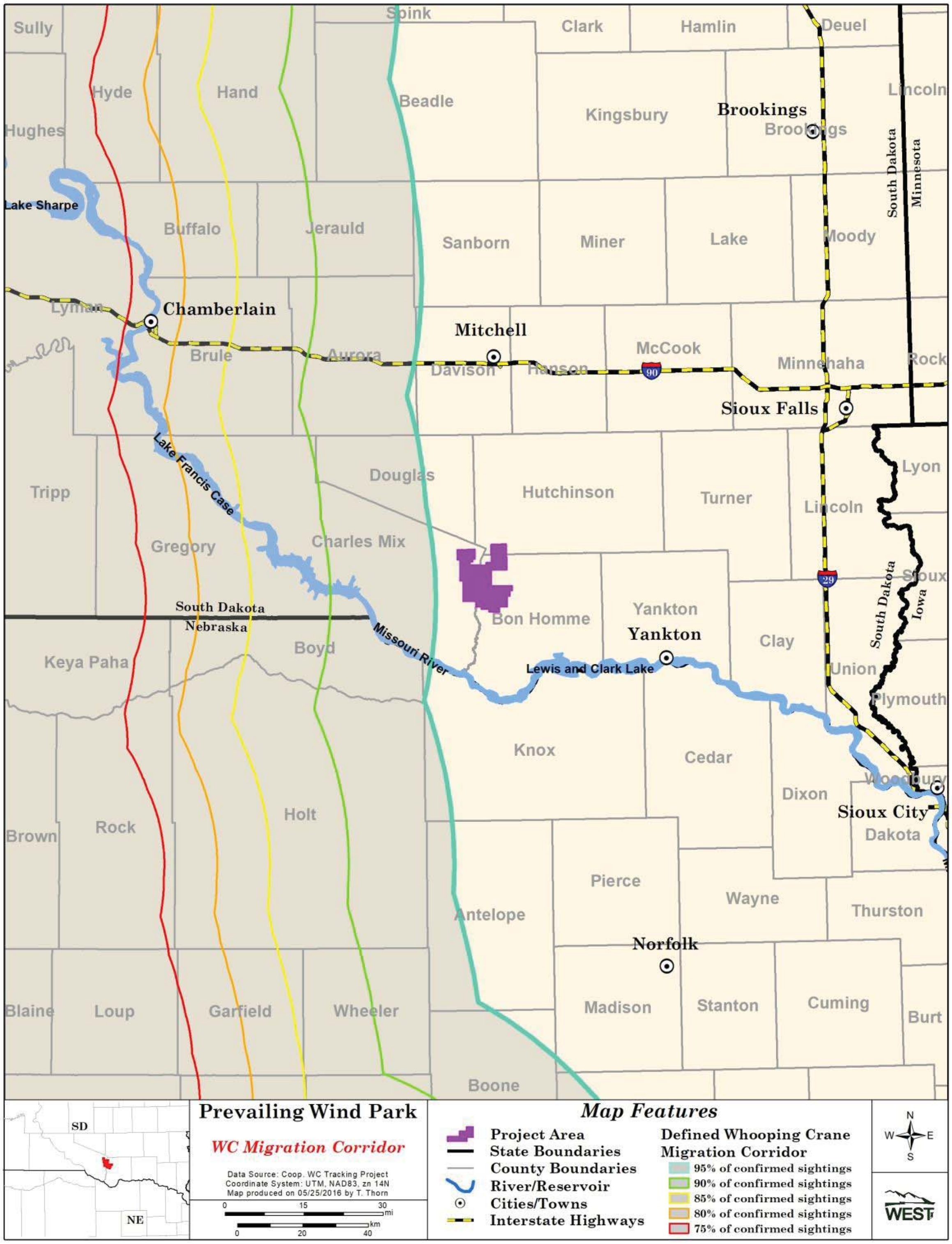

Figure 3. Location of the national whooping crane migration corridor in relation to the 2016 Prevailing Wind Park Project in Bon Homme, Charles Mix and Hutchinson counties, South Dakota.

2.2 Tier 3: Baseline Survey Results Review

A number of site-specific baseline avian and bat studies have been conducted within the Project area since 2015. A brief summary of each of these baseline studies is provided below and final reports are provided in Appendices B–F. The data collected and methods used to conduct the Tier 3 studies were consistent with other regional studies and followed the recommendations in the WEG. The results of Tier 3 studies indicated that significant adverse impacts are not anticipated from the Project.

2.2.1 Whooping Crane Habitat Review

Whooping crane habitat was assessed within the Project and surrounding area to determine if the Project area contained unique features to attract whooping cranes (Derby 2016b; Appendix B). This issue was investigated by comparing the potential whooping crane stopover habitat (using wetlands as this indicator) in the Project area to adjacent areas of the same dimensions in the four cardinal directions, located adjacent to the Project boundary, based on the Project's boundary extent (Figure 4). GIS was used to calculate the amount of the various habitats and in the case of wetlands, number of individual basins, their type, and suitability (score of 12 or higher according to the Watershed Institute 2012), in each of the adjacent areas compared to the proposed Project (Tables 3 and 4). This analysis showed that both roosting (i.e., wetlands) and foraging (i.e., croplands) habitats were available in the Project and alternate areas.

Potential whooping crane habitat within the Project appeared to be most similar to that in the north, east, and west reference areas and more suitable than that found in the south alternate area (Derby 2016), indicating that the potential whooping crane habitat found within the Project was not unique compared to adjacent areas. Based on the USGS's recent determination of whooping crane stopover use sites and their intensity of use within the Great Plains Region from radio telemetry information (Pearse et al. 2015), whooping crane use occurs adjacent to the proposed Project area, and it is possible that this species could fly over or through the Project area during the migration period (Appendix B).

Table 3. Comparison of land use/cover acreage and percent (%) cover for whooping crane habitat assessment within the 2016 Prevailing Wind Park Project in Bon Homme, Charles Mix and Hutchinson counties, South Dakota, and adjacent areas.

Habitat Type	Project Area		North		East		South		West	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Cultivated Crops	17,588.3	47.5	20,033.3	54.1	24,592.7	66.4	14,716.9	39.8	20,507.8	55.4
Grassland/ Herbaceous	2,481.9	6.7	2,922.5	7.9	995.0	2.7	7,270.3	19.6	1,398.2	3.8
Pasture/Hay	13,897.5	37.5	11,676.7	31.5	8,853.2	23.9	9,985.0	27.0	1,1482.6	31.0
Developed	1,578.0	4.3	1,894.3	5.1	1,668.2	4.5	1,142.3	3.1	1,998.4	5.4
Water/ Wetlands	1,016.5	2.8	327.6	0.9	562.2	1.5	682.0	1.8	1,086.7	2.9
Forests	372.1	1.0	152.5	0.4	307.5	0.8	958.8	2.6	441.8	1.2
Shrub/Scrub	67.5	0.2	9.7	<0.1	22.7	<0.1	2,251.6	6.1	93.3	0.3
Barren	14.7	<0.1	NA	NA	15.1	<0.1	9.7	<0.1	7.8	<0.1

National Land Cover Database 2011

Table 4. Comparison of suitable whooping crane habitat within the 2016 Prevailing Wind Park Project in Bon Homme, Charles Mix and Hutchinson counties, South Dakota, and adjacent t areas.

Area	Number of Basins	Total Acres	Mean Score[1]	Score Range
Project Area	262	490.1	9.4	6–16
North	270	517.2	9.8	6–18
South	157	285.9	8.4	5–14
East	244	395.6	9.7	6–16
West	284	1,239.8	9.8	6–17

1. A score of 12 or higher represents potentially suitable whooping crane habitat. Data Derived From: Potentially Suitable Habitat Assessment, Watershed Institute 2012.

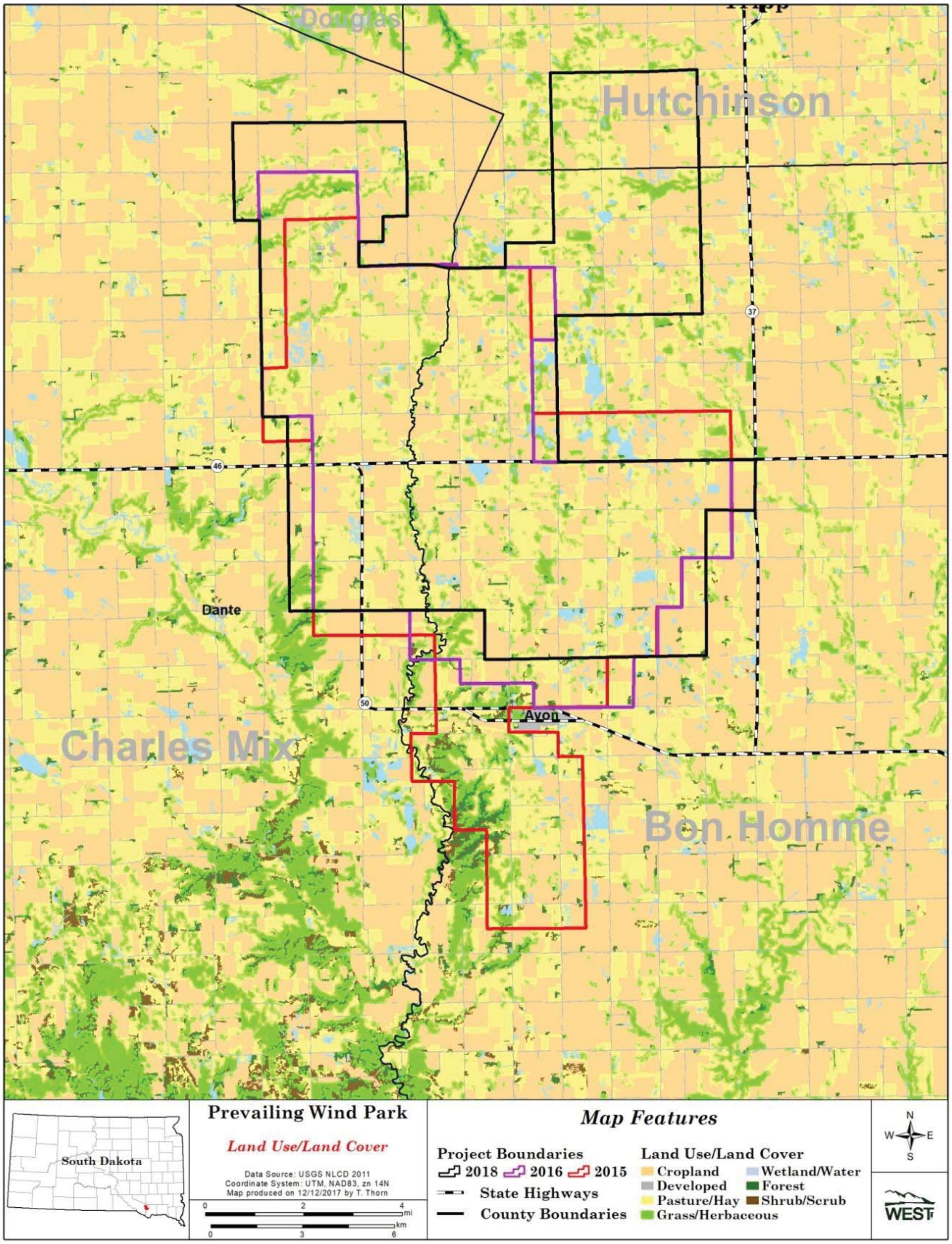

Figure 4. Land use/cover type comparisons for whooping crane habitat assessment within the 2016 Prevailing Wind Park Project in Bon Homme, Charles Mix, and Hutchinson counties, South Dakota, and adjacent areas.

2.2.2 Avian Use Surveys

Year-round avian-use surveys were conducted by WEST during 2015 – 2016 (Year 1) and 2016 – 2017 (Year 2) to address issues posed under Tier 3, following guidance in the WEG (USFWS 2012) and ECPG (USFWS 2013), within the Project area. The primary objectives of the avian use studies were to: 1) assess the relative abundance and spatial distribution of species in the Project area during an entire year, with emphasis on eagles, other raptors, and federally and state-listed species; and 2) identify and assess the potential risk of adverse impacts from the Project to sensitive species or groups (Derby et al. 2018a, 2018b; Appendices C1 and C2).

During Years 1 and 2, sixteen points were surveyed for 60 minutes (min; Figures 5 and 6) with all bird species observed in the first 20 min being recorded and only eagles and federally and state-listed species being recorded during the remaining 40 min (Appendices C1 and C2). The metric used for mean bird use was number of birds per plot (100-m [328-ft]) radius plot for small birds and 800-m [2,625-ft] radius plot for large birds) per 20-min survey. Surveys were conducted twice per month in the spring (March 4 – May 20) and fall (September 9 – November 28), and monthly during winter (November 29 – March 3) and summer (May 21 – September 8). Surveys were carried out during daylight hours and survey periods varied to approximately cover all daylight hours during a season. To the extent practical, each point was surveyed roughly the same number of times.

A total of 271 fixed-point avian use surveys were conducted during 18 visits during Year 1, while 205 surveys were conducted during 13 visits in Year 2 (Appendices C1 and C2). Bird diversity (the number of unique species observed for the entire 60-min survey) was lower in Year 1 (72) than Year 2 (90). No federally or state-listed species were observed during Year 1 surveys, and one state-listed species (peregrine falcon [*Falco peregrinus*]) was observed during Year 2 surveys. Additionally, seven and thirteen state sensitive species were observed during fixed-point surveys and incidentally during Years 1 and 2, respectively.

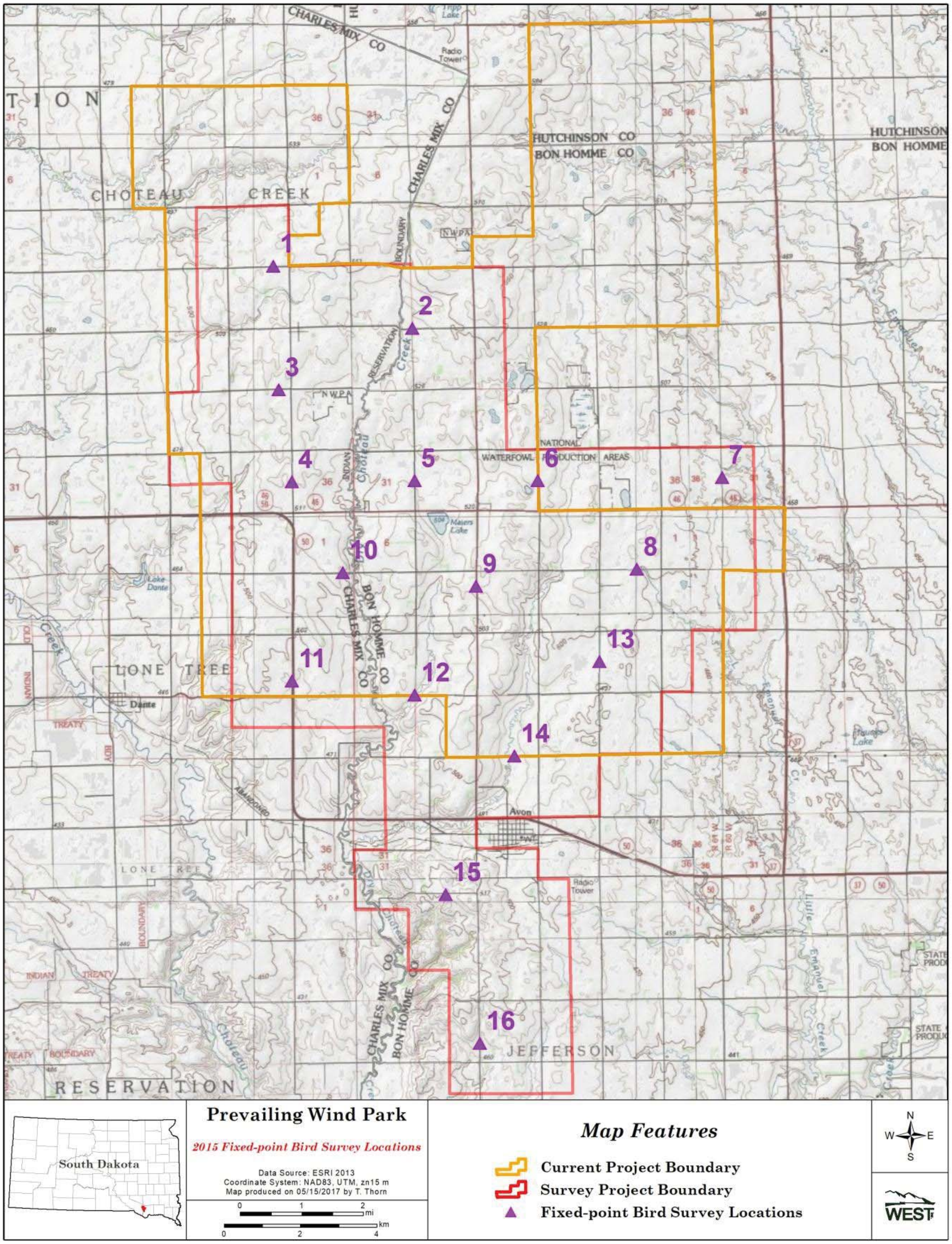

Figure 5. Location of the fixed-points selected for the Year 1 fixed-point avian use surveys conducted from 2015 – 2016 at the Prevailing Wind Park Project in Bon Homme, Hutchinson, and Charles Mix counties, South Dakota.

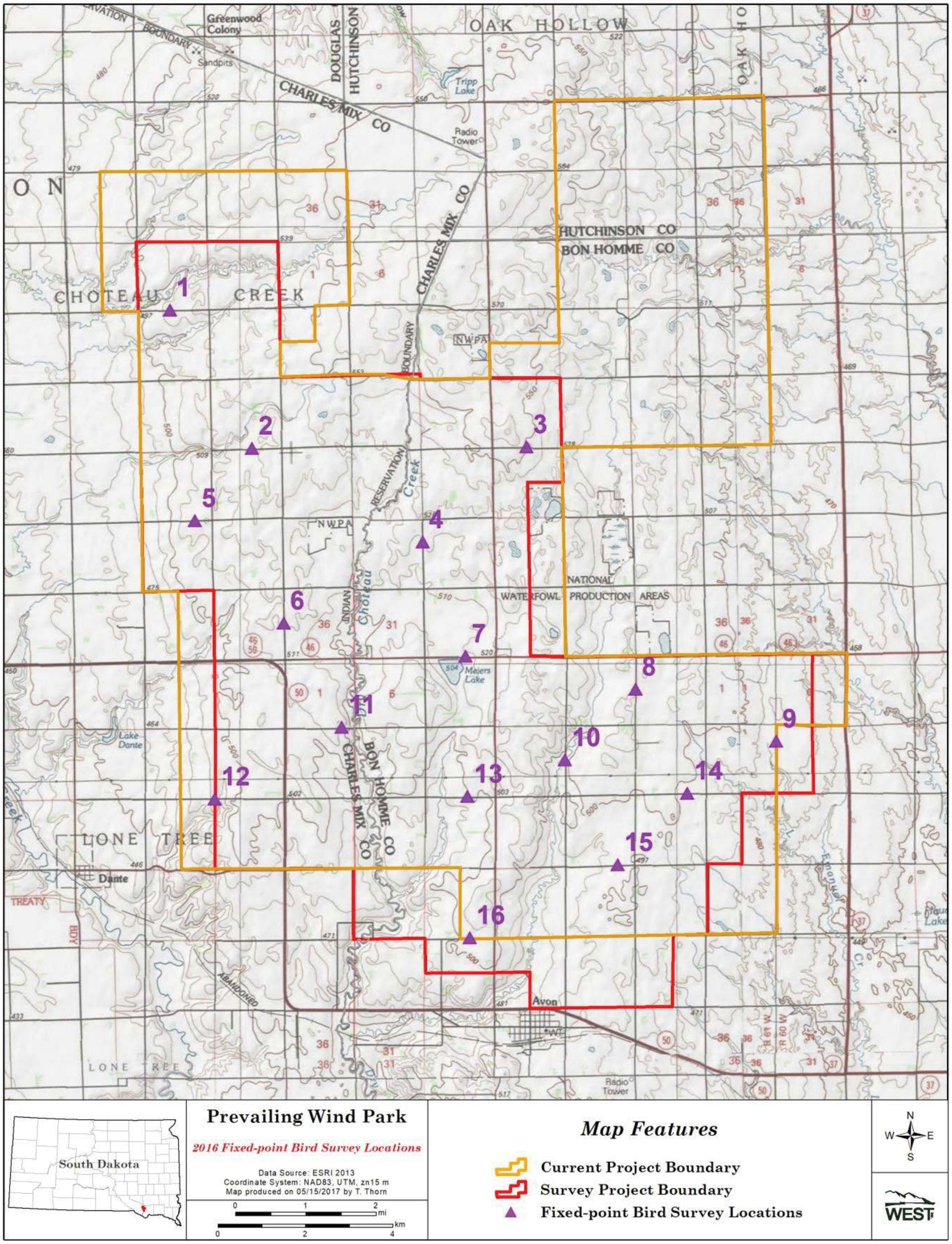

Figure 6. Location of the fixed-points selected for the Year 2 fixed-point avian use surveys conducted from 2016 – 2017 at the Prevailing Wind Park Project in Bon Homme, Hutchinson, and Charles Mix counties, South Dakota.

During Year 1, large bird use was highest during spring (30.43 birds800-m plot/20-min survey), whereas small bird use was highest during fall (15.71 birds/100-m plot/20-min survey; Appendix C1). Annual mean diurnal raptor use during Year 1 was 0.31 raptors/800-m plot/20-min survey with the highest mean use during the fall (0.52; Appendix C1). Four bald eagles were observed during the Year 1 fixed-point avian use surveys (Appendix C1). Eagles were observed for 15 min of which 11 min were risk minutes (eagles flew below 200 m above ground level and within 800 m of the observer; Appendix C1). Three other bald eagles were observed incidentally.

Year 2 avian use was similar to Year 1 for large and small birds; however, more eagles were observed during Year 2. Large bird use was highest during spring (36.38 birds/800-m plot/20-min survey), whereas small bird use was highest during fall (35.73 birds/100-m plot/20-min survey; Appendix C2). Annual mean diurnal raptor use was 0.33 raptors/800-m plot/20-min survey during Year 2 with the highest mean diurnal raptor use during fall (0.55; Appendix C2). Twenty bald eagles and one unidentified eagle were observed during Year 2 fixed-point avian use surveys. Bald eagles were observed for 135 min of which 70 min were risk minutes; the unidentified eagle was observed for eight minutes, all of which were risk minutes (Appendix C2). Most of the observations (nine) and minutes (72 total and 43 risk minutes) came from survey point nine during the spring migration on March 9, 2017. One golden eagle was observed incidentally during Year 2. Further detailed information pertaining specifically to eagles is discussed in the Eagle Conservation Plan developed for the Project.

Mean raptor use during Year 1 was compared with other wind energy facilities that implemented similar protocols and had data covering similar seasons, ranking 34th from the highest use compared to 47 other wind energy facilities in North America (Appendix C1). Mean raptor use during Year 2 ranked 33rd from the highest use compared to the other 47 wind energy facilities in North America (Appendix C2). Publicly available data containing both mean raptor use and raptor fatality information in the Midwest are scarce, while data having this information for four seasons is even rarer. Annual raptor use at the adjacent Beethoven Wind Energy Project (Beethoven; an operating wind energy facility immediately north of the Project area) was 0.10 raptors/plot/20-min survey (WEST 2015). Raptor fatality rates reported at other South Dakota wind energy facilities have ranged from 0–0.20 fatalities/MW/year. At the Grand Ridge I Project in Illinois, mean raptor use was 0.20 raptors/800-m plot/20-min survey, and no raptor fatalities were recorded (Derby et al. 2010a). Raptor fatality rates throughout the Midwest have ranged from zero at numerous facilities to 0.47 fatalities/MW/year at Buffalo Ridge, Phase I (Johnson et al. 2000a).

2.2.3 Raptor Nest Surveys

The objective of the raptor nest surveys was to locate and record raptor nests that may be subject to disturbance and displacement effects by wind energy facility construction and operation. As part of agency-approved baseline survey efforts, aerial surveys for raptor nests were completed in 2015 and 2016 by a qualified biologist before leaf out when raptors would be actively tending to a nest or incubating eggs (Derby 2015, 2016a); Appendices D1 and D2). Aerial surveys were conducted in accordance with the guidance provided in the USFWS Inventory and Monitoring Protocols (Pagel et al. 2010) and focused on locating large, stick nest structures in suitable raptor nesting substrate (trees, transmission lines, cliff faces, etc.) within the proposed Project and a 1.6-km (1-mi) buffer. Additionally, a second buffer was surveyed out to 16.1 km (10 mi) beyond the Project boundary to document any eagle nests.

Nests were classified as "occupied" if any of the following were observed at the nest structure: 1) an adult in an incubating position; 2) eggs; 3) nestlings or fledglings; 4) occurrence of a pair of adults (or, sometimes sub-adults); 5) a newly constructed or refurbished stick nest in the area where territorial behavior of a raptor was observed or had been observed early in the breeding season; or 6) a recently repaired nest with fresh sticks (clean breaks) or fresh boughs on top, and/or droppings and/or molted feathers on its rim or underneath. A nest that did not meet the above criteria for "occupied" was classified as "unoccupied".

During April 11, 12, and 15, 2015, 71 raptor nests representing three species were documented within the Project area and 16.1 km (10.0 mi) buffer (Figure 7; Derby 2015; Appendix D1). No bald eagle nests were located within the Project area, but eight bald eagle nests (seven occupied and one unoccupied) were documented during the survey (Figure 7). The closest bald eagle nest was observed approximately 0.8 km (0.5 mi) north of the 2015 Project boundary. Three of the seven active bald eagle nests observed in 2015 corresponded to known historic nest locations (PW-EN2, PW-EN3, PW-EN6; Figure 7). Additionally, three occupied great horned owl (*Bubo virginianus*) and five red-tailed hawk (*Buteo jamaicensis*) nests were recorded during raptor nest surveys conducted in 2015.

During the April 21, 2016, aerial raptor nest survey, 50 occupied and/or unoccupied raptor nests representing three species were documented within the Project area and associated 16.1- km (10-mi) buffer (Figure 7 and 8; Appendix D2). No eagle nests were documented within the Project area, but six eagle nests (three unoccupied and three occupied) were located during the 2016 survey (Figure 8); three of these were known historic bald eagle nests (PW-EN1, PW-EN2, PW-EN6). The closest active bald eagle nest was observed approximately 0.8 km (0.5 mi) from the 2016 Project boundary (Figure 8). Other raptor species identified during aerial raptor nest surveys conducted in 2016 included three occupied great horned owl nests and ten occupied red-tailed hawk nests (Figure 8); additionally, 31 unknown raptor nests (two occupied; 29 unoccupied) were documented during the 2016 survey (Derby 2016a; Appendix D2).

Available upon request.

Available upon request.

2.2.4 Acoustic Bat Surveys

No general bat survey was conducted within the Project area during Tier 3 surveys; however, an acoustic bat survey was completed by WEST at Beethoven, located north and adjacent to the Project area, in 2014. Bat surveys at Beethoven recorded an average of 11.49±5.36 bat passes per detector-night (WEST 2015). For all detector locations, 85.4% of bat passes were classified as low-frequency (e.g., big brown bats [*Eptesicus fuscus*], hoary bats [*Lasiurus cinereus*], and silver-haired bats [*Lasionycteris noctivagans*]), while only 14.6% were classified as high frequency (e.g., eastern red bats [*Lasiurus borealis*] and *Myotis* species); summer bat activity at Beethoven was higher than fall bat activity with peak activity the week of July 7 – July 14, 2014 (WEST 2015).

As a means to compare bat activity rates across projects with different sampling periods as well as to compare rates during what historically has been the period of higher fatality rates, WEST uses a standardized “fall migration period” in reviewing bat activity rates. The pre-construction bat activity rate recorded by ground detectors at Beethoven during the fall migration period (2.04±0.99 bat passes per detector-night; WEST 2015) was very low compared to activity rates at other facilities in the Midwest (Table 5), and throughout North America, from studies conducted with similarly-collected data. Bat activity rates are not available for other wind energy projects in North and South Dakota (Table 5). Reported bat fatality rates at Beethoven (2.69 bats/MW/year; WEST 2016) were within the range of other regional projects in the Midwest region of North America, where reported bat fatalities have ranged from 0.16–2.81 bat fatalities/MW/year (Table 5). Based on the location of the Project, habitats present, activity rates recorded during studies at nearby Beethoven, and bat fatality rates at Beethoven and other Midwest wind energy facilities, estimated direct impacts to bats at the Project is expected to be similar to Beethoven and low compared to bat fatality rates at other projects across the country.

Table 5. Wind energy facilities in the Midwest with comparable activity and fatality data for bats.

Wind Energy Facility	Bat Activity Estimate[A]	Bat Activity Dates	Fatality Estimate[B]	Number of Turbines	Total Megawatts
Cedar Ridge, WI (2009)	9.97[C,D,E,F]	7/16/07-9/30/07	30.61	41	67.60
Blue Sky Green Field, WI (2008; 2009)	7.70[d]	7/24/07-10/29/07	24.57	88	145.00
Cedar Ridge, WI (2010)	9.97[C,D,E,F]	7/16/07-9/30/07	24.12	41	68.00
Fowler I, II, III, IN (2011)			20.19	355	600.00
Fowler I, II, III, IN (2010)			18.96	355	600.00
Forward Energy Center, WI (2008-2010)	6.97	8/5/08-11/08/08	18.17	86	129.00
Harrow, Ont (2010)			11.13	24 (four 6-turb facilities)	39.60
Top of Iowa, IA (2004)	35.70	5/26/04-9/24/04	10.27	89	80.00
Pioneer Prairie I, IA (Phase II; 2011-2012)			10.06	62	102.30
Fowler I, IN (2009)			8.09	162	301.00
Crystal Lake II, IA (2009)			7.42	80	200.00
Top of Iowa, IA (2003)			7.16	89	80.00
Kewaunee County, WI (1999-2001)			6.45	31	20.46
Ripley, Ont (2008)			4.67	38	76.00
Winnebago, IA (2009-2010)			4.54	10	20.00
Buffalo Ridge, MN (Phase II; 2001/Lake Benton I)	2.20[c]	6/15/01-9/15/01	4.35	143	107.25
Buffalo Ridge, MN (Phase III; 2001/Lake Benton II)	2.20[c]	6/15/01-9/15/01	3.71	138	103.50
Crescent Ridge, IL (2005-2006)			3.27	33	49.50
Fowler I, II, III, IN (2012)			2.96	355	600.00
Elm Creek II, MN (2011-2012)			2.81	62	148.80
Buffalo Ridge II, SD (2011-2012)			2.81	105	210.00
Buffalo Ridge, MN (Phase III; 1999)			2.72	138	103.50
Buffalo Ridge, MN (Phase II; 1999)			2.59	143	107.25
Moraine II, MN (2009)			2.42	33	49.50
Buffalo Ridge, MN (Phase II; 1998)			2.16	143	107.25
PrairieWinds ND1 (Minot), ND (2010)			2.13	80	115.50
Grand Ridge I, IL (2009-2010)			2.1	66	99.00
Barton I & II, IA (2010-2011)			1.85	80	160.00
Fowler III, IN (2009)			1.84	60	99.00
Buffalo Ridge, MN (Phase III; 2002/Lake Benton II)	1.90[C]	6/15/02-9/15/02	1.81	138	103.50
Buffalo Ridge, MN (Phase II; 2002/Lake Benton I)	1.90[C]	6/15/02-9/15/02	1.64	143	107.25
Rugby, ND (2010-2011)			1.60	71	149.00
Elm Creek, MN (2009-2010)			1.49	67	100.00
Wessington Springs, SD (2009)			1.48	34	51.00
PrairieWinds ND1 (Minot), ND (2011)			1.39	80	115.50

Table 5. Wind energy facilities in the Midwest with comparable activity and fatality data for bats.

Wind Energy Facility	Bat Activity Estimate[A]	Bat Activity Dates	Fatality Estimate[B]	Number of Turbines	Total Megawatts
PrairieWinds SD1, SD (2011-2012)			1.23	108	162.00
NPPD Ainsworth, NE (2006)			1.16	36	20.50
PrairieWinds SD1, SD (2012-2013)			1.05	108	162.00
Buffalo Ridge, MN (Phase I; 1999)			0.74	73	25.00
Wessington Springs, SD (2010)			0.41	34	51.00
Buffalo Ridge I, SD (2009-2010)			0.16	24	50.40

[A]. = Bat passes per detector-night.

[B]. = Number of fatalities per megawatt per year.

[C]. = Activity rate was averaged across phases and/or years.

[D]. = Activity rate based on pre-construction monitoring; data for all other activity and fatality rates were collected concurrently.

[E]. = Activity rate calculated by WEST from data presented in referenced report.

[F]. = Activity rate based on data collected at various heights all other activity rates are from ground-based units only.

Data from the following sources:

Wind Energy Facility	Activity Reference	Fatality Reference	Wind Energy Facility	Activity Reference	Fatality Reference
Barton I & II, IA (10-11)		Derby et al. 2011b	Fowler I, II, III, IN (10)		Good et al. 2011
Blue Sky Green Field, WI (08; 09)	Gruver 2008	Gruver et al. 2009	Fowler I, II, III, IN (11)		Good et al. 2012
Buffalo Ridge, MN (Phase I; 99)		Johnson et al. 2000b	Fowler I, II, III, IN (12)		Good et al. 2013
Buffalo Ridge, MN (Phase II; 98)		Johnson et al. 2000b	Grand Ridge I, IL (09-10)		Derby et al. 2010a
Buffalo Ridge, MN (Phase II; 99)		Johnson et al. 2000b	Harrow, Ont (10)		NRSI 2011
Buffalo Ridge, MN (Phase II; 01/Lake Benton I)	Johnson et al. 2004	Johnson et al. 2004	Kewaunee County, WI (99-01)		Howe et al. 2002
Buffalo Ridge, MN (Phase II; 02/Lake Benton I)	Johnson et al. 2004	Johnson et al. 2004	Moraine II, MN (09)		Derby et al. 2010e
Buffalo Ridge, MN (Phase III; 99)		Johnson et al. 2000b	NPPD Ainsworth, NE (06)		Derby et al. 2007
Buffalo Ridge, MN (Phase III; 01/Lake Benton II)	Johnson et al. 2004	Johnson et al. 2004	Pioneer Prairie I, IA (Phase II; 11-12)		Chodachek et al. 2012
Buffalo Ridge, MN (Phase III; 02/Lake Benton II)	Johnson et al. 2004	Johnson et al. 2004	PrairieWinds ND1 (Minot), ND (10)		Derby et al. 2011d
Buffalo Ridge I, SD (09-10)		Derby et al. 2010c	PrairieWinds ND1 (Minot), ND (11)		Derby et al. 2012e
Buffalo Ridge II, SD (11-12)		Derby et al. 2012a	PrairieWinds SD1 (Crow Lake), SD (11-12)		Derby et al. 2012c
Cedar Ridge, WI (09)	BHE Environmental 2008	BHE Environmental 2010	PrairieWinds SD1 (Crow Lake), SD (12-13)		Derby et al. 2013
Cedar Ridge, WI (10)	BHE Environmental 2008	BHE Environmental 2011	Ripley, Ont (08)		Jacques Whitford 2009
Crescent Ridge, IL (05-06)		Kerlinger et al. 2007	Rugby, ND (10-11)		Derby et al. 2011c
Elm Creek, MN (09-10)		Derby et al. 2010d	Top of Iowa, IA (03)		Jain 2005
Elm Creek II, MN (11-12)		Derby et al. 2012b	Top of Iowa, IA (04)	Jain 2005	Jain 2005
Forward Energy Center, WI (08-10)	Watt and Drake 2011	Grodsky and Drake 2011	Wessington Springs, SD (09)		Derby et al. 2010b
Fowler I, IN (09)		Johnson et al. 2010a	Wessington Springs, SD (10)		Derby et al. 2011a
Fowler III, IN (09)		Johnson et al. 2010b	Winnebago, IA (09-10)		Derby et al. 2010g

2.2.5 Northern Long-Eared Bat Presence/Absence Surveys

In 2015, the northern long-eared bat was listed as federally threatened. During the summers of 2015 and 2016, acoustic surveys were implemented at the Project to determine the probable presence/absence of the species within the Project area (Derby et al. 2016, Derby 2017; Appendices E1 and E2). Surveys were conducted following the survey recommendations found in the USFWS's *Northern Long-eared Bat Interim Conference and Planning Guidance* and *2015 Range-Wide Indiana Bat Summer Survey Guidelines* (USFWS (USFWS 2014, 2015a, 2016). Consistent with survey guidelines and based on total wooded acres within the Project area as defined in 2015 (total of 477.5 ha [1,180 ac] of woodland), acoustic surveys were completed at 20 locations (two detector stations per site) for a total of 104 detector nights (Derby et al. 2016; Appendix E1) from July 21 – August 10, 2015 (Figure 10). Presence/absence surveys conducted in the summer of 2016 were based on the Project boundary as provided by Prevailing Winds, LLC in 2016. Based on this redefined boundary, there were approximately 178 ha (440 ac) of wooded habitat within the Project boundary (Table 1); therefore, eight locations were surveyed for two nights each, for a total of 16 detector-nights, from July 12 – August 4 (Figure 10; Derby 2017).

Based on the Bat Call Identification (Allen 2012) analysis, in 2015, nine locations recorded potential northern long-eared bat calls with a p-value less than 0.05 for the maximum-likelihood estimation; therefore, data from these nine stations were included in qualitative analysis (USFWS 2014, Derby et al. 2016). Qualitative identification verified the presence of northern long-eared bats at one station on six nights and at another station on one night; however, qualitative analysis did not verify the presence of this bat species at the remaining seven stations with probable northern long-eared bat calls (Appendix E1). Based on echolocation call analysis, using Kaleidoscope version 4.0.0 (Wildlife Acoustics 2017) and qualitative identification, following the acoustic survey guidelines issued by the USFWS (2016), no northern long-eared bat calls were recorded during the 2016 survey (Derby 2017; Appendix E2).

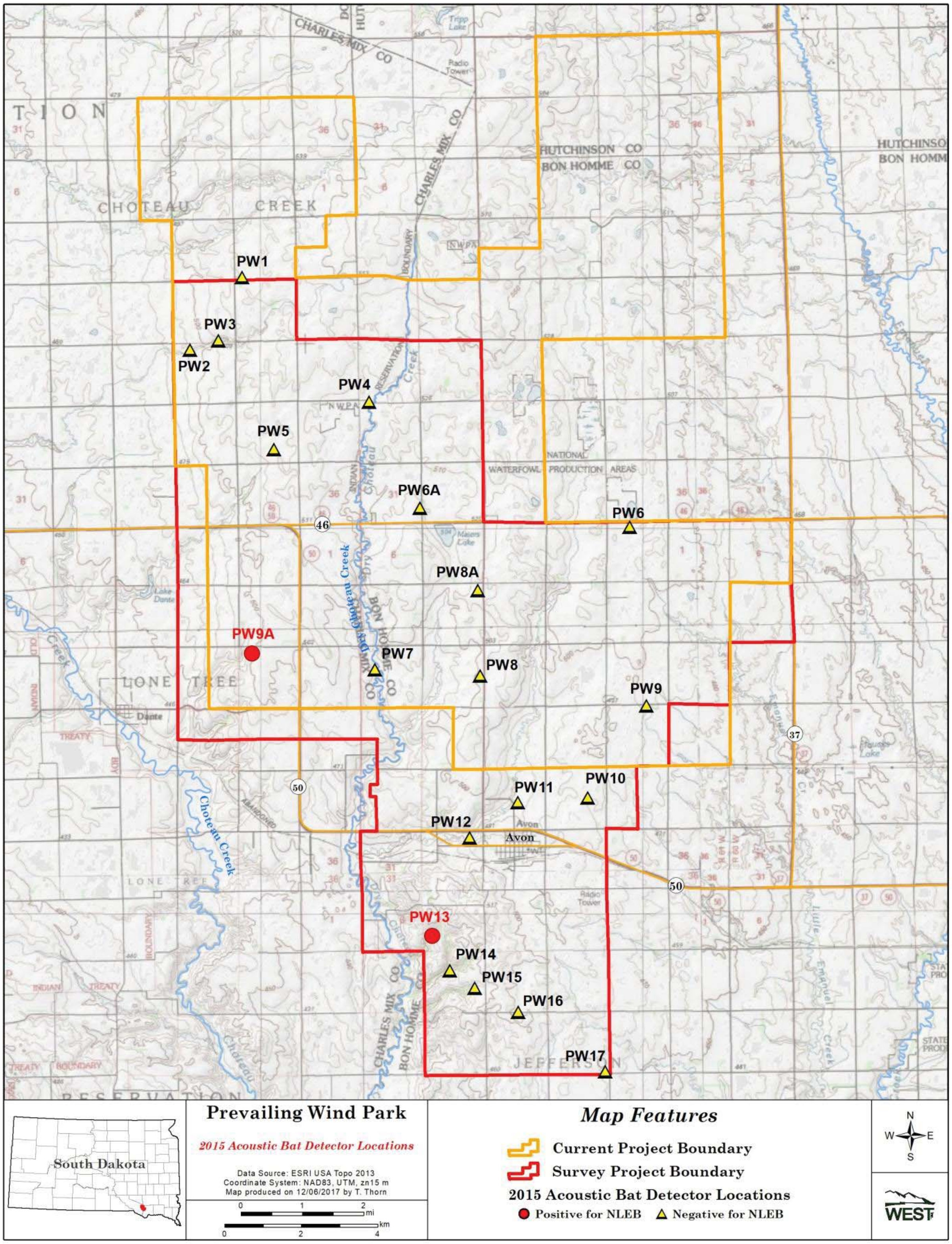

Figure 9. Locations of acoustic bat detectors and those confirmed positive for northern long-eared bats during acoustic surveys conducted in 2015 at the Prevailing Wind Park Project in Bon Homme, Hutchinson, and Charles Mix counties, South Dakota.

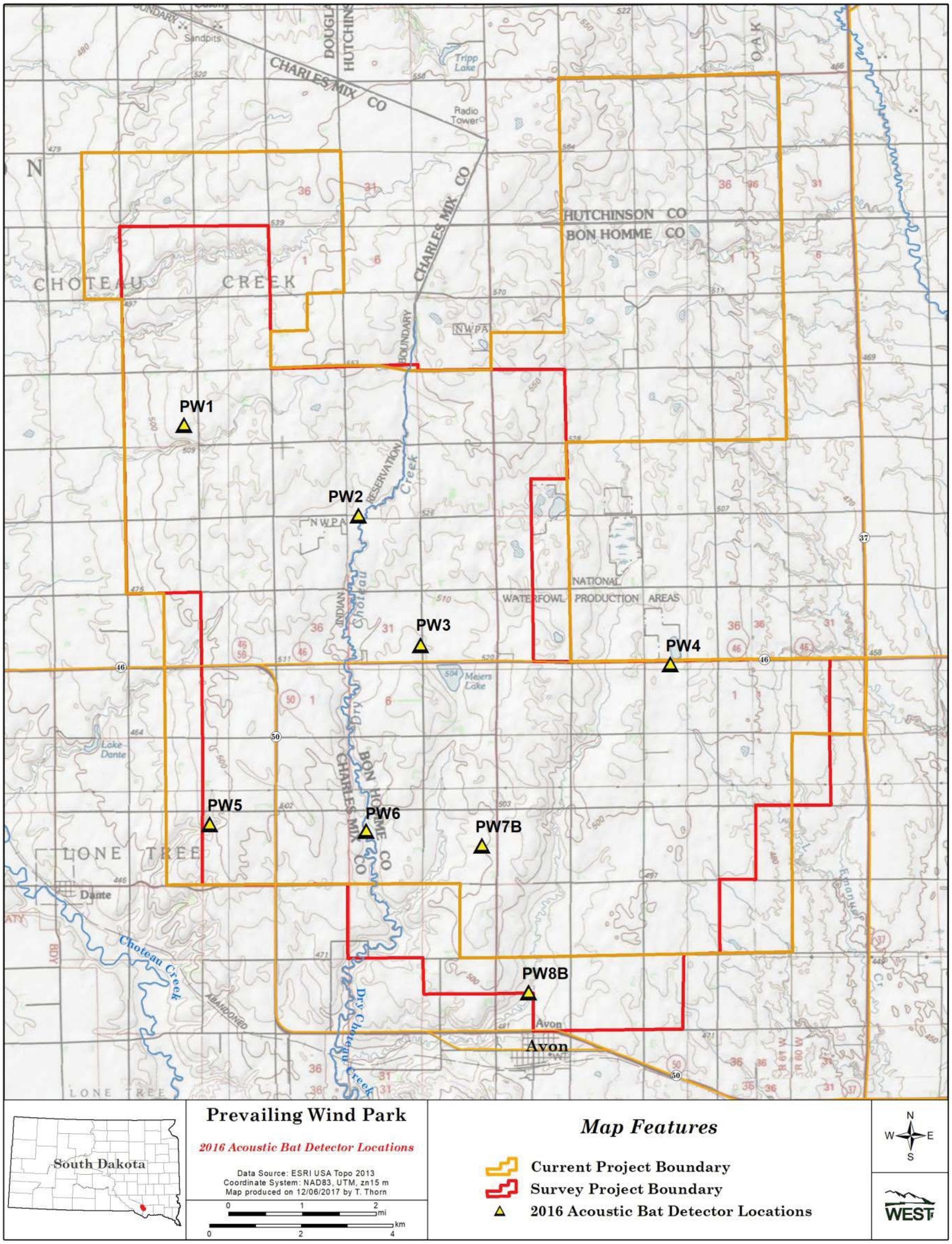

Figure 10. Locations of acoustic bat detectors during acoustic surveys conducted in 2016 at the Prevailing Wind Park Project in Bon Homme, Hutchinson, and Charles Mix counties, South Dakota.

2.2.6 Summary of Tier 3 Questions

1. *Do field studies indicate that species of concern are present on or likely to use the proposed site?*

While there is whooping crane habitat available within the Project area, the Project area does not have unique features compared to the surrounding landscape. Due to the close proximity of the Project to the whooping crane corridor, whooping cranes could potentially migrate through the Project area. Bald eagles nests were observed during spring surveys and individuals were observed during fixed-point counts in spring, fall, and winter, indicating eagles may utilize the Project area year-round; additionally, one golden eagle was observed incidentally during Year 2 surveys. One state-listed bird species (peregrine falcon) was observed during avian use surveys conducted at the Project and several special status bird species, including ferruginous hawk (*Buteo regalis*) and Swainson's hawk (*Buteo swainsoni*) were observed during these surveys. The federally threatened northern long-eared bat was recorded in two locations during the 2015 acoustic survey, but none were found during surveys in 2016, including at one point where one call was classified as a NLEB in 2015.

2. *Do field studies indicate potential for significant adverse impacts on the affected populations of species of habitat fragmentation concern?*

Approximately 42% of the Project area is composed of grassland/pasture land that may contain native grasses. If construction takes place in grassland areas, it is possible that some grassland and/or shrub-dependent species could be displaced. Grassland dependent species observed during fixed-point avian use surveys and incidentally included ferruginous hawk, golden eagle, and bobolink (*Dolichonys oryzivorous*). Project development is being planned to minimize impacts and disturbances to grasslands by siting in cropland to the greatest extent practicable.

3. *What is the distribution, relative abundance, behavior, and site use of species of concern identified in Tiers 1 or 2, and to what extent do these factors expose these species to risk from the proposed Project?*

No whooping cranes have been observed in the Project area. Site-specific data indicate whooping cranes may migrate over the Project, but site characteristics are similar to the surrounding area. Although large groups of sandhill cranes (*Antigone canadensis*) were observed incidentally during both years of fixed-point avian use surveys at the Project; no whooping cranes were observed during baseline studies. No sandhill or whooping cranes have been reported as fatalities from wind energy centers within the migration corridor; therefore impacts to whooping cranes are expected to be low (Derby et al. 2012d). One juvenile peregrine falcon, a state-listed species, was observed using grassland habitats within the Project area. Peregrine falcons have been reported in the general region where the Project is located and negative impacts from Project development are not expected due to the lack of suitable nesting habitat for this species.

The Canada goose (*Branta canadensis*), European starling (*Sturnus vulgaris*), sandhill crane, Franklin's gull (*Leucophaeus pipixcan*), snow goose (*Chen caerulescens*), common grackle (*Quiscalus quiscula*), and red-winged blackbird (*Agelaius phoeniceus*) were observed most often during Years 1 and 2 fixed-point avian use surveys. None of the above species are listed as federal or state-threatened or endangered. However, bald and golden eagles, both protected by the BGEPA, were observed during surveys and incidentally. Impacts are expected to be low for migratory bird species and population-level impacts are not expected.

While eagles are known to nest in the immediate area, no eagle nests were observed within the Project area. One eagle nest is within 1.6 km (1 mile) of the current Project boundary and approximately 3.2 km (2 mile) from the nearest turbine. Due to the proximity of the eagle nest, eagle use of the Project area is possible. Other eagle nests have been documented south of the Project along the Missouri River, and those individuals may utilize resources in the Project. Bald eagles were observed in spring, fall, and winter; however, eagle use of the Project was low.

As described in previous sections, northern long-eared bats were detected in two locations during acoustic surveys conducted in 2015, but were not detected during 2016 surveys.

4. *What are the potential risks of adverse impacts of the proposed Project to individuals and local populations of species of concern and their habitats?*

Where practicable, Project siting has avoided grasslands to limit impacts to wildlife species. Non-cropland vegetation may need to be cleared for construction of facilities, but habitat impacts are not expected to be significant. Most turbines will be located in cropland, which is of low habitat value for most wildlife species. The most likely impacts would be to individual birds and bats that may collide with wind turbines or other Project facilities; however, significant adverse impacts are not anticipated.

5. *How can developers mitigate identified significant adverse impacts?*

No significant impacts to species of concern are expected. Placement of turbines in cultivated crop fields and away from forested and native grassland areas will minimize impacts to sensitive bird and bat species. Project design alterations and best management practices have been developed based on the results from Tier 3 studies, information available in the WEG, and other studies at wind energy facilities. These steps to avoid and reduce impacts are described in Section 3 below.

6. *Are there studies that should be initiated at this stage that would be continued in either Tier 4 or Tier 5?*

Prevailing Wind plans to conduct Tier 4 post-construction monitoring studies for the Project as detailed in Section 4.

2.2.7 Summary of Potential Adverse Impacts

Overall impacts to bird species are expected to be low. The Project is located within a mix of grass/pasture land and cropland. Placement of turbines in grasslands or pasture lands could displace grassland-dependent species and other bird species that can occur in large blocks of grassland. Placement of turbines within mostly cultivated crop fields will limit impacts on birds and displacement of nesting birds.

Whooping cranes may utilize the Project area; however, no whooping or sandhill crane fatalities have been recorded at wind energy facilities in the migratory corridor and no impacts to whooping cranes are expected (Derby et al. 2012d). Overall diurnal raptor use was relatively low throughout the Project area during Years 1 and 2 (0.31 and 0.33 raptors/800-m plot/20-min survey, respectively) and pre-construction raptor use data is shown to generally correlate with post-construction raptor fatality rates at other wind energy projects. Post-construction monitoring at existing wind energy facilities in South Dakota has indicated that impacts to raptors in the region are low; therefore, impacts to raptors are likely to be low at the Project. Bald eagles were observed within the Project area during both years; however more eagles were observed during Year 2. One active bald eagle nest was located 1.6 km (1 mi) east of the Project boundary or 3.2 km (2 mi) from nearest turbine and other bald eagle nests were located within 16.1 km (10 mi) of the Project. Observed eagle use was low within the Project area which suggests minimal potential impacts to eagles.

Based on the Project's location in an agricultural setting, any impacts to bat species will likely be low and fall within the range of other wind energy projects in North and South Dakota and the Midwest region. However, it is difficult to predict what the actual level of bat mortality may be. Based on the location of the Project, limited bat roosting habitat, low bat activity recorded during acoustic surveys, and fatality data from other facilities close to the Project area, low levels of bat mortality could occur from the Project, and significant adverse impacts are not anticipated. The post-construction fatality monitoring surveys planned for the Project (see Section 4) are designed to provide empirical data on actual bat fatalities that can be compared to the pre-construction survey data.

3.0 POST-CONSTRUCTION: TIER 4

According to the WEG, "during post-construction tiers (including Tier 4), developers are assessing whether actions taken in earlier tiers to avoid and minimize impacts are successfully achieving the goals and, when necessary, taking additional steps to compensate for impacts" (USFWS 2012). The specific questions to be investigated in Tier 4 are:

- What are the bird and bat fatality rates within the Project area?
- What are the fatality rates of species of concern?
- How do the estimated fatality rates compare to the predicted fatality rates?
- Do bird and bat fatalities vary within the Project area in relation to site characteristics?

- How do the bird and bat fatality rates compare to the fatality rates from existing projects in similar landscapes with similar species composition and use?
- What is the composition of fatalities in relation to migrating and resident birds and bats at the Project?
- Do fatality data suggest the need for measures to reduce Project impacts?

After the field surveys and analysis are completed in accordance with the protocol described below, Prevailing Wind will review the efforts and make a determination pursuant to the WEG “Decision Framework for Tier 4a Fatality Monitoring” (USFWS 2012) to determine the need for further monitoring or if any measures are needed to reduce impacts.

3.1 Formal Avian and Bat Fatality Monitoring

Prevailing Wind has developed a post-construction monitoring plan with the intent to focus on the WEG Tier 4a questions for the Project. Fatality monitoring will provide information on the impact of the Project on birds and bats and give an indication of whether any specific turbines or Project facilities are responsible for a significant proportion of fatalities. As pre-construction surveys did not indicate significant potential impacts for birds or bats, current plans for the post-construction fatality monitoring are to conduct one year of general bird and bat fatality monitoring.

Fatality monitoring will begin after all the turbines have been commissioned and are fully operational, and will be conducted by a third party biologist. The duration and intensity of carcass searches, the number of selected turbines, and the levels of searcher efficiency and carcass removal trials will be consistent with general wind industry standard practices as described in the WEG. Impacts to avian and bat species are anticipated to be within the overall range of other Midwestern facilities, particularly those within North and South Dakota. The objective of the monitoring will be to determine if the avian or bat fatality rates are lower, similar to, or higher than other regional and national studies.

Fatality monitoring procedures will consist of the following components: 1) standardized carcass searches of selected turbines and/or turbine pads and roads, 2) searcher efficiency trials to estimate the percentage of carcasses found by searchers, and 3) carcass removal trials to estimate the length of time that a carcass remains in the field for possible detection. Fatality estimates for the monitoring period will be provided for a minimum of three categories: 1) bats, 2) all birds, and 3) raptors. The primary purpose of the proposed fatality monitoring is to document bat fatalities and large bird (e.g., raptor) fatalities.

Estimates of facility-related fatalities will be based on:

- Observed number of carcasses found during standardized searches during the monitoring year, for which the cause of death is either unknown or is probably facility-related.

- Non-removal rates, expressed as the estimated average probability a carcass is expected to remain in the study area and be available for detection by the searchers during removal trials.
- Searcher efficiency, expressed as the proportion of planted carcasses found by searchers during searcher efficiency trials.
- Percent of area searched at each turbine (i.e., takes into consideration road and pad sampling) and percentage of carcasses found at varying distances from turbine.

3.2 Incidental Monitoring

3.2.1 On-Site Staff Training

All operations personnel will be trained to identify potential wildlife interactions and the proper response. An incidental reporting process will be developed for operations personnel ensuring they can document bird or bat casualties within the Project area during routine maintenance work and at other times. In addition to incidental fatality reporting, operations personnel will be trained to identify bald and golden eagles, to be sensitive to relative use rates of eagles, and to look for eagle casualties while driving between turbines and conducting turbine maintenance.

3.2.2 Injured Wildlife Handling and Reporting Protocol

Any injured wildlife observed during operations of the Project will be left in place until Prevailing Wind's primary biological/ecological representative has been contacted. Prevailing Wind will then decide the most appropriate course of action depending on the condition and species of injured animal discovered. All injured native birds, including federally or state-listed species, will be promptly delivered to the appropriate rehabilitation center or other approved facility as specified in state and federal permits; or as directed by necessary law enforcement personnel.

3.3 Post-Construction Results and Recommendations Reporting Protocol

Prevailing Wind will prepare a report summarizing the results of the monitoring and assessment completed, as described in Sections 3.1 and 3.2.

Specific to the formal avian and bat fatality monitoring, this report will include turbine-specific information on found carcasses, along with estimated fatality rates for birds and bats. Fatality estimates will be calculated for bats, all birds, and raptors, at a minimum. Seasonal estimates for both birds and bats will also be reported. Estimated fatality rates will be calculated using the total number of carcasses found, along with data from searcher efficiency and carcass removal trials. The report will include an analysis that provides a comparison of fatality estimates, searcher efficiency, and scavenger removal rates between the cleared plots and road and pad searches. All species found as fatalities will be reported and if any federally listed or state-listed species are found they will be reported immediately to the proper agency personnel.

4.0 RESEARCH: TIER 5

In addition to the Tiers 1–4 described above, the WEG contain a Tier 5 *"Other Post-Construction Studies*" section. In general, the studies identified in Tier 5 are research-related and "will not be necessary for most wind energy projects" (USFWS 2012). Given that the Project's pre-construction studies indicate that the Project is not likely to cause significant adverse impacts, no Tier 5 studies are planned.

5.0 ADAPTIVE MANAGEMENT AND OPERATIONS MEASURES

Within the WEG, the Department of the Interior defines adaptive management as "an iterative decision process that promotes flexible decision-making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Comprehensively applying the tiered approach embodies the adaptive management process" (USFWS 2012). The WEG further note that adaptive management at most wind energy facilities is unlikely to be needed if they are sited in accordance with the tiered approach. Nevertheless, Prevailing Wind recognizes the value of applying this approach to its Project activities that include some uncertainty. As such, Prevailing Wind has incorporated an adaptive approach for the conservation of wildlife potentially impacted by the Project.

Section 2.0 of this BBCS describes the tiered approach used to study wildlife conditions and predict Project impacts. Based on Project siting, response to pre-construction monitoring actions (turbines sited mostly in cultivated areas), and results to date of overall biological monitoring, the anticipated bat and bird mortality is expected to be within the overall range for other projects in the region and no significant adverse impacts on birds and bats are anticipated from the Project. Estimated avian and bat fatality rates reported at the nearby Beethoven were 2.69 bat fatalities/MW/study period, 1.43 bird fatalities, and 0.07 raptor fatalities. Additional available studies from Midwestern projects have reported estimated fatality rates ranging from 0.16–2.81 bats/MW/year (Table 5), 0.27–8.25 birds/MW/year (Table 6), and 0–0.47 raptors/MW/year (Table 7). To confirm the anticipated impacts, post-construction fatality surveys will be conducted after the facility is fully functioning, using a third party biologist according to the methods set forth in Section 3.

Table 6. Wind energy facilities in the Midwest with fatality data for all bird species.

Wind Energy Facility	Fatality Estimate[A]	Number of Turbines	Total Megawatts
Wessington Springs, SD (2009)	8.25	34	51.00
Blue Sky Green Field, WI (2008; 2009)	7.17	88	145.00
Cedar Ridge, WI (2009)	6.55	41	67.60
Buffalo Ridge, MN (Phase III; 1999)	5.93	138	103.50
Moraine II, MN (2009)	5.59	33	49.50
Barton I & II, IA (2010-2011)	5.5	80	160.00
Buffalo Ridge I, SD (2009-2010)	5.06	24	50.40
Buffalo Ridge, MN (Phase I; 1996)	4.14	73	25.00

Table 6. Wind energy facilities in the Midwest with fatality data for all bird species.

Wind Energy Facility	Fatality Estimate[A]	Number of Turbines	Total Megawatts
Winnebago, IA (2009-2010)	3.88	10	20.00
Rugby, ND (2010-2011)	3.82	71	149.00
Cedar Ridge, WI (2010)	3.72	41	68.00
Elm Creek II, MN (2011-2012)	3.64	62	148.80
Buffalo Ridge, MN (Phase II; 1999)	3.57	143	107.25
Buffalo Ridge, MN (Phase I; 1998)	3.14	73	25.00
Ripley, Ont (2008)	3.09	38	76.00
Fowler I, IN (2009)	2.83	162	301.00
Buffalo Ridge, MN (Phase I; 1997)	2.51	73	25.00
Buffalo Ridge, MN (Phase II; 1998)	2.47	143	107.25
PrairieWinds SD1, SD (2012-2013)	2.01	108	162.00
Buffalo Ridge II, SD (2011-2012)	1.99	105	210.00
Kewaunee County, WI (1999-2001)	1.95	31	20.46
NPPD Ainsworth, NE (2006)	1.63	36	20.50
PrairieWinds ND1 (Minot), ND (2011)	1.56	80	115.50
Elm Creek, MN (2009-2010)	1.55	67	100.00
PrairieWinds ND1 (Minot), ND (2010)	1.48	80	115.50
Buffalo Ridge, MN (Phase I; 1999)	1.43	73	25.00
PrairieWinds SD1, SD (2011-2012)	1.41	108	162.00
Wessington Springs, SD (2010)	0.89	34	51.00
Top of Iowa, IA (2004)	0.81	89	80.00
Grand Ridge I, IL (2009-2010)	0.48	66	99.00
Top of Iowa, IA (2003)	0.42	89	80.00
Pioneer Prairie I, IA (Phase II; 2011-2012)	0.27	62	102.30

[A]. = Number of bird fatalities per megawatt per year.

Data from the following sources:

Wind Energy Facility	Fatality Reference	Wind Energy Facility	Fatality Reference
Barton I & II, IA (10-11)	Derby et al. 2011b	Grand Ridge, IL (09-10)	Derby et al. 2010a
Blue Sky Green Field, WI (08; 09)	Gruver et al. 2009	Kewaunee County, WI (99-01)	Howe et al. 2002
Buffalo Ridge, MN (Phase I; 96)	Johnson et al. 2000b	Moraine II, MN (09)	Derby et al. 2010e
Buffalo Ridge, MN (Phase I; 97)	Johnson et al. 2000b	NPPD Ainsworth, NE (06)	Derby et al. 2007
Buffalo Ridge, MN (Phase I; 98)	Johnson et al. 2000b	Pioneer Prairie I, IA (Phase II; 11-12)	Chodachek et al. 2012
Buffalo Ridge, MN (Phase I; 99)	Johnson et al. 2000b	PrairieWinds ND1 (Minot), ND (10)	Derby et al. 2011d
Buffalo Ridge, MN (Phase II; 98)	Johnson et al. 2000b	PrairieWinds ND1 (Minot), ND (11)	Derby et al. 2012e
Buffalo Ridge, MN (Phase II; 99)	Johnson et al. 2000b	PrairieWinds SD1 (Crow Lake), SD (11-12)	Derby et al. 2012c
Buffalo Ridge, MN (Phase III; 99)	Johnson et al. 2000b	PrairieWinds SD1 (Crow Lake), SD (12-13)	Derby et al. 2013
Buffalo Ridge I, SD (09-10)	Derby et al. 2010c	Ripley, Ont (08)	Jacques Whitford 2009
Buffalo Ridge II, SD (11-12)	Derby et al. 2012a	Rugby, ND (10-11)	Derby et al. 2011c
Cedar Ridge, WI (09)	BHE Environmental 2010	Top of Iowa, IA (03)	Jain 2005
Cedar Ridge, WI (10)	BHE Environmental 2011	Top of Iowa, IA (04)	Jain 2005
Elm Creek, MN (09-10)	Derby et al. 2010d	Wessington Springs, SD (09)	Derby et al. 2010b
Elm Creek II, MN (11-12)	Derby et al. 2012b	Wessington Springs, SD (10)	Derby et al. 2011a
Fowler I, IN (09)	Johnson et al. 2010a	Winnebago, IA (09-10)	Derby et al. 2010f

Table 7. Wind energy facilities in the Midwest with fatality data for raptors.

Wind Energy Facility	Raptor Fatality Estimate[A]	Number of Turbines	Total Megawatts
Buffalo Ridge, MN (Phase I; 1999)	0.47	73	25.00
Moraine II, MN (2009)	0.37	33	49.50
Winnebago, IA (2009-2010)	0.27	10	20.00
Buffalo Ridge I, SD (2009-2010)	0.2	24	50.40
Cedar Ridge, WI (2009)	0.18	41	67.60
Top of Iowa, IA (2004)	0.17	89	80.00
Cedar Ridge, WI (2010)	0.13	41	68.00
Ripley, Ont (2008)	0.10	38	76.00
Wessington Springs, SD (2010)	0.07	34	51.00
NPPD Ainsworth, NE (2006)	0.06	36	20.50
Wessington Springs, SD (2009)	0.06	34	51.00
Rugby, ND (2010-2011)	0.06	71	149.00
PrairieWinds ND1 (Minot), ND (2011)	0.05	80	115.50
PrairieWinds ND1 (Minot), ND (2010)	0.05	80	115.50
PrairieWinds SD1, SD (2012-2013)	0.03	108	162.00
Kewaunee County, WI (1999-2001)	0	31	20.46
Buffalo Ridge, MN (Phase I; 1996)	0	73	25.00
Buffalo Ridge, MN (Phase I; 1997)	0	73	25.00
Buffalo Ridge, MN (Phase I; 1998)	0	73	25.00
Top of Iowa, IA (2003)	0	89	80.00
Grand Ridge I, IL (2009-2010)	0	66	99.00
Elm Creek, MN (2009-2010)	0	67	100.00
Pioneer Prairie I, IA (Phase II; 2011-2012)	0	62	102.30
Buffalo Ridge, MN (Phase III; 1999)	0	138	103.50
Buffalo Ridge, MN (Phase II; 1998)	0	143	107.25
Buffalo Ridge, MN (Phase II; 1999)	0	143	107.25
Blue Sky Green Field, WI (2008; 2009)	0	88	145.00
Elm Creek II, MN (2011-2012)	0	62	148.80
Barton I & II, IA (2010-2011)	0	80	160.00
PrairieWinds SD1, SD (2011-2012)	0	108	162.00
Buffalo Ridge II, SD (2011-2012)	0	105	210.00
Fowler I, IN (2009)	0	162	301.00

[A] = Number of raptor fatalities per megawatt per year

Data from the following sources:

Wind Energy Facility	Fatality Reference	Wind Energy Facility	Fatality Reference
Barton I & II, IA (10-11)	Derby et al. 2011b	Grand Ridge, IL (09-10)	Derby et al. 2010a
Blue Sky Green Field, WI (08; 09)	Gruver et al. 2009	Kewaunee County, WI (99-01)	Howe et al. 2002
Buffalo Ridge, MN (Phase I; 96)	Johnson et al. 2000b	Moraine II, MN (09)	Derby et al. 2010e
Buffalo Ridge, MN (Phase I; 97)	Johnson et al. 2000b	NPPD Ainsworth, NE (06)	Derby et al. 2007
Buffalo Ridge, MN (Phase I; 98)	Johnson et al. 2000b	Pioneer Prairie I, IA (Phase II; 11-12)	Chodachek et al. 2012
Buffalo Ridge, MN (Phase I; 99)	Johnson et al. 2000b	PrairieWinds ND1 (Minot), ND (10)	Derby et al. 2011d
Buffalo Ridge, MN (Phase II; 98)	Johnson et al. 2000b	PrairieWinds ND1 (Minot), ND (11)	Derby et al. 2012e
Buffalo Ridge, MN (Phase II; 99)	Johnson et al. 2000b	PrairieWinds SD1 (Crow Lake), SD (11-12)	Derby et al. 2012c
Buffalo Ridge, MN (Phase III; 99)	Johnson et al. 2000b	PrairieWinds SD1 (Crow Lake), SD (12-13)	Derby et al. 2013
Buffalo Ridge I, SD (09-10)	Derby et al. 2010c	Ripley, Ont (08)	Jacques Whitford 2009
Buffalo Ridge II, SD (11-12)	Derby et al. 2012a	Rugby, ND (10-11)	Derby et al. 2011c
Cedar Ridge, WI (09)	BHE Environmental 2010	Top of Iowa, IA (03)	Jain 2005
Cedar Ridge, WI (10)	BHE Environmental 2011	Top of Iowa, IA (04)	Jain 2005
Elm Creek, MN (09-10)	Derby et al. 2010d	Wessington Springs, SD (09)	Derby et al. 2010b
Elm Creek II, MN (11-12)	Derby et al. 2012b	Wessington Springs, SD (10)	Derby et al. 2011a
Fowler I, IN (09)	Johnson et al. 2010a	Winnebago, IA (09-10)	Derby et al. 2010f

5.1 Unexpected Avian, Bat, and/or Habitat Impacts

Based on the results of the Tier 4 monitoring program described in the sections above, adaptive management measures could be considered to further avoid, minimize, or compensate for unanticipated and significant Project impacts to wildlife. Examples for considering an adaptive response may include:

- Mortality of a bald or golden eagle (to be addressed via the Eagle Conservation Plan), northern long-eared bat, whooping crane or species listed as endangered/threatened under the federal ESA;
- Significant levels of mortality of non-listed species of birds or bats above those outlined in the tables above; or
- New occurrence of an eagle nest or listed species occupancy during operations.

Prevailing Wind would also consider adaptive management responses if additional species become listed under federal or state-protected species regulations.

6.0 IMPLEMENTATION OF THE BBCS

6.1 Document Availability

This BBCS will be maintained by Prevailing Wind's appropriate management staff member and a copy of the BBCS will be kept on-site throughout operations of the Project.

6.2 Reporting

In accordance with the BBCS, annual reports for post-construction Tier 4 efforts will be developed and submitted to appropriate agency representatives for review. Reporting of finding any listed species fatality will be done immediately to the USFWS for the life of the Project. Prevailing Wind will also coordinate any adaptive management changes needed with agency personnel.

7.0 REFERENCES

50 Code of Federal Regulations (CFR) § 22.26. 2009. Title 50 - Wildlife and Fisheries; Chapter I - United States Fish and Wildlife Service, Department of the Interior; Subchapter B - Taking, Possession, Transportation, Sale, Purchase, Barter, Exportation, and Importation of Wildlife and Plants; Part 22 - Eagle Permits; Subpart C - Eagle Permits; Section (§) 22.26 - Permits for Eagle Take That Is Associated with, but Not the Purpose of, an Activity. 50 CFR 22.26. [74 FR 46877, September 11, 2009, as amended at 79 FR 73725, December 9, 2013].

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APPENDIX M - SHADOW FLICKER ANALYSIS

Shadow Flicker Analysis

Prevailing Wind Park, LLC

Prevailing Wind Park
Project No. 105644

Revision 6a
10/04/2018

Shadow Flicker Analysis

prepared for

Prevailing Wind Park, LLC
Prevailing Wind Park
Bon Homme/Charles Mix/Hutchinson Counties, SD

Project No. 105644

Revision 6a
10/04/2018

prepared by

Burns & McDonnell Engineering Company, Inc.
Kansas City, Missouri

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LIST OF ABBREVIATIONS

Abbreviation	Term/Phrase/Name
Burns & McDonnell	Burns & McDonnell Engineering Company, Inc.
Developer	Prevailing Wind Park, LLC
GE	General Electric
kg/m^3	Kilograms per cubic meter
m/s	Meters per second
MW	Megawatt
Project	Prevailing Wind Park
Project Site	Location of Prevailing Wind Park in South Dakota
Study	Shadow Flicker Analysis

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REVISION HISTORY

Rev	Issue Date	Release Notes
0	03-Apr-2018	Original release
1	09-Apr-2018	Revised wind turbine layout, incorporated client comments
2	11-Apr-2018	Added REC-138
3	16-Apr-2018	Revised wind turbine layout
4	27-Apr-2018	Revised wind turbine layout
5	25-May-2018	Included obstacles at select locations; added participant status to receptors
5a	27-May-2018	Revised Table 3-1, added Table 3-2
5b	28-May-2018	Incorporated client comments
5c	29-May-2018	Incorporated client comments
6	03-Oct-2018	Updated for new turbine layout; added receptor locations; GE3.8-137 layout
6a	04-Oct-2018	Incorporated client comments

1.0 INTRODUCTION

1.1 Study Overview

Burns & McDonnell Engineering Company, Inc. ("Burns & McDonnell") was retained by Prevailing Wind Park, LLC ("Developer") to conduct a shadow flicker analysis (the "Study") for the proposed Prevailing Wind Park (the "Project"). The objective of the Study was to estimate the annual frequency of shadow flicker on occupied residences caused by Project wind turbines. No attempt was made in this Study to examine or opine on health effects related to shadow flicker.

1.2 Project Overview

The proposed Prevailing Wind Park will be located in Bon Homme, Charles Mix, and Hutchinson Counties in South Dakota, approximately 10 miles east of the town of Wagner and approximately 75 miles southwest of the city of Sioux Falls, South Dakota (the "Project Site"). The Project will consist of up to 61 wind turbines with a maximum nameplate capacity of up to 219.6 megawatts ("MW"), although output at the point of interconnection will be limited to a maximum of 200 MW. The General Electric ("GE") 3.8-137 with a 111.5-meter hub height turbine model was considered as part of this Study.

A map showing the general location and configuration of the Project Site is included as Appendix A. For purposes of this Study, a total of 62 turbine positions were evaluated, although only up to 61 turbines are expected to be installed.

1.3 Shadow Flicker Overview

Shadow flicker occurs when wind turbine blades pass in front of the sun to create recurring shadows on an object. Such shadows occur only under very specific conditions, including sun position, wind direction, time of day, and other similar factors.

The intensity of shadow flicker varies significantly with distance, and as separation between a turbine and receptor increases, shadow flicker intensity correspondingly diminishes. Shadow flicker intensity for distances greater than 10 rotor diameters (i.e., 1370 meters) is generally low and considered imperceptible. At such distances, shadow flicker is typically only caused at sunrise or sunset, when cast shadows are sufficiently long.

Shadow flicker impacts are not currently regulated in applicable state or federal law, nor are there requirements in the current Charles Mix County (SD) or Hutchinson County (SD) ordinances. Section 1741 of the Bon Homme County (SD) 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.*

In addition to providing the modeling results, this report identifies those receptors that may experience shadow flicker more than 30 hours per year and/or 30 minutes per day.

1.4 Site Visit

Burns & McDonnell visited the Project Site in September 2018 to visually confirm the location of occupied receptors for this Study. Beyond this visit, the contents of this evaluation are based exclusively upon desktop analysis by Burns & McDonnell.

2.0 MODELING PARAMETERS AND INPUTS

2.1 Modeling Overview

Shadow flicker was modeled at the Project Site using WindPRO, an industry-leading software package for the design and planning of wind energy projects. This package models the sun's path with respect to every turbine location during every minute over a complete year. Any shadow flicker caused by each turbine is then aggregated for each receptor for the entire year.

The following sections are summaries of the inputs utilized in the WindPRO model for this Study.

2.2 Turbine Coordinates

Shadow flicker intensity is partially dependent upon the distance from a receptor to the turbine causing the shadow. The Developer-provided coordinates of each turbine are presented in Appendix B, and the location of each turbine is presented graphically in Appendix A. For purposes of this Study, a total of 62 turbine positions were evaluated, although only up to 61 turbines are expected to be installed.

2.3 Turbine Dimensions

The size of a wind turbine, including both hub height and rotor diameter, contributes to the length and width of the shadows that may be cast by that turbine. The GE 3.8-137 wind turbine generators were each modeled with a rotor diameter of 137 meters and a hub height of 111.5 meters.

2.4 Receptors

A quantity of 149 receptors were modeled at the Project Site, including two (2) cemeteries. The coordinates of each receptor are presented in Appendix B and the location of each receptor is presented graphically in Appendix A. Coordinates for each receptor were provided by Developer, although Burns & McDonnell visited the Project Site in September 2018 to visually confirm the location of occupied receptors for this Study.

Each receptor was modeled in "green house" mode within the WindPRO model. This approach provides a conservative estimate of the amount of time when shadow flicker could occur by modeling each receptor as having windows on all sides and effectively causing the home to be susceptible to flicker effects in all directions.

2.5 Terrain

The WindPRO model utilizes topography data to place turbines and receptors at the proper elevations. This information is also used by the model to consider any natural land features between a turbine and a receptor that may block shadows from being seen at a receptor.

Publicly-available terrain data was downloaded from the National Elevation Dataset, a product of the United States Geological Survey. The 10-meter resolution digital elevation model DEM was exported at 10-foot intervals for use in the WindPRO model. Elevations were assigned by Burns & McDonnell to each turbine and each receptor using this data.

2.6 Obstacles

Obstacles located between a receptor and a turbine, such as trees or buildings, may significantly reduce or eliminate the duration and/or intensity of shadow flicker. Burns & McDonnell included obstacles in the WindPRO model, including trees and outbuildings, for only those receptors that exceeded 30 hours per year and/or 30 minutes per day. Such receptors are indicated by an asterisk (*) in Appendix B and Appendix F, respectively. No obstacles were considered or modeled for any other receptors.

WindPRO models obstacles utilizing a cubic volume, where each obstacle is assigned a height, width, depth, and porosity level. The obstacles near the applicable receptors were reviewed by Burns & McDonnell and the type and characteristics of each obstacle were visually estimated using publicly-available desktop aerial imagery. Trees and groups of trees were assumed to be 12 meters tall, barns and other outbuildings were assumed to be 4 meters tall, and grain bins were assumed to be 6 meters tall. Only obstacles in reasonably close proximity to a receptor were considered (i.e., those that might be expected to influence flicker durations).

Burns & McDonnell did not make any in-person verifications regarding the existence, size, or influence of obstacles. The obstacles were modeled exclusively through desktop analysis of aerial imagery.

2.7 Turbine Operation

Shadow flicker is contingent upon the movement of the turbine blades. Shadow flicker can only occur when the turbine is in operation (i.e., when the turbine blades are rotating). Moreover, shadow flicker is generally most notable when a turbine is facing a receptor, as this results in the widest-possible shadow being cast. To more accurately reflect the periods of operation of each Project wind turbine, on-site hub-height wind data was provided by Developer and used to indicate the periods when the turbines are inactive due to wind speeds below the turbine cut-in speed or above the turbine cut-out speed, at which time the turbine rotor is not in motion and no shadow flicker will occur.

Project Site-specific wind data was also utilized to model the actual orientation of the turbines relative to each receptor. The Developer-provided wind data includes data collected by an on-site meteorological mast between September 2013 and September 2018. The provided data is shown in Appendix C.

Power curves for the proposed turbines were provided by Developer. These power curves were added to the WindPRO model to more accurately reflect the turbine's operational characteristics. The Developer-provided power curves are shown in Appendix E.

2.8 Flicker Relevance

At distances beyond 10 rotor diameters, shadow flicker effects are generally considered low, as shadows diffuse and become imperceptible. Thus, a distance equal to 10 times the rotor diameter of each turbine (i.e., 1370 meters) was modeled as the maximum distance at which shadow flicker was considered relevant; receptors greater than this distance from a given turbine were not evaluated. The proximity of this buffer relative to each receptor is presented graphically in Appendix A.

2.9 Sun Angle

The sun's path with respect to each turbine location is calculated by the WindPRO model to determine the cast shadow paths during every minute over a complete year. However, at very low sun angles, the light must pass through more atmosphere and becomes too diffused to form a coherent shadow. Thus, a value of three (3) degrees was utilized for the height at which the sun would not cause noticeable flicker.

2.10 Sun Obstruction

The percentage of the turbine blade covering the sun disc is calculated by the WindPRO model to determine the size of shadow cast during every minute over a complete year. By default, the WindPRO model calculates shadow flicker only when at least 20 percent of the sun disc is covered by the turbine blades. When less than 20 percent of the sun disc is masked by the blades, the shadow will be too diffuse to cause a coherent shadow.

2.11 Environment

Shadow flicker is only caused when the sun is shining. Sunshine probability data (see Appendix D) was obtained by Burns & McDonnell from www.city-data.com. This data represents the percentage of hours each month that the sun is expected to be shining during daylight hours, with consideration given for cloud cover, rainy days, fog, or other similar occurrences that may diminish the potential occurrence or severity of shadow flicker.

3.0 RESULTS

Using the inputs and parameters defined in Section 2.0, the WindPRO model was used to calculate shadow flicker for the receptors at the Project Site. Table 3-1 presents a summary of these results by landowner status for the applicable receptor. Detailed tables are included within Appendix F that present shadow flicker durations by receptor, including estimated hours per year and maximum minutes per day. Additionally, maps are provided in Appendix G which illustrate the shadow flicker vectors (in hours per year) caused by each Project turbine.

Table 3-1: Summary of Results

Landowner Status	No. of Turbines	No. of Receptors	No. of Receptors, Flicker ≥ 30 hr/yr	No. of Receptors, Flicker ≥ 30 min/day
Participating	62	48	2	13
Non-participating		101	1	14

The following is a set of key observations from the results of the Study:

- With the current layout, 3 of the 149 known receptors exceed 30 hours per year of shadow flicker. Additionally, 25 of the 149 known receptors exceed 30 minutes per day of shadow flicker, although approximately one quarter (7 of 25) exceed this daily threshold by only 5 or fewer minutes and more than half (13 of 25) exceed this daily threshold by only 10 or fewer minutes. Refer to Appendix F for a complete listing of results.
- The majority of observed shadow flicker on each receptor occurs during early morning and/or late afternoon and evening hours (see Appendix H).
- For purposes of this Study, a total of 62 turbine positions were evaluated, although Burns & McDonnell understands that only up to 61 turbines are expected to be installed. Depending on the turbine location(s) that are eliminated, flicker durations at impacted receptors are likely to decrease from those presented herein.
- The Study was performed using a conservative modeling approach with Project Site-specific conditions. For example, the Study modeled each receptor as a “green house”, meaning each receptor was modeled as having windows on all sides and effectively causing the home to be susceptible to flicker effects in all directions. Further, the majority of the receptor locations were modeled as if no obstacles were present, including trees or buildings, which may significantly reduce or eliminate the duration and/or intensity of shadow flicker at a receptor. Due to the conservative approach of the Study, the actual duration and intensity of shadow flicker experienced at each receptor is expected to be less than those reported in the Study.

- Notwithstanding any shadow flicker which may occur at the Project Site, mitigation techniques may be utilized to reduce these effects. Common techniques include planting vegetation, awning installation, and/or reduced turbine operation.

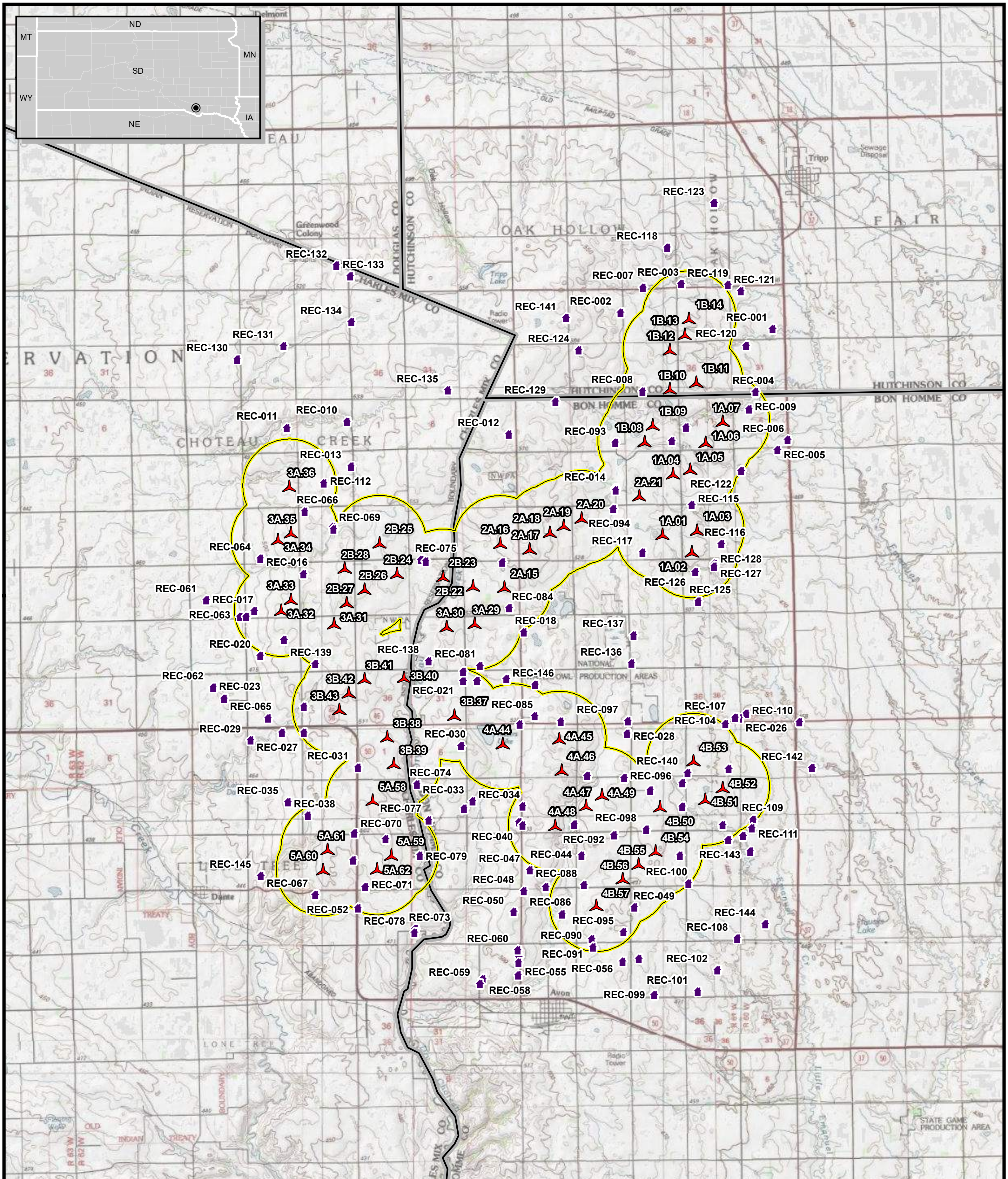
The following is an overview of the shadow flicker characteristics at receptors where obstacles were considered but impacts were not fully mitigated:

- REC-008 is receiving shadow flicker from 1B.10 to the east. While there are a few buildings in the vicinity, the area to the east is largely exposed to this source. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-009 is receiving shadow flicker from 1A.07 to the southwest. The area to the west-southwest is generally exposed, with insufficient geometry to fully mitigate shadow flicker. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-014 is receiving shadow flicker from 2A.21 to the southeast. While obstacles exist to the east of the receptor it is largely exposed to shadow flicker to the southeast. A reduction in flicker duration of approximately 6 hours/year was observed when considering obstacles at this receptor.
- REC-015 is receiving shadow flicker from 2A.21 to the southeast. This receptor is largely exposed to shadow flicker to the east and southeast. A reduction in flicker duration of approximately 7 hours/year was observed when considering obstacles at this receptor.
- REC-017 is receiving shadow flicker from 3A.32 to the east and 3A.33 to the northeast. Some trees and buildings reduce shadow impact, but the greatest exposure to shadow flicker is from the east where the receptor is partially exposed. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-024 is receiving shadow flicker from 3B.43 to the east. The receptor is largely exposed to the south and partially to the southeast. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-031 receiving shadow flicker from 3B.39 to the east. The receptor is largely exposed to the east. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-032 is receiving shadow flicker from 4B.50 to the southeast. Some buildings to the south reduce flicker, however the receptor is largely exposed to the south. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.

- REC-040 is receiving shadow flicker from 4A.48 to the east. Some obstacles are in line of flicker impact, but the area to the east-southeast is largely exposed. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-041 is receiving shadow flicker from 4A.48 to the west. While several obstacles are within close proximity to this receptor, there is direct exposure to the west. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-042 is receiving shadow flicker from 4B.50 to the southwest, from 4B.51 to the southeast, and from 4B.52 to the east-southeast. This receptor has several obstacles nearby to the north but is largely exposed to the east, west, and south. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-045 is receiving shadow flicker from 4B.54 to the west. While several obstacles are in the vicinity, the geometry of the obstacles is insufficient to fully reduce flicker impact. A reduction in flicker duration of approximately 3.5 hours/year was observed when considering obstacles at this receptor.
- REC-046 is receiving shadow flicker from 5A.60 and 5A.61 to the west and from 5A.59 and 5A.62 to the east. Several obstacles are in the vicinity; however, the receptor is largely exposed to the south and east. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-051 is receiving shadow flicker from 4B.57 to the northeast. This receptor is largely exposed to the east. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-070 is receiving shadow flicker form 5A.61 to the southwest. While some obstacles are in the vicinity, the geometry is insufficient to fully reduce flicker impacts to the west and southwest. A reduction in flicker duration of approximately 5.5 hours/year and 24 minutes/day was observed when considering obstacles at this receptor.
- REC-075 is receiving shadow flicker from 2B.23 to the southeast. While there are several obstacles in the vicinity, the receptor is exposed to the southeast. A reduction in flicker duration of approximately 23 hours/year and 22 minutes/day was observed when considering obstacles at this receptor.
- REC-076 is receiving shadow flicker from 2B.23 to the southeast and 2B.24 to the southwest and is largely exposed to the east and south, with some exposure to the west. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.

- REC-082 is receiving shadow from 2B.22 to the southwest. This receptor has several obstacles in the vicinity but is partially exposed to the southwest. A reduction in flicker duration of approximately 13 hours/year and 6 minutes/day when considering obstacles at this receptor.
- REC-089 is receiving shadow flicker from 4A.46 to the northwest and 4A.49 to the southeast. While there are several obstacles in the vicinity, the geometry is insufficient to fully mitigate shadow flicker impacts. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-093 is receiving shadow flicker from 1B.08 to the east and 1B.09 to the northeast. This receptor is largely exposed to the east and south. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-094 is receiving shadow flicker from 2A.20 to the southwest and 2A.21 to the northeast. This receptor has some obstacles in the vicinity, but there remains sparse coverage to the east, south, and southeast. A reduction in flicker duration of approximately 6 hours/year was observed when considering obstacles at this receptor.
- REC-096 is receiving shadow flicker from 4B.50 to the southeast and 4A.49 to the southwest. Several obstacles are in the vicinity, but there remains exposure to the east and southeast. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-112 is receiving shadow flicker from 3A.36 to the east where there are some obstacles present; however, the geometry is insufficient to fully mitigate shadow flicker impact. Thus, no reduction in flicker duration was observed when considering obstacles at this receptor.
- REC-113 is receiving shadow flicker from 1B.08 to the east. This receptor is exposed to the east and south. A reduction in flicker duration of approximately 11 hours/year and 33 minutes /day was observed when considering obstacles at this receptor.
- REC 114 is receiving shadow flicker from 1B.08 to the southwest, 1A.06 to the southeast, and 1B.09 to the east and is exposed to the east, with some exposure to the west and partial exposure to the south. A reduction in flicker duration of approximately 8 hours/year and 10 minutes/day was observed when considering obstacles at this receptor.

APPENDIX A - PROJECT SITE LAYOUT



LEGEND

- County Boundary
- Wind Turbine
- Receptor
- Wind Turbine Buffer (1370m)

REFERENCE

0 1.5 3 MILES

0 1.5 3 KILOMETERS

N

PREVAILING WIND PARK
Project Site Layout - GE 3.8-137 Flicker Buffer

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	10/03/2018

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Path: \\bmcd\dfs\Clients\BTS\SPowerDC\105644_PrvWindStudies\Studies\Geospatial\DataFiles\ArcDocs\105644_PrevailingWinds_85x11P_ShadowFlicker.mxd • Coordinate System: NAD 1983 UTM Zone 14N • Units: Meter

APPENDIX B - INFRASTRUCTURE COORDINATES

Table B-1: Turbine Coordinates

Turbine Number	Easting [m]	Northing [m]
1A.01	579,956	4,775,946
1A.02	580,807	4,775,443
1A.03	580,970	4,776,074
1A.04	580,259	4,777,725
1A.05	580,759	4,777,855
1A.06	581,221	4,778,640
1A.07	581,719	4,779,255
1B.08	579,428	4,778,668
1B.09	579,671	4,779,153
1B.10	580,170	4,780,211
1B.11	580,939	4,780,407
1B.12	580,170	4,781,359
1B.13	580,604	4,781,811
1B.14	580,727	4,782,275
2A.15	575,324	4,774,400
2A.16	575,201	4,775,693
2A.17	576,064	4,775,521
2A.18	576,650	4,776,014
2A.19	577,060	4,776,210
2A.20	577,580	4,776,426
2A.21	579,275	4,777,079
2B.22	574,404	4,774,437
2B.23	573,519	4,774,711
2B.24	572,179	4,774,804
2B.25	571,662	4,775,700
2B.26	571,219	4,774,346
2B.27	570,700	4,773,949
2B.28	570,639	4,774,959
3A.29	574,452	4,773,338
3A.30	573,634	4,773,249
3A.31	570,336	4,773,327
3A.32	568,781	4,773,724
3A.33	569,071	4,774,045
3A.34	568,691	4,775,793
3A.35	569,074	4,775,995

Turbine Number	Easting [m]	Northing [m]
3A.36	569,026	4,777,349
3B.37	573,856	4,770,651
3B.38	571,896	4,770,015
3B.39	572,076	4,769,232
3B.40	572,380	4,771,753
3B.41	571,220	4,771,721
3B.42	570,763	4,771,308
3B.43	570,487	4,770,821
4A.44	575,275	4,769,819
4A.45	576,925	4,769,963
4A.46	576,997	4,769,043
4A.47	577,718	4,768,001
4A.48	576,805	4,767,428
4A.49	578,173	4,768,318
4B.50	579,886	4,767,974
4B.51	581,200	4,768,190
4B.52	581,716	4,768,536
4B.53	580,860	4,769,311
4B.54	579,755	4,766,668
4B.55	579,255	4,766,296
4B.56	578,787	4,765,862
4B.57	578,011	4,765,079
5A.58	571,464	4,768,160
5A.59	572,004	4,766,553
5A.60	570,006	4,766,129
5A.61	570,143	4,766,716
5A.62	571,597	4,766,151

Notes:
[1] All coordinates presented in UTM NAD83 Zone 14N (meters)
[2] All coordinates provided by Developer in "PWIND - 62x GE38137 111p5m v180925-02" on 20180925

Table B-2: Receptor Coordinates

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-001	583,179	4,781,949	Hutchinson	Non-participating
REC-002	578,731	4,782,429	Hutchinson	Participating
REC-003	580,507	4,783,274	Hutchinson	Non-participating
REC-004	582,679	4,780,105	Hutchinson	Non-participating
REC-005	583,327	4,778,397	Bon Homme	Non-participating
REC-006	583,615	4,778,695	Bon Homme	Non-participating
REC-007	579,386	4,783,172	Hutchinson	Non-participating
REC-008*	579,365	4,780,123	Hutchinson	Non-participating
REC-009*	582,486	4,779,597	Bon Homme	Non-participating
REC-010	570,706	4,779,233	Charles Mix	Non-participating
REC-011	568,955	4,779,050	Charles Mix	Non-participating
REC-012	575,451	4,778,870	Bon Homme	Non-participating
REC-013	570,834	4,777,924	Charles Mix	Non-participating
REC-014*	578,568	4,777,265	Bon Homme	Non-participating
REC-015*	578,579	4,777,228	Bon Homme	Non-participating
REC-016	569,438	4,774,776	Charles Mix	Participating
REC-017*	568,000	4,773,684	Charles Mix	Non-participating
REC-018	575,894	4,773,069	Bon Homme	Participating
REC-019	568,870	4,772,838	Charles Mix	Participating
REC-020	568,171	4,772,373	Charles Mix	Non-participating
REC-021	574,123	4,771,642	Bon Homme	Participating
REC-022	574,118	4,771,913	Bon Homme	Non-participating
REC-023	567,115	4,771,132	Charles Mix	Non-participating
REC-024*	569,456	4,770,886	Charles Mix	Non-participating
REC-025	582,410	4,770,691	Bon Homme	Participating
REC-026	582,206	4,770,538	Bon Homme	Non-participating
REC-027	569,451	4,770,123	Charles Mix	Non-participating
REC-028	578,916	4,770,107	Bon Homme	Participating
REC-029	567,890	4,769,897	Charles Mix	Non-participating
REC-030	574,058	4,769,738	Bon Homme	Non-participating
REC-031*	571,038	4,769,100	Charles Mix	Non-participating
REC-032*	579,595	4,768,434	Bon Homme	Participating
REC-033	574,388	4,768,112	Bon Homme	Non-participating
REC-034*	575,857	4,767,969	Bon Homme	Non-participating
REC-035	568,988	4,768,088	Charles Mix	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-036	574,140	4,767,903	Bon Homme	Non-participating
REC-037*	580,535	4,767,956	Bon Homme	Participating
REC-038	569,571	4,767,694	Charles Mix	Non-participating
REC-039*	575,754	4,767,512	Bon Homme	Non-participating
REC-040*	575,854	4,767,409	Bon Homme	Non-participating
REC-041*	577,366	4,767,429	Bon Homme	Participating
REC-042*	580,535	4,768,650	Bon Homme	Non-participating
REC-043	582,314	4,767,105	Bon Homme	Non-participating
REC-044	577,582	4,766,535	Bon Homme	Participating
REC-045*	580,460	4,766,528	Bon Homme	Participating
REC-046*	570,892	4,766,384	Charles Mix	Participating
REC-047	576,072	4,766,099	Bon Homme	Non-participating
REC-048	575,888	4,765,484	Bon Homme	Non-participating
REC-049	579,136	4,765,004	Bon Homme	Non-participating
REC-050	575,594	4,764,878	Bon Homme	Participating
REC-051*	577,015	4,764,806	Bon Homme	Participating
REC-052	571,035	4,764,976	Charles Mix	Non-participating
REC-053	575,752	4,763,554	Bon Homme	Non-participating
REC-054	579,261	4,763,509	Bon Homme	Non-participating
REC-055	575,738	4,763,383	Bon Homme	Non-participating
REC-056	578,784	4,763,423	Bon Homme	Non-participating
REC-057	575,729	4,763,021	Bon Homme	Non-participating
REC-058	574,690	4,762,906	Bon Homme	Non-participating
REC-059	574,609	4,762,765	Bon Homme	Non-participating
REC-060	575,719	4,763,759	Bon Homme	Non-participating
REC-061	566,590	4,774,005	Charles Mix	Non-participating
REC-062	566,795	4,771,446	Charles Mix	Non-participating
REC-063	567,576	4,773,523	Charles Mix	Non-participating
REC-064	568,170	4,775,222	Charles Mix	Non-participating
REC-065	568,402	4,770,548	Charles Mix	Non-participating
REC-066	569,475	4,776,605	Charles Mix	Participating
REC-067	569,782	4,765,374	Charles Mix	Non-participating
REC-068	570,301	4,776,152	Charles Mix	Non-participating
REC-069	570,321	4,776,086	Charles Mix	Non-participating
REC-070*	570,931	4,767,169	Charles Mix	Non-participating
REC-071	571,247	4,765,598	Charles Mix	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-072	571,848	4,767,001	Charles Mix	Participating
REC-073	572,712	4,764,371	Charles Mix	Non-participating
REC-074	572,760	4,768,610	Bon Homme	Non-participating
REC-075*	572,875	4,775,184	Charles Mix	Participating
REC-076*	573,024	4,775,138	Charles Mix	Non-participating
REC-077	573,104	4,767,559	Bon Homme	Non-participating
REC-078	572,690	4,764,270	Charles Mix	Non-participating
REC-079*	572,840	4,766,532	Charles Mix	Participating
REC-080	574,527	4,771,635	Bon Homme	Participating
REC-081	574,606	4,772,084	Bon Homme	Participating
REC-082*	575,265	4,775,117	Bon Homme	Participating
REC-083	575,384	4,771,696	Bon Homme	Participating
REC-084	575,460	4,773,772	Bon Homme	Participating
REC-085*	576,210	4,770,611	Bon Homme	Participating
REC-086	576,538	4,765,598	Bon Homme	Participating
REC-087	576,971	4,770,447	Bon Homme	Participating
REC-088	577,660	4,765,661	Bon Homme	Participating
REC-089*	577,747	4,768,860	Bon Homme	Participating
REC-090	577,878	4,764,079	Bon Homme	Non-participating
REC-091	577,916	4,763,844	Bon Homme	Non-participating
REC-092	578,532	4,767,119	Bon Homme	Participating
REC-093*	578,576	4,778,619	Bon Homme	Participating
REC-094*	578,515	4,776,677	Bon Homme	Participating
REC-095	578,804	4,764,275	Bon Homme	Non-participating
REC-096*	578,828	4,768,793	Bon Homme	Non-participating
REC-097	578,943	4,770,455	Bon Homme	Non-participating
REC-098	579,475	4,767,289	Bon Homme	Non-participating
REC-099	579,721	4,762,442	Bon Homme	Participating
REC-100	580,720	4,765,706	Bon Homme	Non-participating
REC-101	580,992	4,762,541	Bon Homme	Non-participating
REC-102	581,560	4,763,175	Bon Homme	Non-participating
REC-103	581,721	4,767,420	Bon Homme	Participating
REC-104	581,794	4,770,381	Bon Homme	Non-participating
REC-105*	581,891	4,769,063	Bon Homme	Non-participating
REC-106	581,883	4,766,985	Bon Homme	Participating
REC-107	582,090	4,770,568	Bon Homme	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-108	582,148	4,764,102	Bon Homme	Participating
REC-109	582,610	4,767,583	Bon Homme	Non-participating
REC-110	583,963	4,770,430	Bon Homme	Non-participating
REC-111	582,578	4,767,332	Bon Homme	Non-participating
REC-112*	570,034	4,777,429	Charles Mix	Non-participating
REC-113*	580,226	4,778,670	Bon Homme	Participating
REC-114*	580,644	4,779,066	Bon Homme	Participating
REC-115	580,813	4,776,798	Bon Homme	Participating
REC-116*	581,676	4,775,654	Bon Homme	Participating
REC-117	579,368	4,775,404	Bon Homme	Participating
REC-118	580,095	4,784,337	Hutchinson	Non-participating
REC-119	581,868	4,783,246	Hutchinson	Non-participating
REC-120	582,411	4,781,467	Hutchinson	Non-participating
REC-121	582,256	4,783,055	Hutchinson	Non-participating
REC-122	582,261	4,777,793	Bon Homme	Participating
REC-123	581,461	4,785,646	Hutchinson	Non-participating
REC-124	577,505	4,781,336	Hutchinson	Non-participating
REC-125	580,996	4,773,976	Bon Homme	Non-participating
REC-126	580,916	4,774,830	Bon Homme	Participating
REC-127*	581,474	4,775,076	Bon Homme	Participating
REC-128	581,468	4,774,997	Bon Homme	Participating
REC-129	576,816	4,779,814	Bon Homme	Non-participating
REC-130	567,502	4,781,060	Charles Mix	Non-participating
REC-131	568,850	4,781,446	Charles Mix	Non-participating
REC-132	570,408	4,783,811	Charles Mix	Non-participating
REC-133	570,806	4,783,497	Charles Mix	Non-participating
REC-134	570,845	4,782,153	Charles Mix	Non-participating
REC-135	573,665	4,780,153	Charles Mix	Non-participating
REC-136	579,049	4,772,150	Bon Homme	Non-participating
REC-137	579,104	4,772,978	Bon Homme	Non-participating
REC-138*	573,105	4,772,224	Bon Homme	Participating
REC-139	569,781	4,772,134	Charles Mix	Non-participating
REC-140	580,689	4,768,952	Bon Homme	Non-participating
REC-141	577,130	4,782,270	Hutchinson	Non-participating
REC-142	584,340	4,769,093	Bon Homme	Non-participating
REC-143	582,522	4,766,643	Bon Homme	Non-participating

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status
REC-144	582,964	4,764,514	Bon Homme	Non-participating
REC-145	568,186	4,765,929	Charles Mix	Non-participating
REC-146	576,221	4,771,527	Bon Homme	Participating
REC-147	575,778	4,770,361	Bon Homme	Participating
REC-148	568,806	4,770,128	Charles Mix	Non-participating
REC-149	567,763	4,773,526	Charles Mix	Non-participating

Notes:
[1] All coordinates presented in UTM NAD83 Zone 14N (meters)
[2] Coordinates provided by Developer in "RECEPTORS-OCCUPIED.KMZ" and through field investigation data provided 20180920
[3] Participating status provided by Developer in "Prevailing Winds - Homes on Leased Land" dated 20180516
[4] * Indicates receptor that was analyzed with obstacles.

APPENDIX C - ON-SITE FREQUENCY DISTRIBUTION

Table C-1: Onsite Frequency Distribution, 111.5 magl

Bin	Wind Direction [degrees]											
[m/s]	0	30	60	90	120	150	180	210	240	270	300	330
0	11.63	9.15	7.94	7.92	7.53	7.80	8.96	5.46	5.14	5.35	10.68	12.43
1	11.51	9.25	11.54	9.35	8.16	4.89	3.58	8.52	9.42	9.91	10.83	10.20
2	20.70	20.13	20.43	17.93	15.71	12.23	10.56	15.50	18.48	21.81	17.68	17.72
3	33.22	34.35	34.95	33.11	29.54	23.68	20.09	29.61	31.54	34.00	27.44	29.54
4	52.15	56.03	57.94	55.29	52.65	35.96	28.99	46.16	45.04	55.74	46.51	48.70
5	72.48	70.20	75.20	70.95	67.65	50.49	38.48	52.72	57.06	64.37	57.02	66.18
6	81.89	83.87	81.78	85.27	89.90	69.52	50.15	62.29	68.49	78.41	65.81	71.98
7	96.59	95.00	98.95	97.99	102.77	81.21	57.90	72.27	81.10	84.11	76.67	81.19
8	102.03	89.37	95.39	101.36	101.50	88.94	76.50	77.23	90.82	89.96	84.70	86.32
9	104.00	95.04	105.73	95.63	101.91	103.82	97.70	99.43	98.02	93.31	87.28	87.37
10	91.57	103.26	106.21	98.09	107.43	111.11	107.15	107.33	109.89	102.07	92.31	92.86
11	90.03	91.21	95.97	96.93	95.27	114.82	130.43	109.07	110.93	99.29	95.28	86.57
12	72.68	71.41	72.31	78.47	80.22	97.90	124.26	102.86	90.53	86.11	87.42	81.99
13	55.36	56.78	53.37	59.24	59.95	78.28	104.76	87.84	71.31	62.37	69.16	65.63
14	40.54	40.48	33.32	40.20	39.37	55.87	69.60	59.70	50.90	49.04	54.02	47.97
15	26.30	27.72	22.60	26.65	21.13	36.25	35.80	31.98	30.57	26.73	37.69	36.57
16	19.06	18.47	13.08	15.28	9.32	19.23	22.26	18.43	15.66	18.46	25.87	26.87
17	11.91	12.71	6.83	7.28	6.69	7.58	10.69	7.61	7.57	10.26	20.54	20.48
18	7.90	10.59	5.39	4.48	4.71	4.06	6.00	3.14	4.30	6.27	14.83	13.39
19	4.72	6.88	3.08	2.84	3.40	1.52	3.19	2.30	3.12	2.14	8.86	10.20
20	2.26	4.50	2.50	1.45	1.01	0.64	0.68	1.54	1.78	2.07	6.90	6.91
21	1.57	1.50	1.73	1.40	0.96	0.54	0.30	0.56	1.11	1.50	4.82	4.08
22	0.62	0.63	0.58	0.53	0.25	0.20	0.13	0.70	0.82	1.07	3.11	3.07
23	0.46	0.25	0.48	0.05	0.30	0.15	0.21	0.63	0.97	0.71	2.22	1.69
24	0.26	0.04	0.29	0.19	0.15	0.20	0.04	0.63	0.15	0.14	1.47	0.98
25	0.16	0.04	0.14	0.05	0.05	0.15	0.26	0.77	0.15	0.00	1.04	0.74
26	0.00	0.13	0.14	0.00	0.00	0.10	0.21	0.28	0.07	0.07	0.39	0.40
27	0.03	0.13	0.10	0.00	0.00	0.29	0.04	0.21	0.00	0.07	0.14	0.25
28	0.00	0.04	0.00	0.00	0.00	0.29	0.04	0.28	0.00	0.00	0.04	0.09
29	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.14	0.00	0.00	0.00	0.06
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.15	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sum	**1012**	**1009**	**1008**	**1008**	**1008**	**1008**	**1009**	**1005**	**1005**	**1005**	**1011**	**1012**

Notes:
[1] All data provided by Developer via "Prevailing Winds Site Average.windog"
[2] All data presented in milles for period from September 20, 2013 to September 13, 2018
[3] All data presented at 111.5 magl

APPENDIX D - SUNSHINE PROBABILITY DATA

Figure D-1: Monthly Sunshine Probability for Wagner, South Dakota

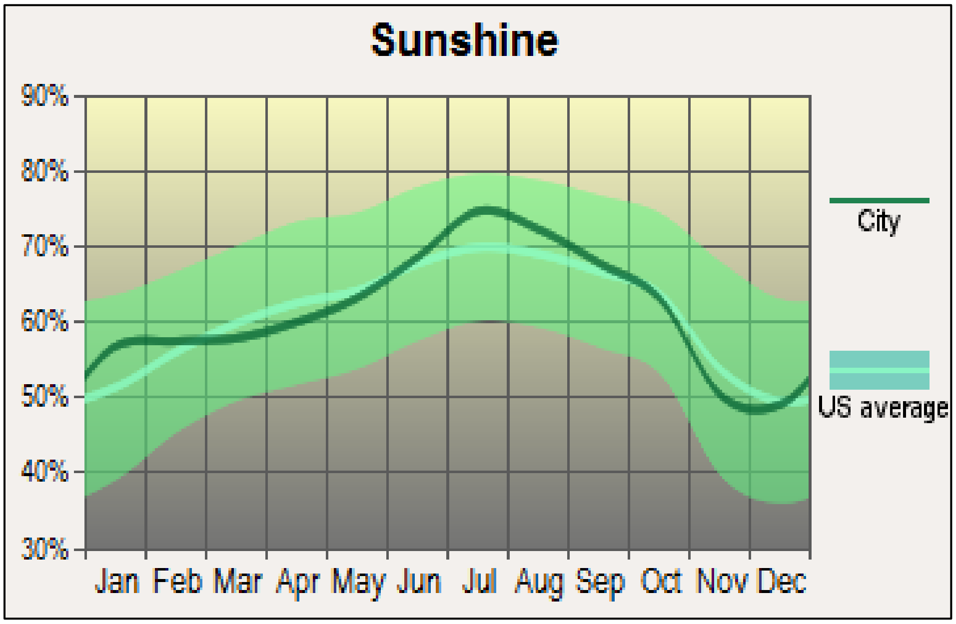


Table D-1: Monthly Sunshine Probability for Wagner, South Dakota

Month	Avg Sunshine Probability
January	58%
February	58%
March	59%
April	60%
May	63%
June	69%
July	74%
August	72%
September	68%
October	65%
November	50%
December	50%

Notes:
[1] Data source: http://www.city-data.com/city/Wagner-South-Dakota.html
[2] Data location: Wagner, South Dakota
[3] Data in Table D-1 estimated from source data in Figure D-1

APPENDIX E - POWER CURVE

Table E-1: GE 3.8-137 Power Curve Values

Wind Speed [m/s]	Power [kW]
0.0	0
1.0	0
2.0	0
3.0	14
4.0	179
5.0	434
6.0	786
7.0	1269
8.0	1906
9.0	2648
10.0	3284
11.0	3776
12.0	3830
13.0	3830
14.0	3830
15.0	3830
16.0	3830
17.0	3830
18.0	3830
19.0	3830
20.0	3830
21.0	3830
22.0	3830
23.0	3830
24.0	3830
25.0	3830

Notes:
[1] Power curve for air density of 1.16 kg/m3 and site-specific TI band
[2] All data provided by Developer via "Site Specific Power Curve - PCD_1206271_PrevailingWind_3.8-137_EN_r01"

APPENDIX F - FLICKER RESULTS BY RECEPTOR

Table F-1: Flicker Duration by Receptor

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-001	583,179	4,781,949	Hutchinson	Non-participating	0.00	0
REC-002	578,731	4,782,429	Hutchinson	Participating	0.00	0
REC-003	580,507	4,783,274	Hutchinson	Non-participating	0.00	0
REC-004	582,679	4,780,105	Hutchinson	Non-participating	5.67	27
REC-005	583,327	4,778,397	Bon Homme	Non-participating	0.00	0
REC-006	583,615	4,778,695	Bon Homme	Non-participating	0.00	0
REC-007	579,386	4,783,172	Hutchinson	Non-participating	0.00	0
REC-008*	579,365	4,780,123	Hutchinson	Non-participating	11.02	39
REC-009*	582,486	4,779,597	Bon Homme	Non-participating	9.22	38
REC-010	570,706	4,779,233	Charles Mix	Non-participating	0.00	0
REC-011	568,955	4,779,050	Charles Mix	Non-participating	0.00	0
REC-012	575,451	4,778,870	Bon Homme	Non-participating	0.00	0
REC-013	570,834	4,777,924	Charles Mix	Non-participating	0.00	0
REC-014*	578,568	4,777,265	Bon Homme	Non-participating	12.22	43
REC-015*	578,579	4,777,228	Bon Homme	Non-participating	12.83	44
REC-016	569,438	4,774,776	Charles Mix	Participating	4.80	27
REC-017*	568,000	4,773,684	Charles Mix	Non-participating	19.87	40
REC-018	575,894	4,773,069	Bon Homme	Participating	0.00	0
REC-019	568,870	4,772,838	Charles Mix	Participating	0.00	0
REC-020	568,171	4,772,373	Charles Mix	Non-participating	0.00	0
REC-021	574,123	4,771,642	Bon Homme	Participating	0.00	0
REC-022	574,118	4,771,913	Bon Homme	Non-participating	0.00	0
REC-023	567,115	4,771,132	Charles Mix	Non-participating	0.00	0
REC-024*	569,456	4,770,886	Charles Mix	Non-participating	6.20	31
REC-025	582,410	4,770,691	Bon Homme	Participating	0.00	0
REC-026	582,206	4,770,538	Bon Homme	Non-participating	0.00	0
REC-027	569,451	4,770,123	Charles Mix	Non-participating	0.00	0
REC-028	578,916	4,770,107	Bon Homme	Participating	0.00	0
REC-029	567,890	4,769,897	Charles Mix	Non-participating	0.00	0
REC-030	574,058	4,769,738	Bon Homme	Non-participating	3.57	25
REC-031*	571,038	4,769,100	Charles Mix	Non-participating	6.43	31
REC-032*	579,595	4,768,434	Bon Homme	Participating	9.67	45
REC-033	574,388	4,768,112	Bon Homme	Non-participating	0.00	0
REC-034*	575,857	4,767,969	Bon Homme	Non-participating	0.00	0
REC-035	568,988	4,768,088	Charles Mix	Non-participating	0.00	0
REC-036	574,140	4,767,903	Bon Homme	Non-participating	0.00	0
REC-037*	580,535	4,767,956	Bon Homme	Participating	0.00	0
REC-038	569,571	4,767,694	Charles Mix	Non-participating	0.00	0
REC-039*	575,754	4,767,512	Bon Homme	Non-participating	0.00	0
REC-040*	575,854	4,767,409	Bon Homme	Non-participating	7.42	34
REC-041*	577,366	4,767,429	Bon Homme	Participating	22.70	55
REC-042*	580,535	4,768,650	Bon Homme	Non-participating	28.00	53
REC-043	582,314	4,767,105	Bon Homme	Non-participating	0.00	0
REC-044	577,582	4,766,535	Bon Homme	Participating	0.00	0

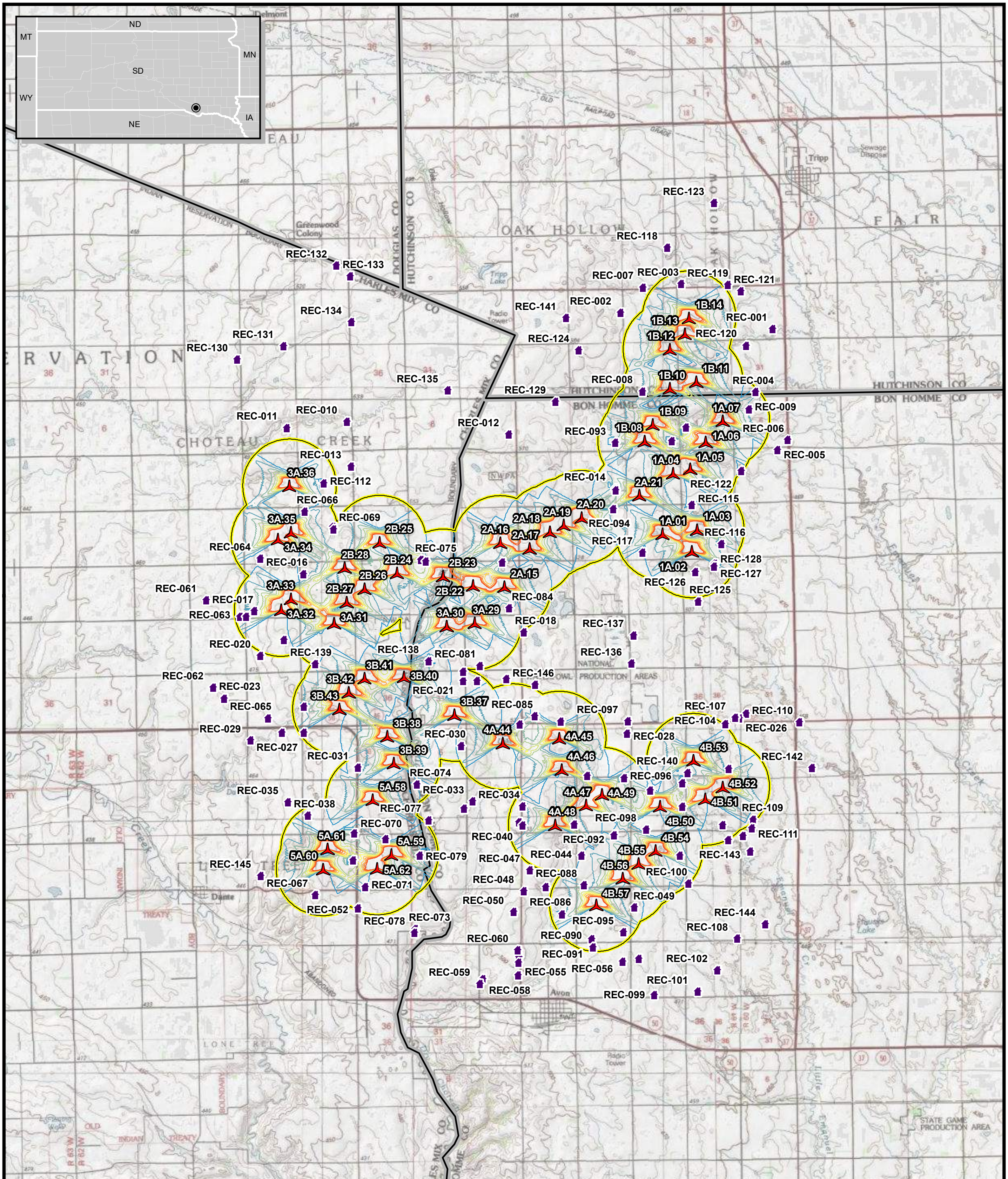
Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-045*	580,460	4,766,528	Bon Homme	Participating	18.48	45
REC-046*	570,892	4,766,384	Charles Mix	Participating	46.25	76
REC-047	576,072	4,766,099	Bon Homme	Non-participating	0.00	0
REC-048	575,888	4,765,484	Bon Homme	Non-participating	0.00	0
REC-049	579,136	4,765,004	Bon Homme	Non-participating	4.85	27
REC-050	575,594	4,764,878	Bon Homme	Participating	0.00	0
REC-051*	577,015	4,764,806	Bon Homme	Participating	8.20	32
REC-052	571,035	4,764,976	Charles Mix	Non-participating	0.00	0
REC-053	575,752	4,763,554	Bon Homme	Non-participating	0.00	0
REC-054	579,261	4,763,509	Bon Homme	Non-participating	0.00	0
REC-055	575,738	4,763,383	Bon Homme	Non-participating	0.00	0
REC-056	578,784	4,763,423	Bon Homme	Non-participating	0.00	0
REC-057	575,729	4,763,021	Bon Homme	Non-participating	0.00	0
REC-058	574,690	4,762,906	Bon Homme	Non-participating	0.00	0
REC-059	574,609	4,762,765	Bon Homme	Non-participating	0.00	0
REC-060	575,719	4,763,759	Bon Homme	Non-participating	0.00	0
REC-061	566,590	4,774,005	Charles Mix	Non-participating	0.00	0
REC-062	566,795	4,771,446	Charles Mix	Non-participating	0.00	0
REC-063	567,576	4,773,523	Charles Mix	Non-participating	5.02	27
REC-064	568,170	4,775,222	Charles Mix	Non-participating	0.00	0
REC-065	568,402	4,770,548	Charles Mix	Non-participating	0.00	0
REC-066	569,475	4,776,605	Charles Mix	Participating	0.00	0
REC-067	569,782	4,765,374	Charles Mix	Non-participating	0.00	0
REC-068	570,301	4,776,152	Charles Mix	Non-participating	3.13	24
REC-069	570,321	4,776,086	Charles Mix	Non-participating	3.20	24
REC-070*	570,931	4,767,169	Charles Mix	Non-participating	8.80	36
REC-071	571,247	4,765,598	Charles Mix	Non-participating	11.72	25
REC-072	571,848	4,767,001	Charles Mix	Participating	0.00	0
REC-073	572,712	4,764,371	Charles Mix	Non-participating	0.00	0
REC-074	572,760	4,768,610	Bon Homme	Non-participating	0.00	0
REC-075*	572,875	4,775,184	Charles Mix	Participating	20.17	42
REC-076*	573,024	4,775,138	Charles Mix	Non-participating	33.90	51
REC-077	573,104	4,767,559	Bon Homme	Non-participating	0.00	0
REC-078	572,690	4,764,270	Charles Mix	Non-participating	0.00	0
REC-079*	572,840	4,766,532	Charles Mix	Participating	0.00	0
REC-080	574,527	4,771,635	Bon Homme	Participating	0.00	0
REC-081	574,606	4,772,084	Bon Homme	Participating	0.00	0
REC-082*	575,265	4,775,117	Bon Homme	Participating	8.75	31
REC-083	575,384	4,771,696	Bon Homme	Participating	0.00	0
REC-084	575,460	4,773,772	Bon Homme	Participating	4.85	29
REC-085*	576,210	4,770,611	Bon Homme	Participating	0.00	0
REC-086	576,538	4,765,598	Bon Homme	Participating	0.00	0
REC-087	576,971	4,770,447	Bon Homme	Participating	0.00	0
REC-088	577,660	4,765,661	Bon Homme	Participating	5.57	28
REC-089*	577,747	4,768,860	Bon Homme	Participating	24.83	42

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-090	577,878	4,764,079	Bon Homme	Non-participating	0.00	0
REC-091	577,916	4,763,844	Bon Homme	Non-participating	0.00	0
REC-092	578,532	4,767,119	Bon Homme	Participating	3.78	24
REC-093*	578,576	4,778,619	Bon Homme	Participating	20.83	37
REC-094*	578,515	4,776,677	Bon Homme	Participating	12.23	38
REC-095	578,804	4,764,275	Bon Homme	Non-participating	0.00	0
REC-096*	578,828	4,768,793	Bon Homme	Non-participating	22.47	54
REC-097	578,943	4,770,455	Bon Homme	Non-participating	0.00	0
REC-098	579,475	4,767,289	Bon Homme	Non-participating	0.00	0
REC-099	579,721	4,762,442	Bon Homme	Participating	0.00	0
REC-100	580,720	4,765,706	Bon Homme	Non-participating	0.00	0
REC-101	580,992	4,762,541	Bon Homme	Non-participating	0.00	0
REC-102	581,560	4,763,175	Bon Homme	Non-participating	0.00	0
REC-103	581,721	4,767,420	Bon Homme	Participating	0.00	0
REC-104	581,794	4,770,381	Bon Homme	Non-participating	0.00	0
REC-105*	581,891	4,769,063	Bon Homme	Non-participating	0.00	0
REC-106	581,883	4,766,985	Bon Homme	Participating	0.00	0
REC-107	582,090	4,770,568	Bon Homme	Non-participating	0.00	0
REC-108	582,148	4,764,102	Bon Homme	Participating	0.00	0
REC-109	582,610	4,767,583	Bon Homme	Non-participating	0.00	0
REC-110	583,963	4,770,430	Bon Homme	Non-participating	0.00	0
REC-111	582,578	4,767,332	Bon Homme	Non-participating	0.00	0
REC-112*	570,034	4,777,429	Charles Mix	Non-participating	5.37	31
REC-113*	580,226	4,778,670	Bon Homme	Participating	5.92	31
REC-114*	580,644	4,779,066	Bon Homme	Participating	32.80	46
REC-115	580,813	4,776,798	Bon Homme	Participating	1.73	17
REC-116*	581,676	4,775,654	Bon Homme	Participating	0.00	0
REC-117	579,368	4,775,404	Bon Homme	Participating	0.00	0
REC-118	580,095	4,784,337	Hutchinson	Non-participating	0.00	0
REC-119	581,868	4,783,246	Hutchinson	Non-participating	0.00	0
REC-120	582,411	4,781,467	Hutchinson	Non-participating	0.00	0
REC-121	582,256	4,783,055	Hutchinson	Non-participating	0.00	0
REC-122	582,261	4,777,793	Bon Homme	Participating	0.00	0
REC-123	581,461	4,785,646	Hutchinson	Non-participating	0.00	0
REC-124	577,505	4,781,336	Hutchinson	Non-participating	0.00	0
REC-125	580,996	4,773,976	Bon Homme	Non-participating	0.00	0
REC-126	580,916	4,774,830	Bon Homme	Participating	0.00	0
REC-127*	581,474	4,775,076	Bon Homme	Participating	0.00	0
REC-128	581,468	4,774,997	Bon Homme	Participating	0.00	0
REC-129	576,816	4,779,814	Bon Homme	Non-participating	0.00	0
REC-130	567,502	4,781,060	Charles Mix	Non-participating	0.00	0
REC-131	568,850	4,781,446	Charles Mix	Non-participating	0.00	0
REC-132	570,408	4,783,811	Charles Mix	Non-participating	0.00	0
REC-133	570,806	4,783,497	Charles Mix	Non-participating	0.00	0
REC-134	570,845	4,782,153	Charles Mix	Non-participating	0.00	0

Receptor Name	Easting [m]	Northing [m]	County Name	Participating Status	Flicker Duration [hour/year]	Flicker Duration [max min/day]
REC-135	573,665	4,780,153	Charles Mix	Non-participating	0.00	0
REC-136	579,049	4,772,150	Bon Homme	Non-participating	0.00	0
REC-137	579,104	4,772,978	Bon Homme	Non-participating	0.00	0
REC-138*	573,105	4,772,224	Bon Homme	Participating	0.00	0
REC-139	569,781	4,772,134	Charles Mix	Non-participating	6.15	26
REC-140	580,689	4,768,952	Bon Homme	Non-participating	5.27	29
REC-141	577,130	4,782,270	Hutchinson	Non-participating	0.00	0
REC-142	584,340	4,769,093	Bon Homme	Non-participating	0.00	0
REC-143	582,522	4,766,643	Bon Homme	Non-participating	0.00	0
REC-144	582,964	4,764,514	Bon Homme	Non-participating	0.00	0
REC-145	568,186	4,765,929	Charles Mix	Non-participating	0.00	0
REC-146	576,221	4,771,527	Bon Homme	Participating	0.00	0
REC-147	575,778	4,770,361	Bon Homme	Participating	15.03	43
REC-148	568,806	4,770,128	Charles Mix	Non-participating	0.00	0
REC-149	567,763	4,773,526	Charles Mix	Non-participating	7.35	31

Notes:
[1] All coordinates presented in UTM NAD83 Zone 14N (meters)
[2] All results based on turbine layout in Table B-1
[3] * Indicates receptor that was analyzed with obstacles.

APPENDIX G - SHADOW FLICKER DURATION MAP



Path: \\bmcd\dfs\Clients\BTS\SPowerDC\105644_PrvWindStudies\Studies\Geospatial\DataFiles\ArcDocs\105644_PrevailingWinds_85x11P_ShadowFlicker.mxd • Coordinate System: NAD 1983 UTM Zone 14N • Units: Meter

LEGEND

- County Boundary
- Wind Turbine
- Receptor
- Wind Turbine Buffer (1370m)

Shadow Flicker Vectors [hours per year]

0 10 20 30 40 50 60 70 80 90 100

REFERENCE

0 1.5 3
MILES

0 1.5 3
KILOMETERS

N

PREVAILING WIND PARK

Shadow Flicker Duration [Hr/Yr] - GE 3.8-137 Layout

LOCATION:	Charles Mix/Bonne Homme/Hutchinson Cty, SD
CLIENT:	Prevailing Wind Park, LLC
PROJ. NO.:	105644
CREATED:	10/03/2018

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www.burnsmcd.com

APPENDIX H - SHADOW FLICKER CALENDAR

Project:
sPower Shadow Flicker

Description:
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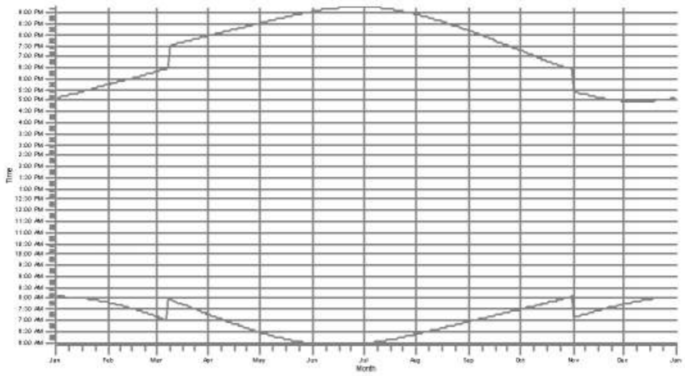
Calculated:
10/3/2018 3:53 PM/3.0.654

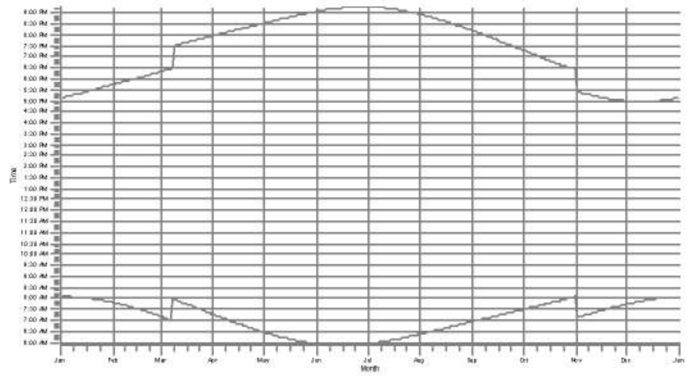
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

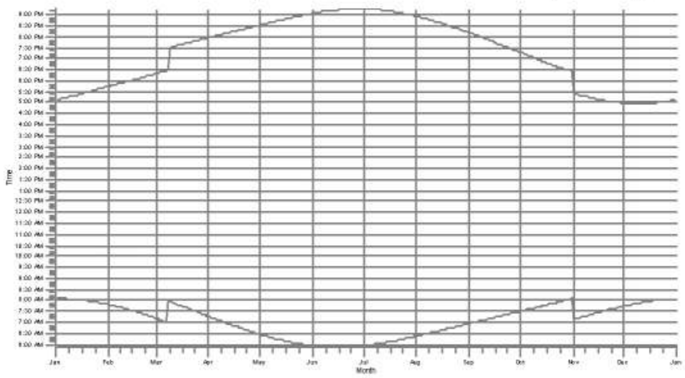
REC-001: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (1)



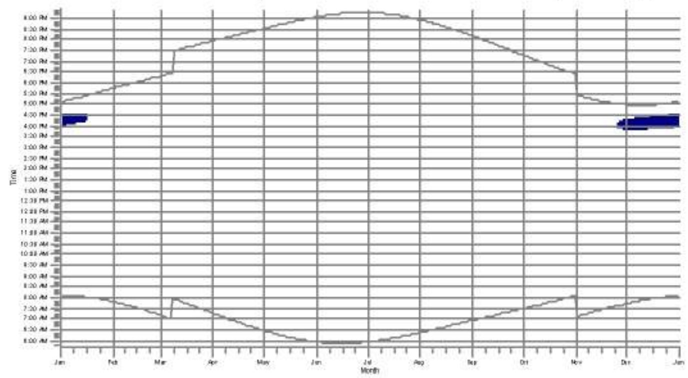
REC-002: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (2)



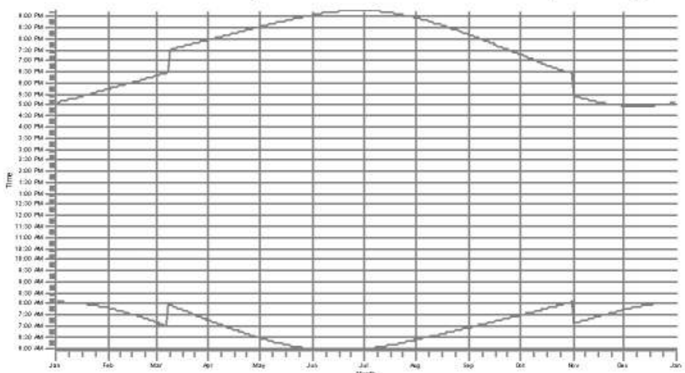
REC-003: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (3)



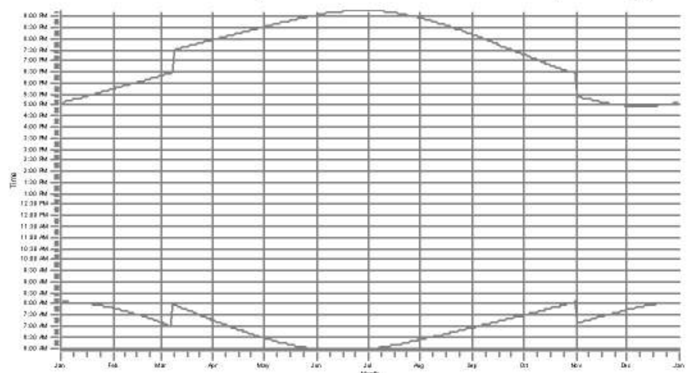
REC-004: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (4)



REC-005: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (5)



REC-006: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (6)



WTGs

1A.07: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (295)

Project:
sPower Shadow Flicker

Description:
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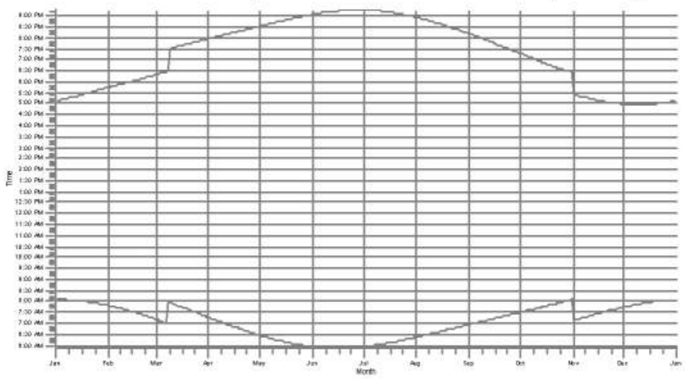
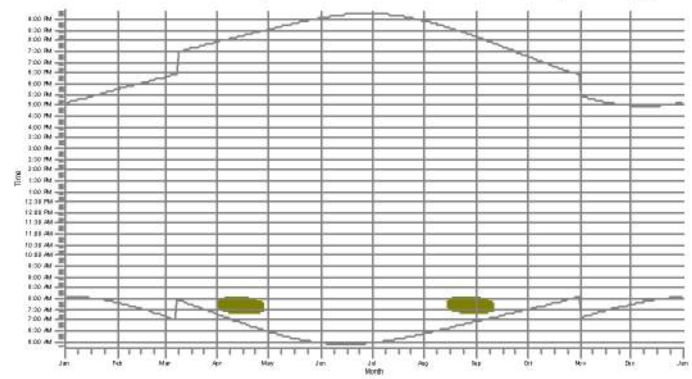
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

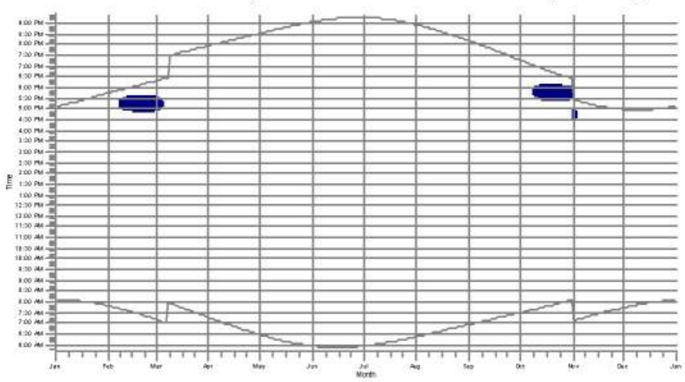
REC-007: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (7)



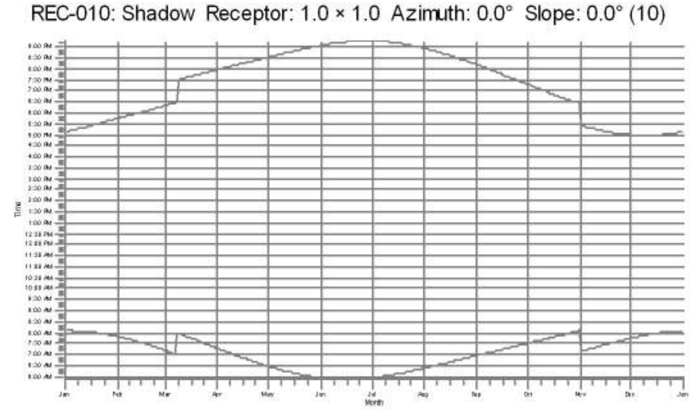
REC-008: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (8)



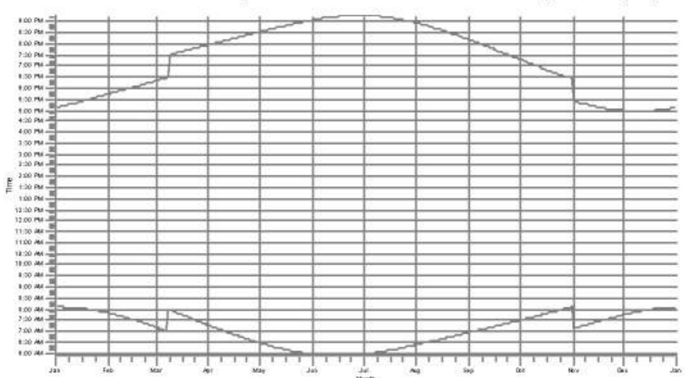
REC-009: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (9)



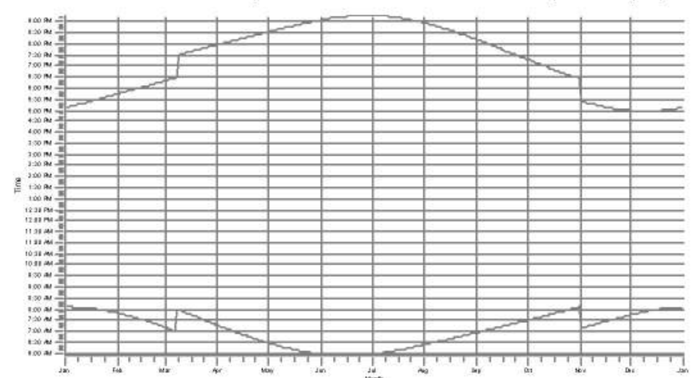
REC-010: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (10)



REC-011: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (11)



REC-012: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (12)



WTGs

1A.07: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (295)

1B.10: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (298)

Project:
sPower Shadow Flicker

Description:
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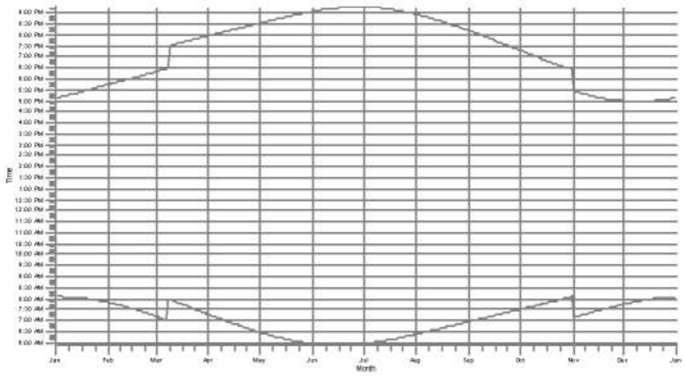
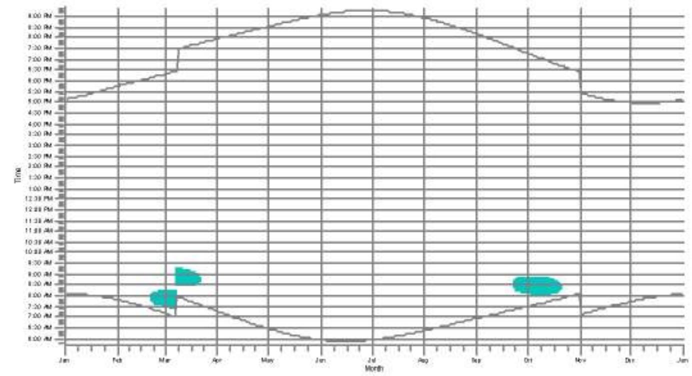
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

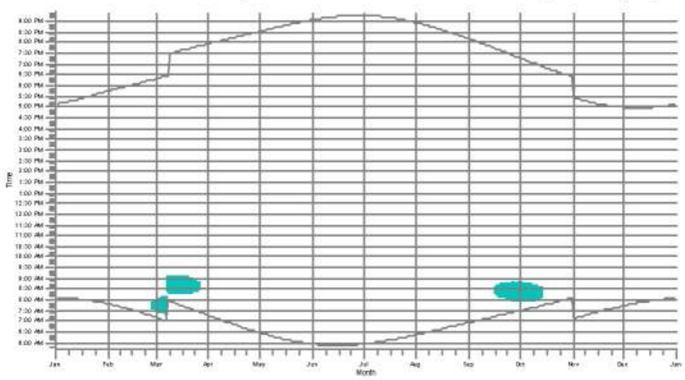
REC-013: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (13)



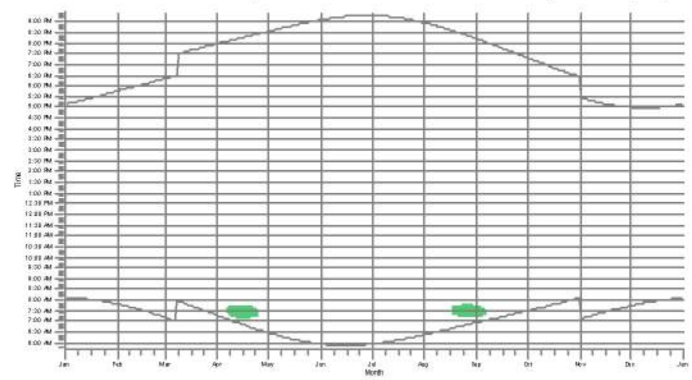
REC-014: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (14)



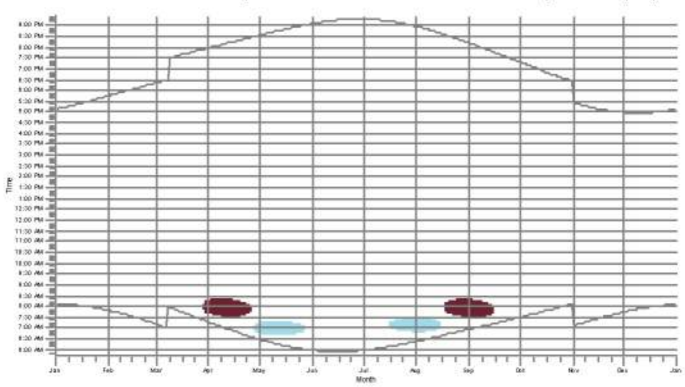
REC-015: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (15)



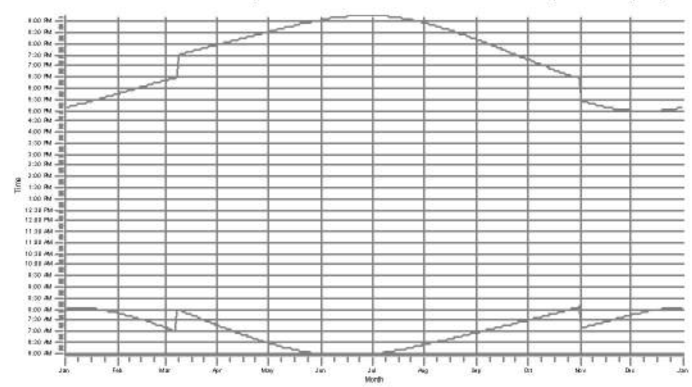
REC-016: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (16)



REC-017: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (17)



REC-018: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (18)



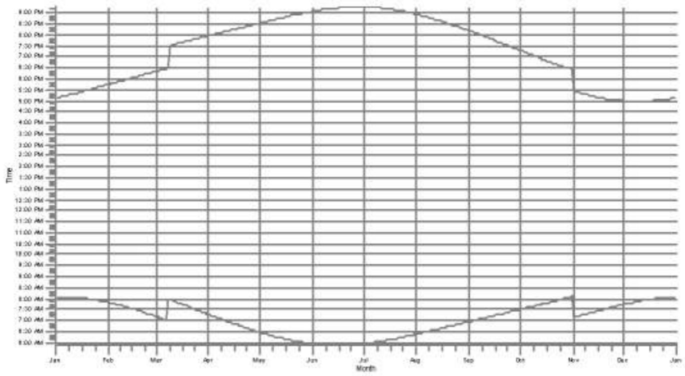
WTGs

2A.21: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (309)
2B.28: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (316)
3A.32: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (320)
3A.33: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (321)

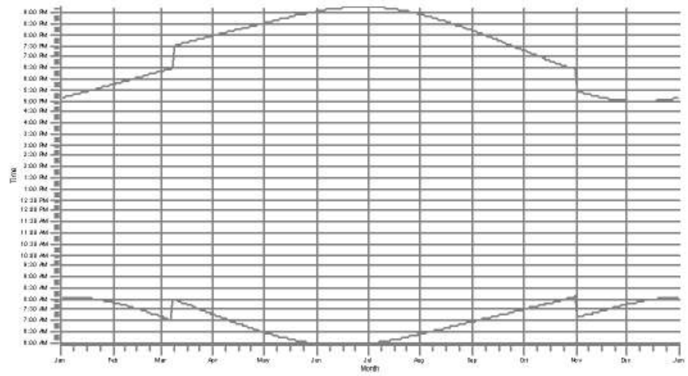
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

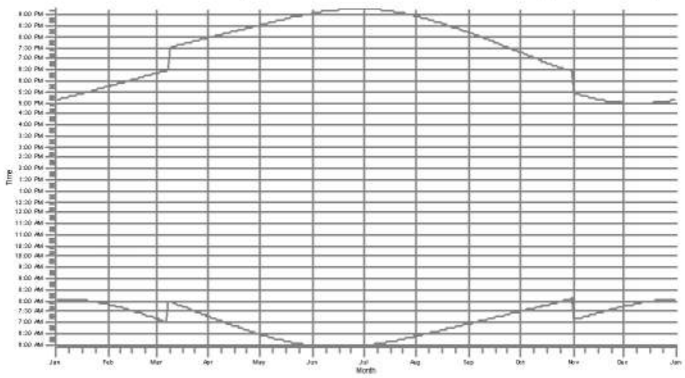
REC-019: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (19)



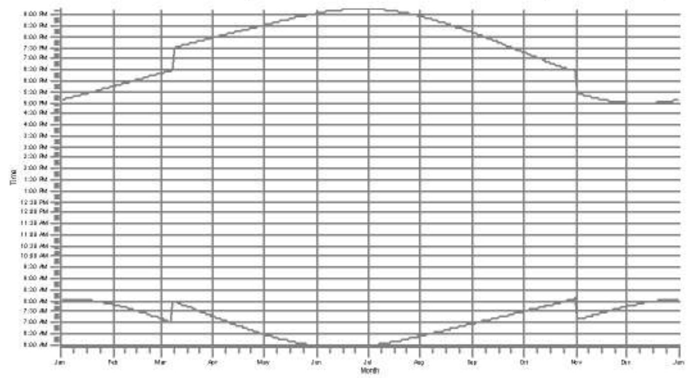
REC-020: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (20)



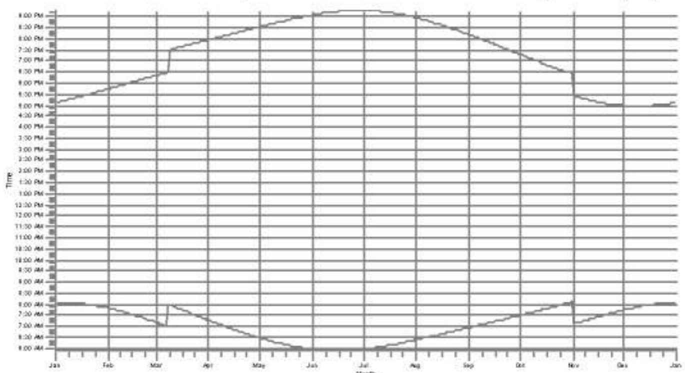
REC-021: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (21)



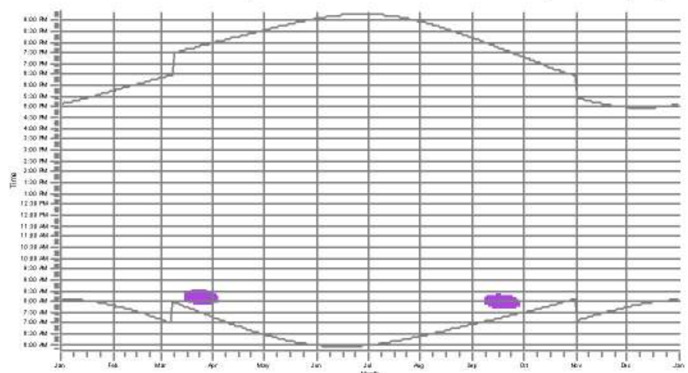
REC-022: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (22)



REC-023: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (23)



REC-024: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (24)



WTGs

38.43: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (331)

Project:
sPower Shadow Flicker

Description:
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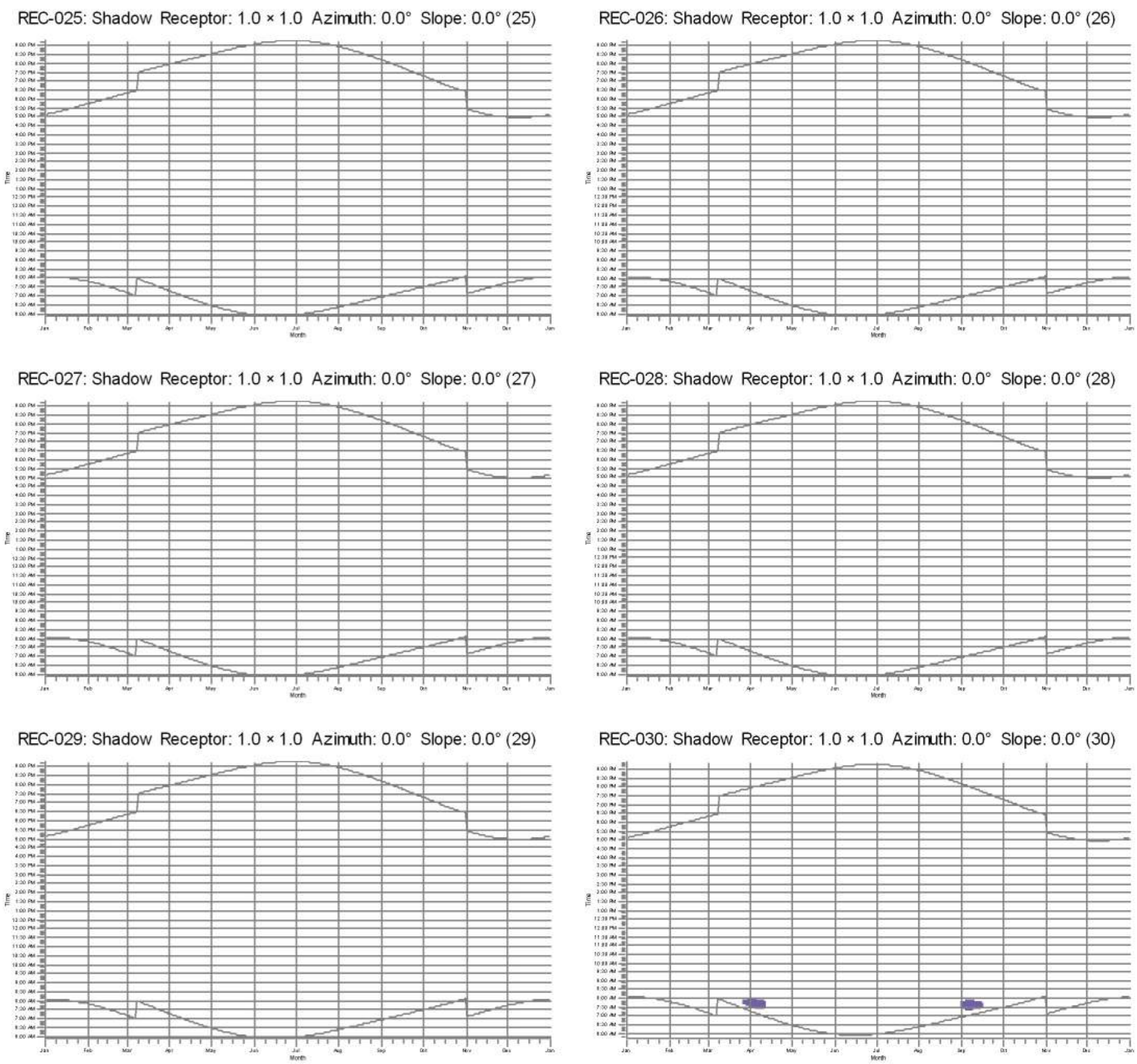
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap



WTGs

4A.44: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (332)

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Calculated:
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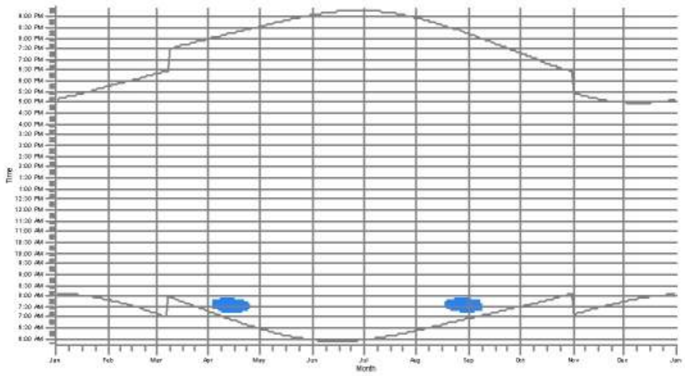
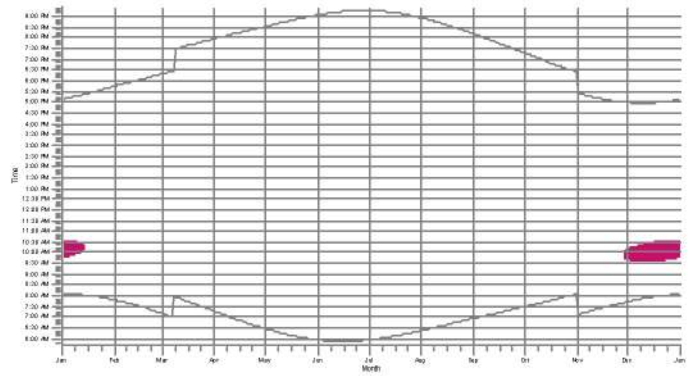
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

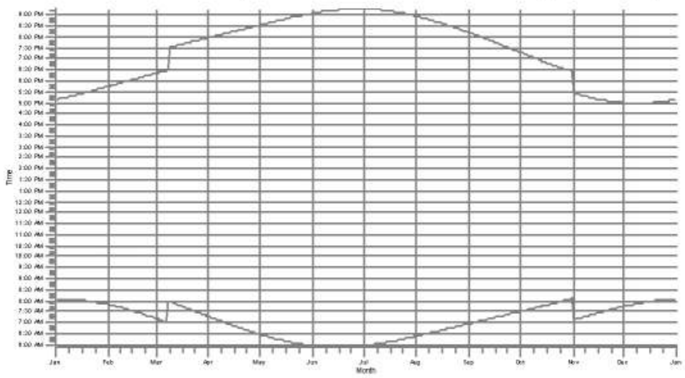
REC-031: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (31)



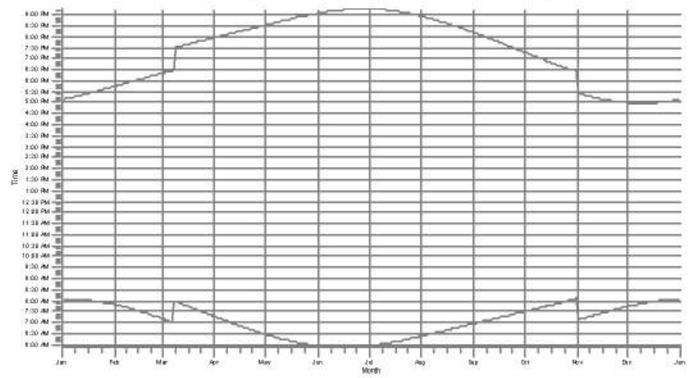
REC-032: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (32)



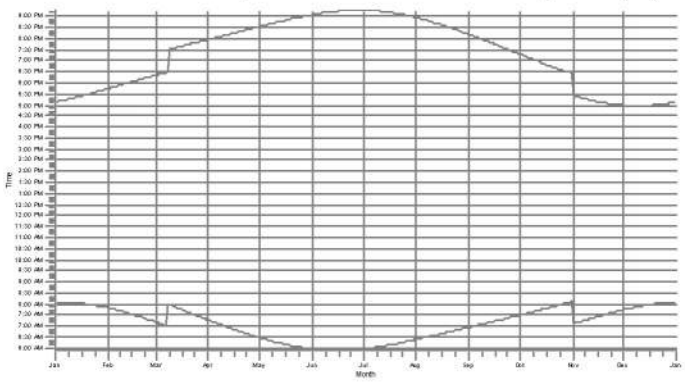
REC-033: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (33)



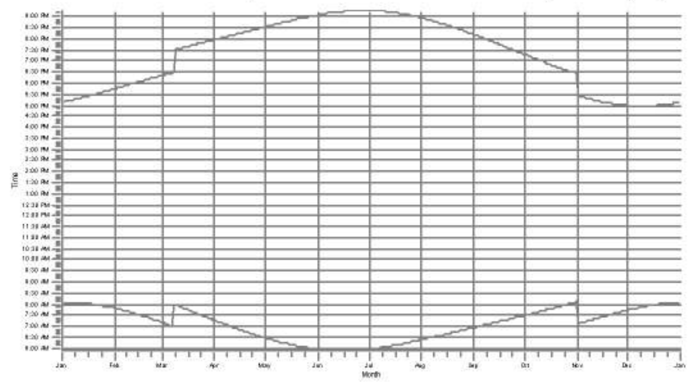
REC-034: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (34)



REC-035: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (35)



REC-036: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (36)



WTGs

38.39: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (327)

48.50: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (338)

Project:
sPower Shadow Flicker

Description:
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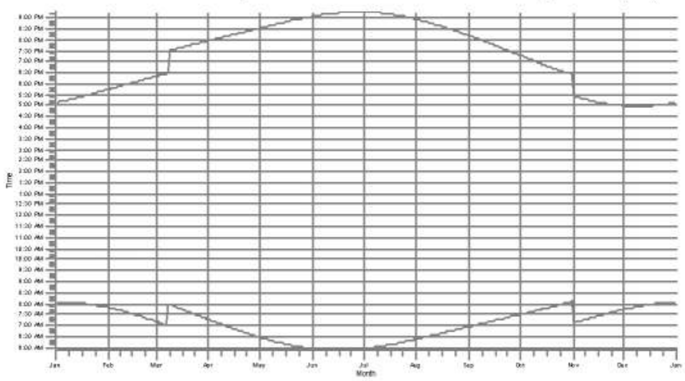
10/3/2018 3:53 PM/3.0.654

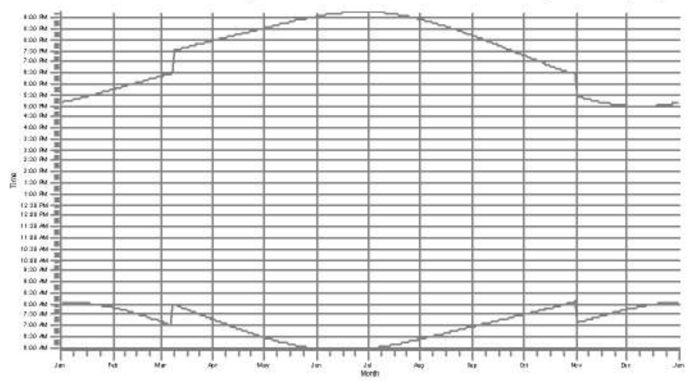
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

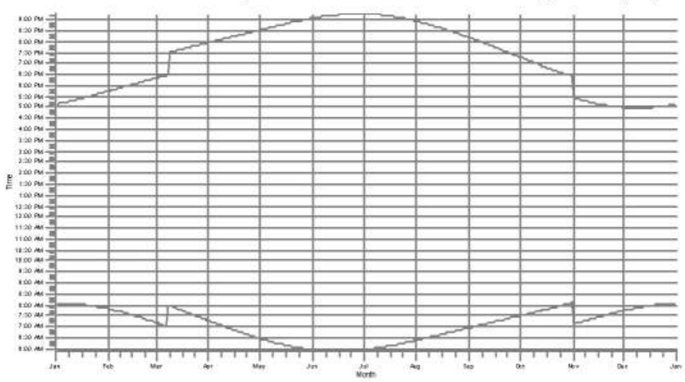
REC-037: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (37)



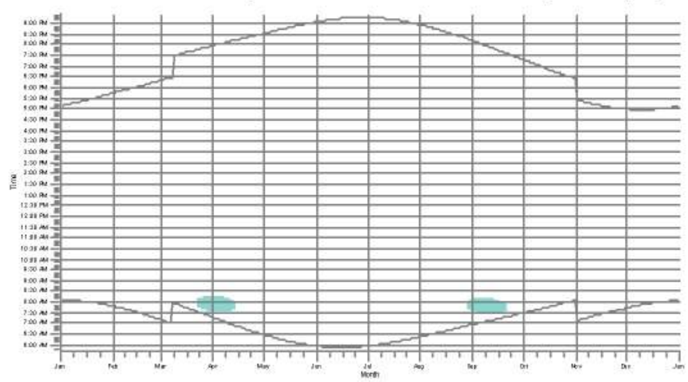
REC-038: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (38)



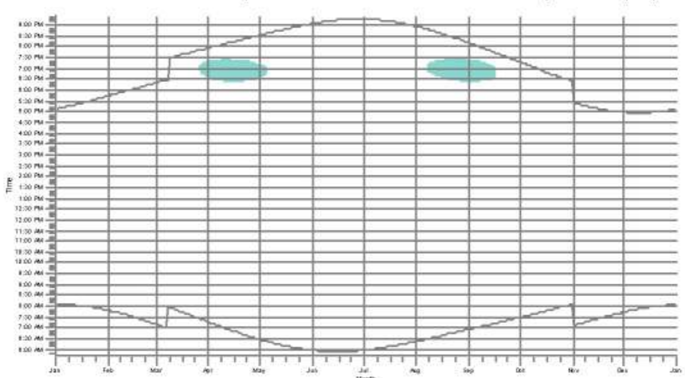
REC-039: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (39)



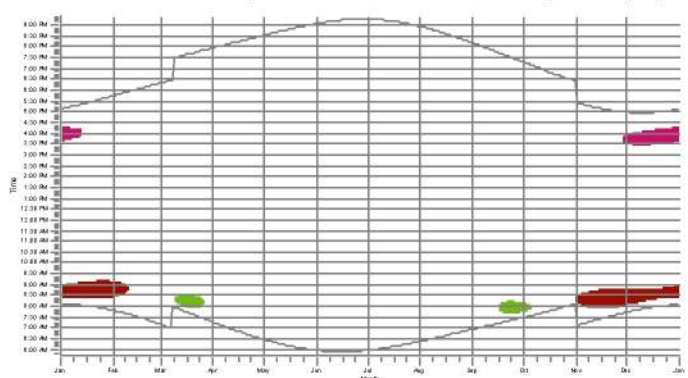
REC-040: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (40)



REC-041: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (41)



REC-042: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (42)



WTGs

4A.48: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (336)
4B.50: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (338)
4B.51: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (339)
4B.52: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (340)

Project:
sPower Shadow Flicker

Description:
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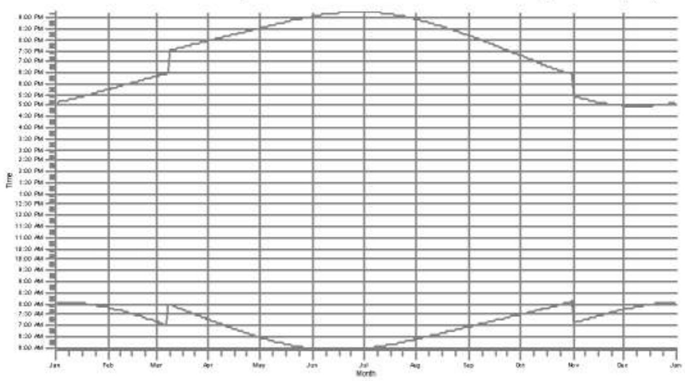
Calculated:
10/3/2018 3:53 PM/3.0.654

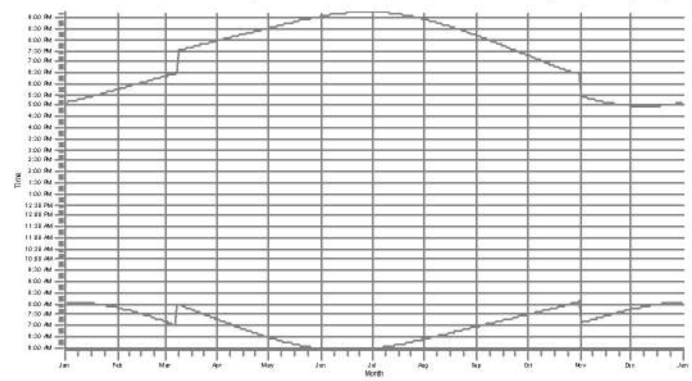
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

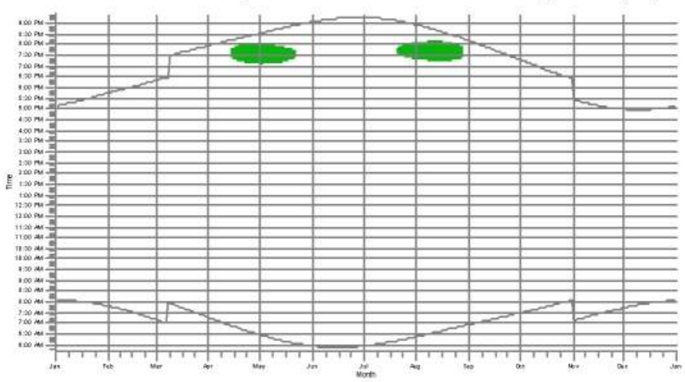
REC-043: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (43)



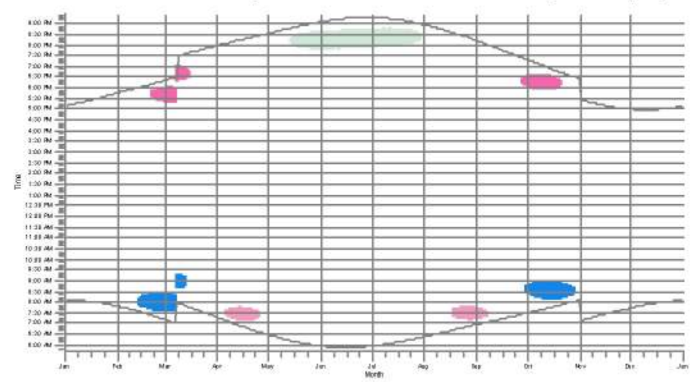
REC-044: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (44)



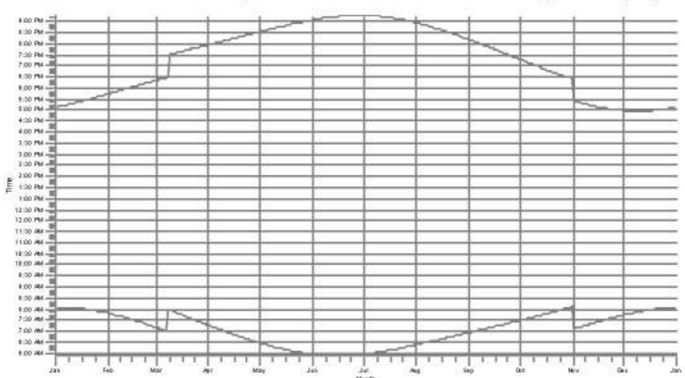
REC-045: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (45)



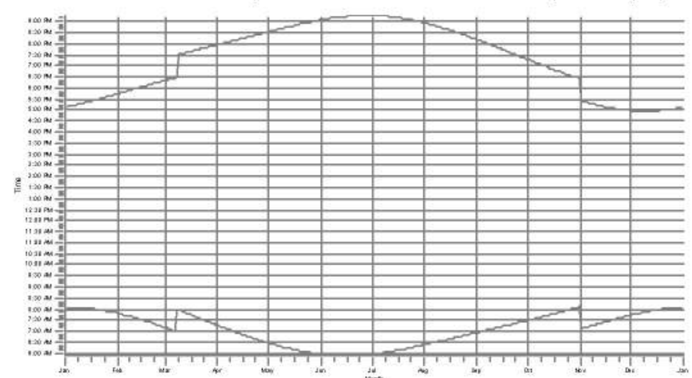
REC-046: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (46)



REC-047: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (47)



REC-048: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (48)



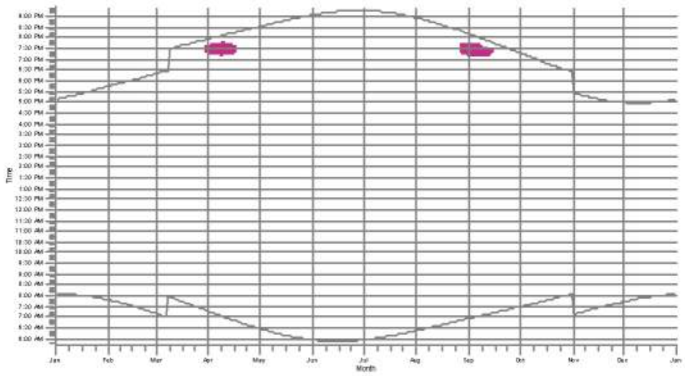
WTGs

4B.54: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (342)
5A.59: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (347)
5A.60: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (348)
5A.61: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (349)
5A.62: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (350)

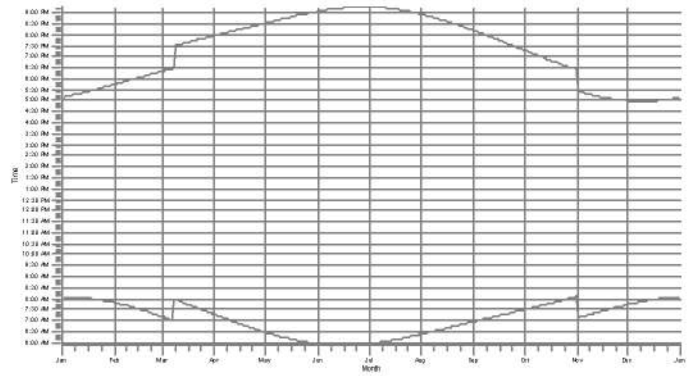
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

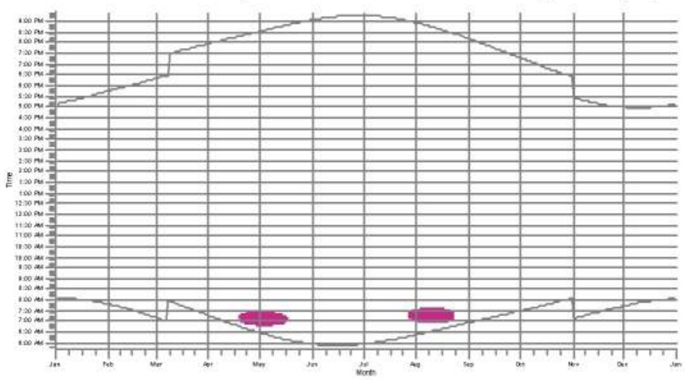
REC-049: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (49)



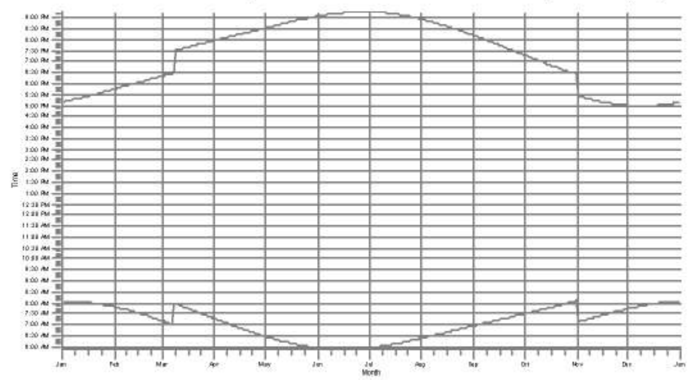
REC-050: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (50)



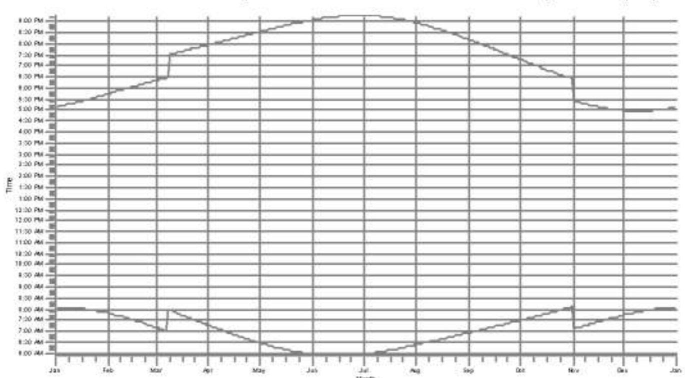
REC-051: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (51)



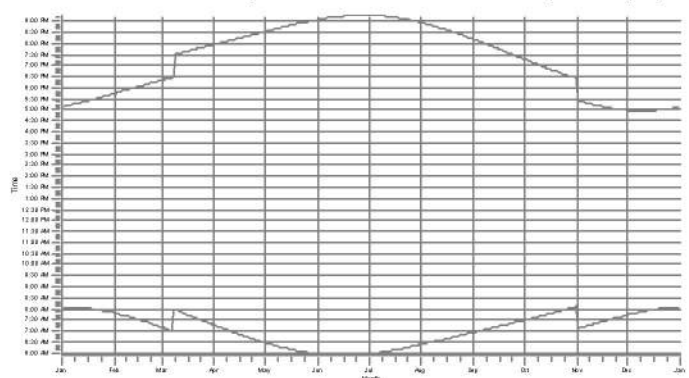
REC-052: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (52)



REC-053: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (53)



REC-054: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (54)



WTGs

48.57: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (345)

Project:
sPower Shadow Flicker

Description:
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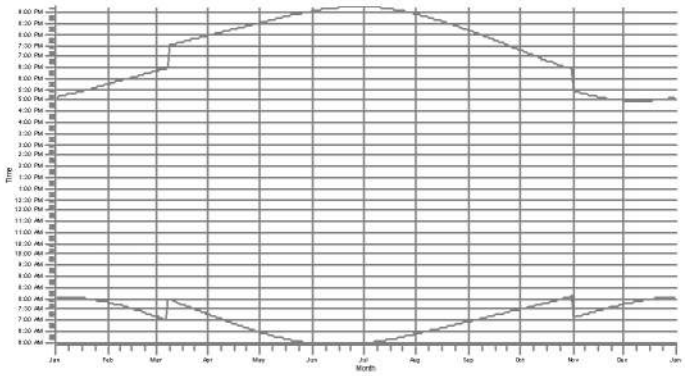
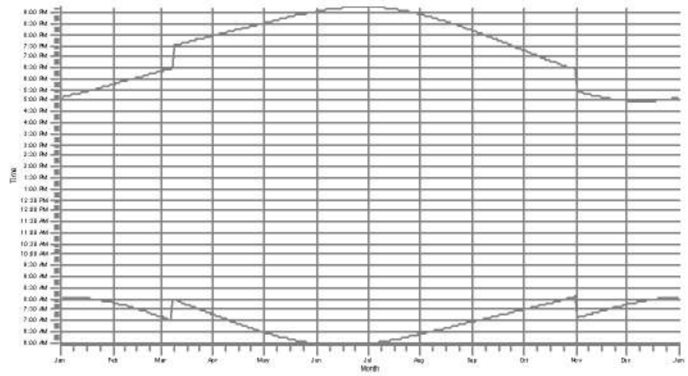
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

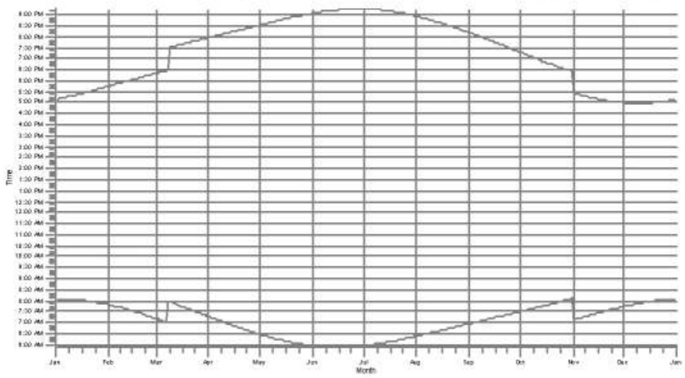
REC-055: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (55)



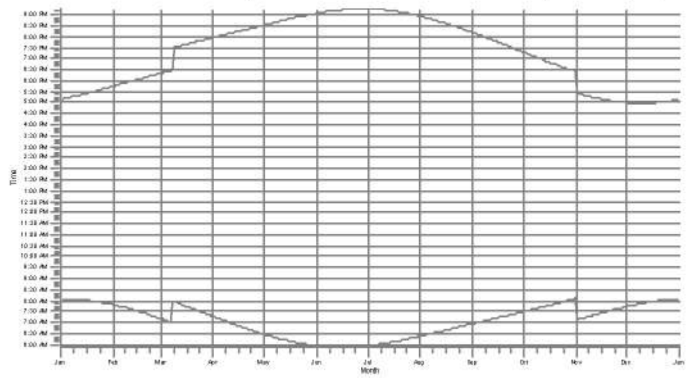
REC-056: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (56)



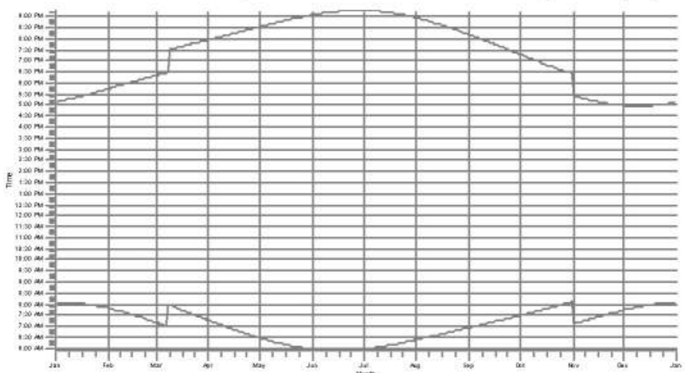
REC-057: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (57)



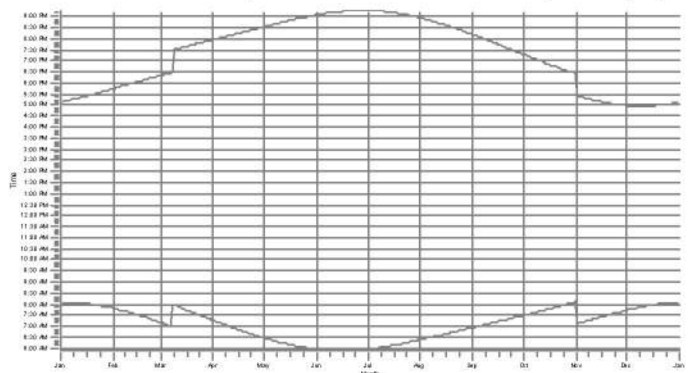
REC-058: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (58)



REC-059: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (59)



REC-060: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (60)



WTGs

Project:
sPower Shadow Flicker

Description:
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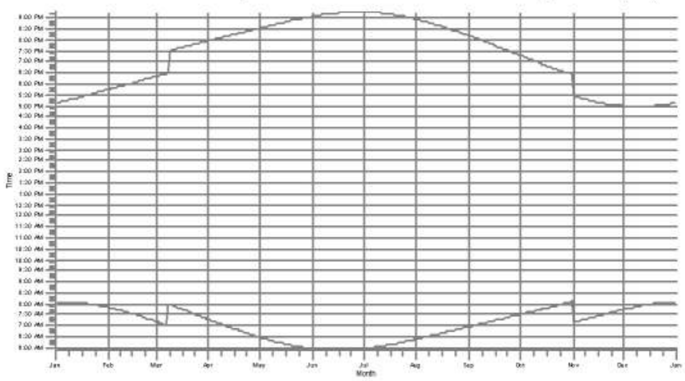
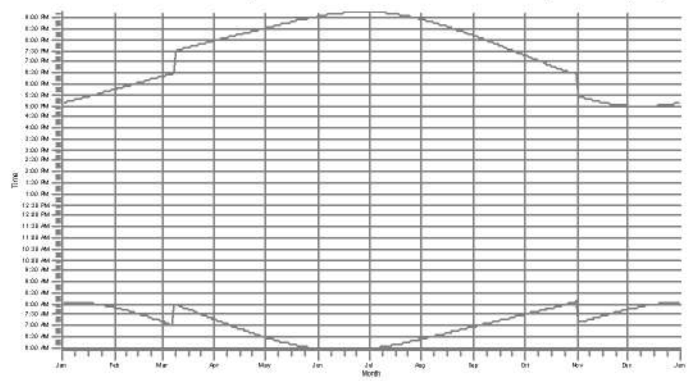
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

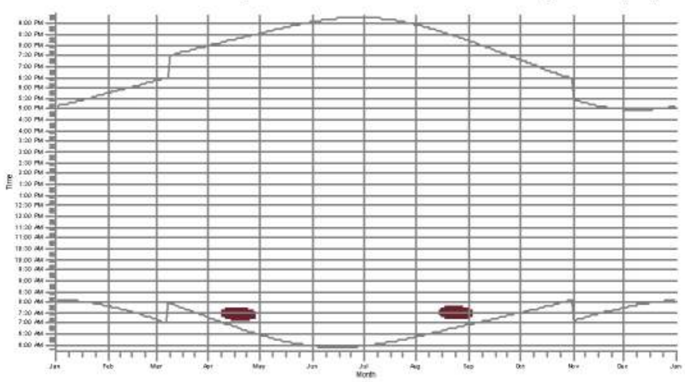
REC-061: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (61)



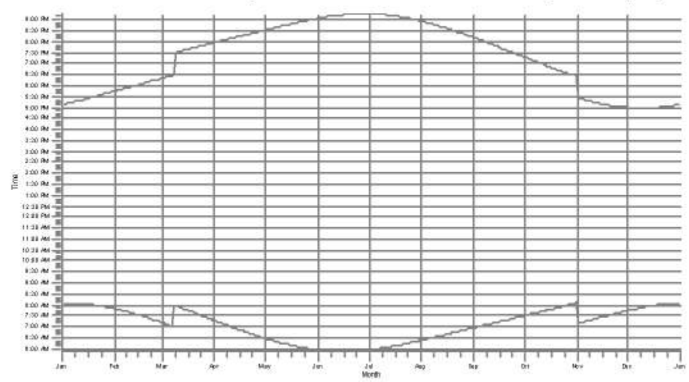
REC-062: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (62)



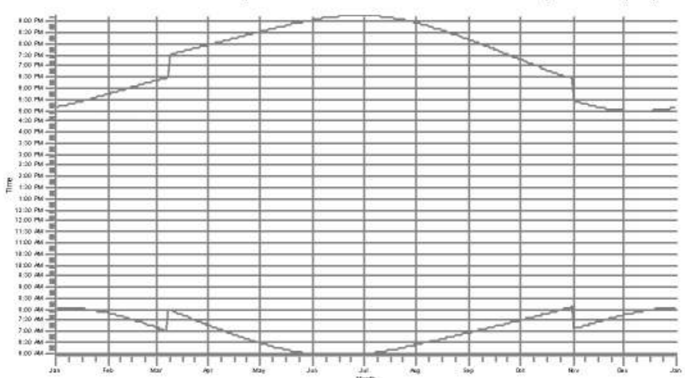
REC-063: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (63)



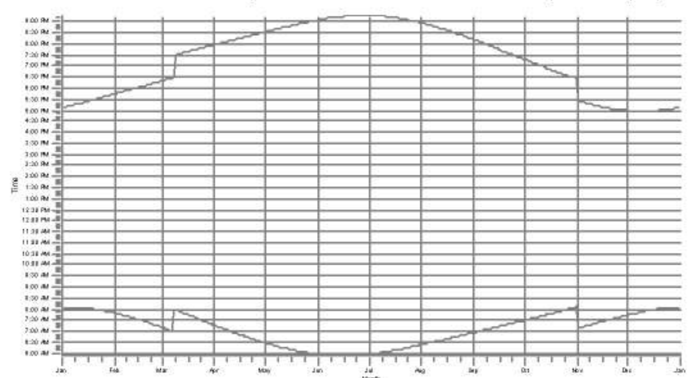
REC-064: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (64)



REC-065: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (65)



REC-066: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (66)



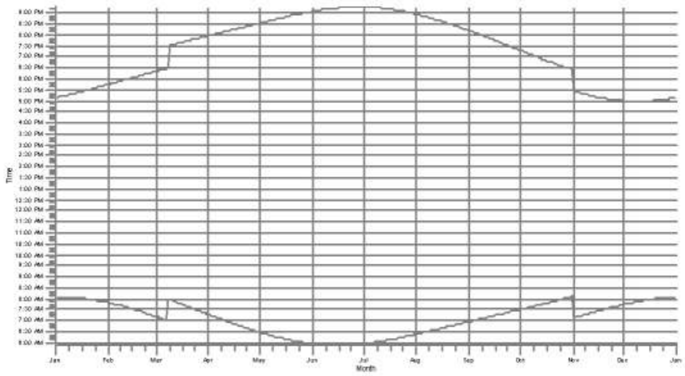
WTGs

3A.32: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (320)

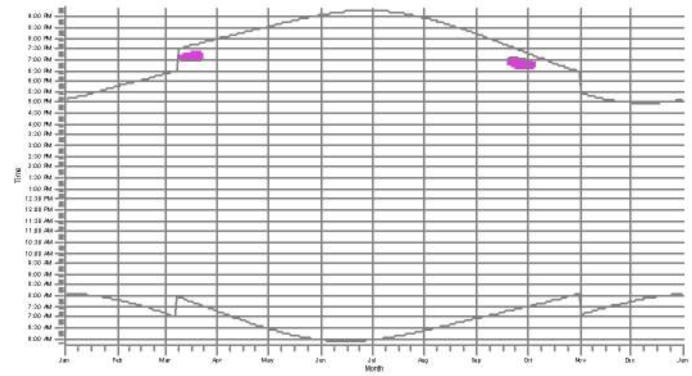
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

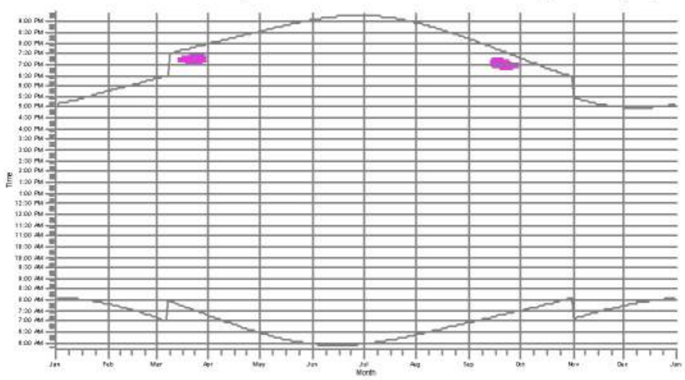
REC-067: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (67)



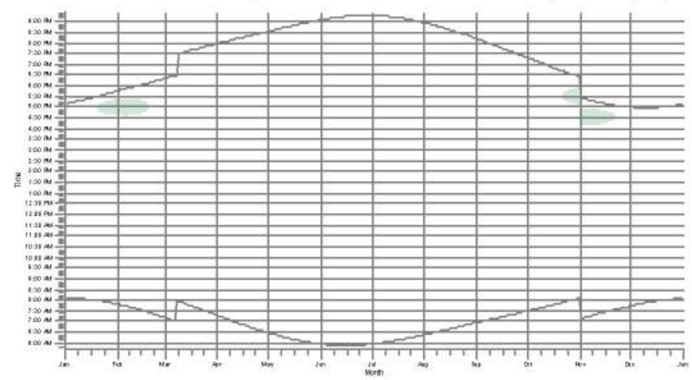
REC-068: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (68)



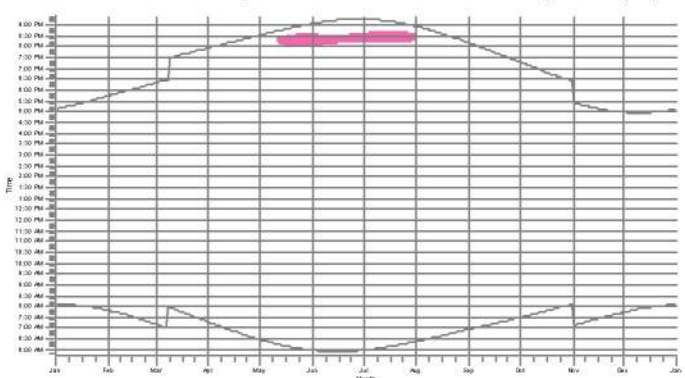
REC-069: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (69)



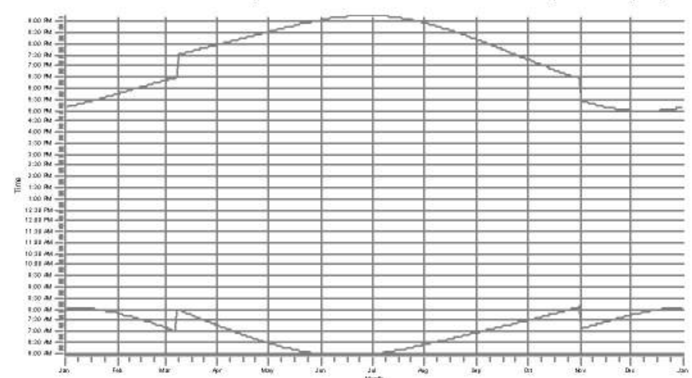
REC-070: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (70)



REC-071: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (71)



REC-072: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (72)



WTGs

3A.35: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (323)

5A.60: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (348)

5A.61: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (349)

Project:
sPower Shadow Flicker

Description:
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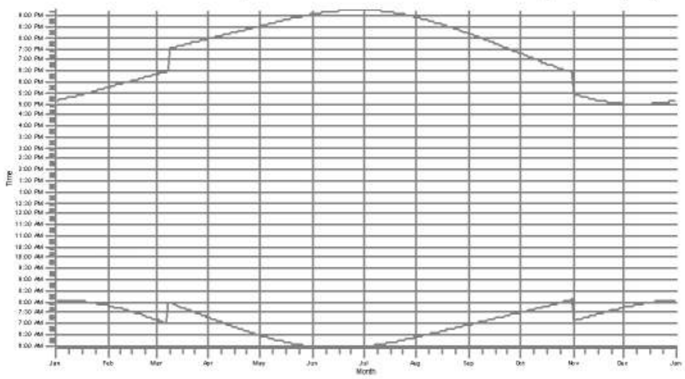
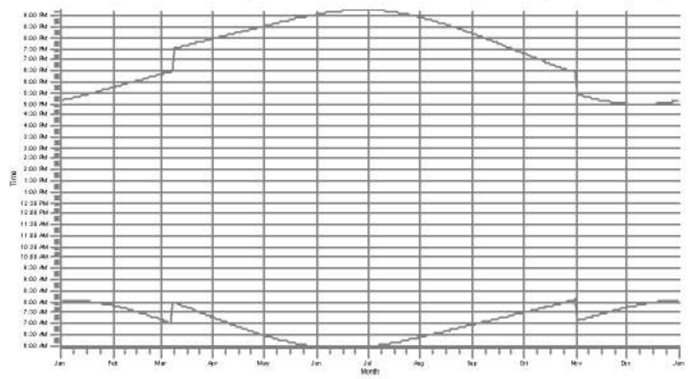
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

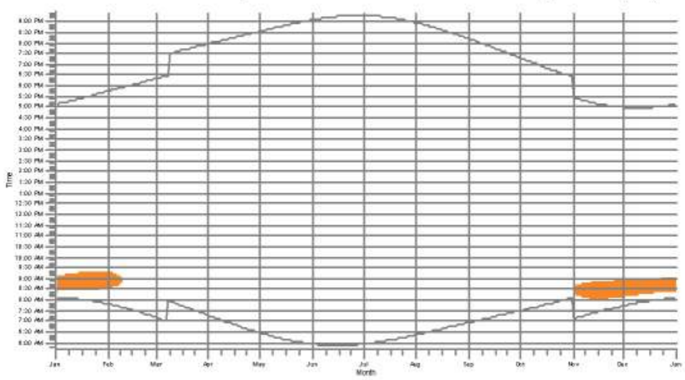
REC-073: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (73)



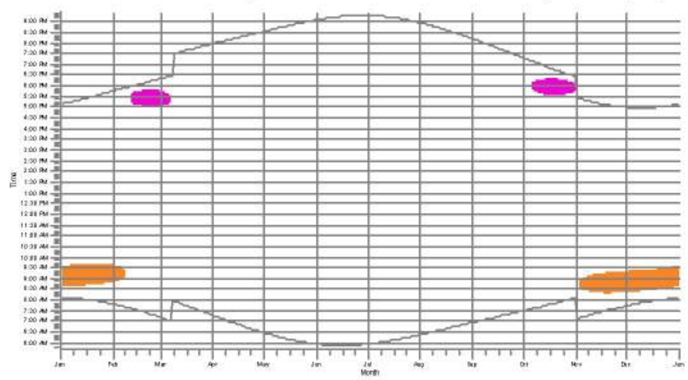
REC-074: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (74)



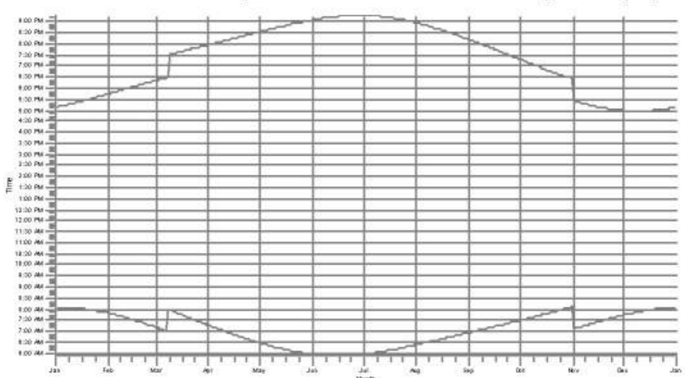
REC-075: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (75)



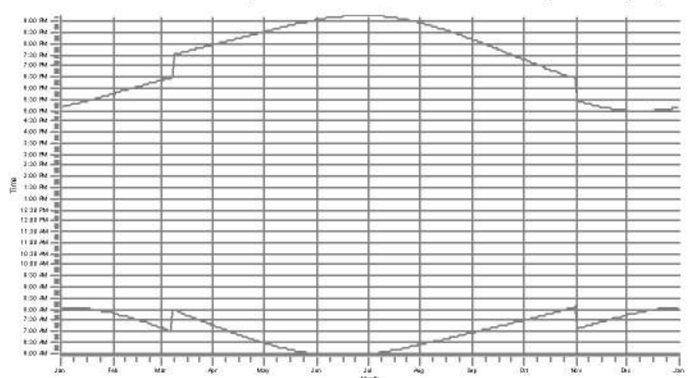
REC-076: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (76)



REC-077: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (77)



REC-078: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (78)



WTGs

28.23: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (311)

28.24: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (312)

Project:
sPower Shadow Flicker

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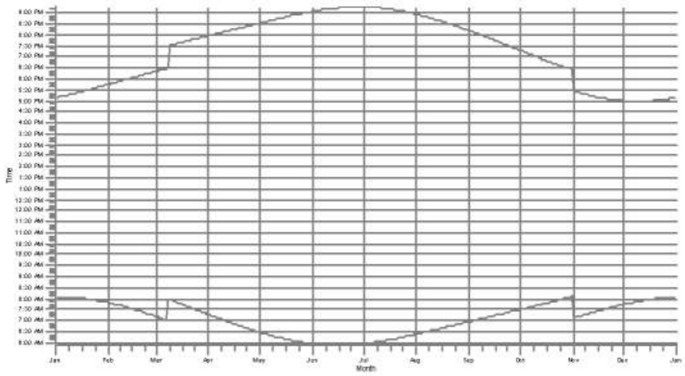
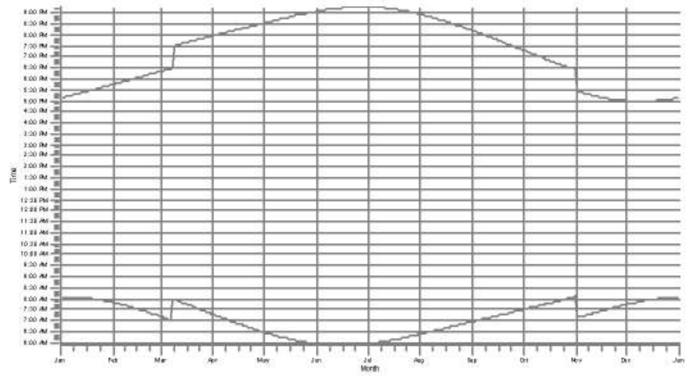
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

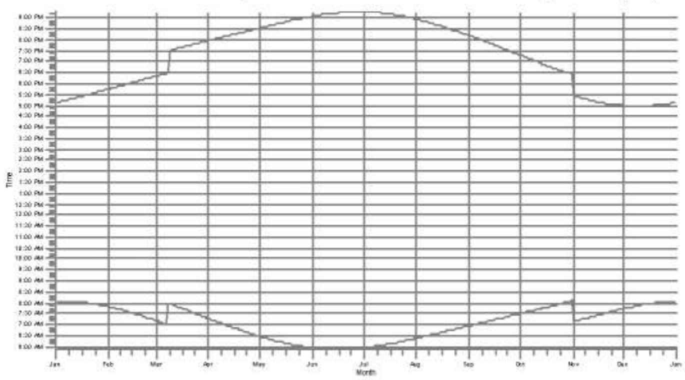
REC-079: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (79)



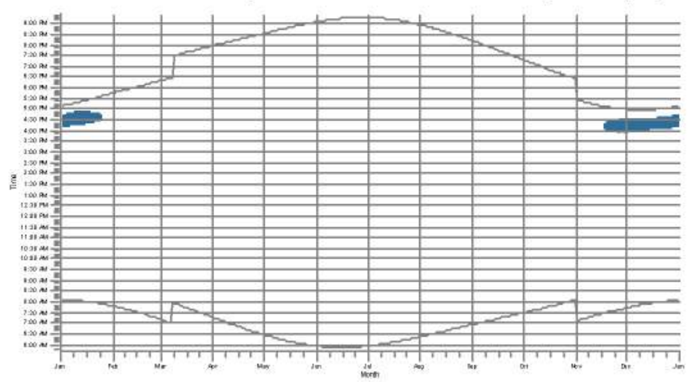
REC-080: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (80)



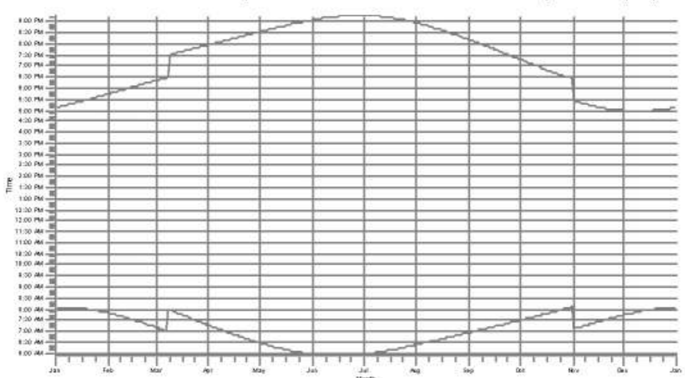
REC-081: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (81)



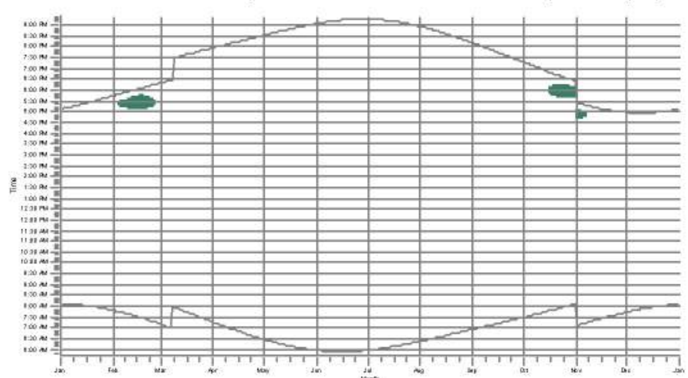
REC-082: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (82)



REC-083: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (83)



REC-084: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (84)



WTGs

2B.22: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (310)

3A.29: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (317)

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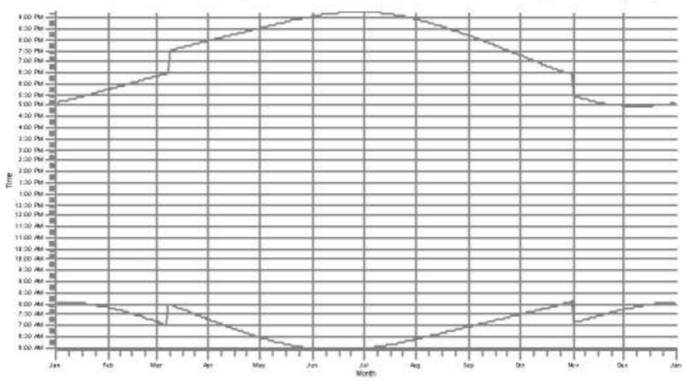
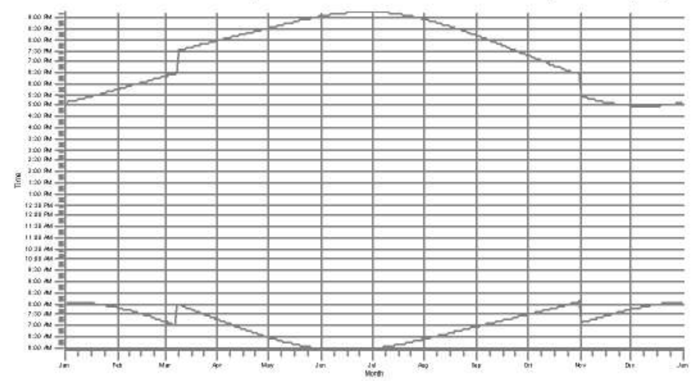
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

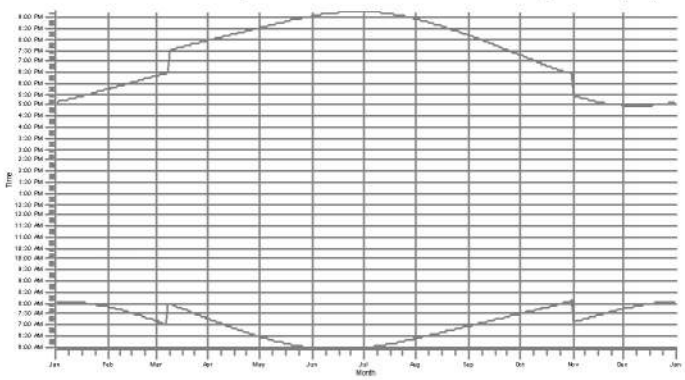
REC-085: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (85)



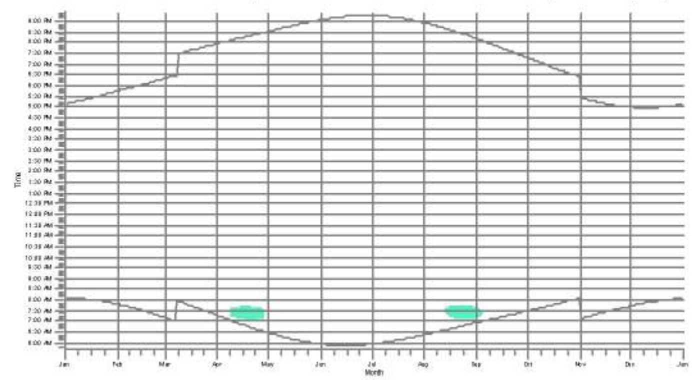
REC-086: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (86)



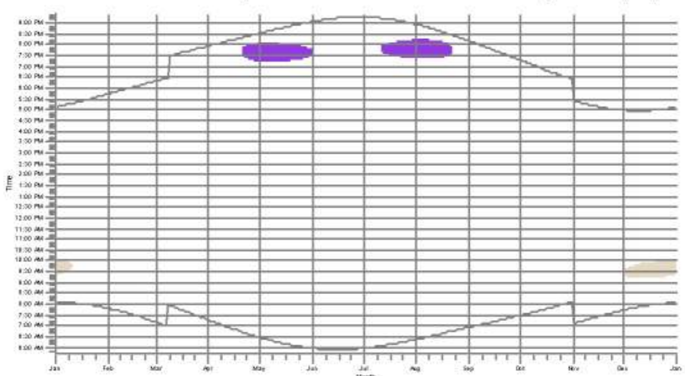
REC-087: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (87)



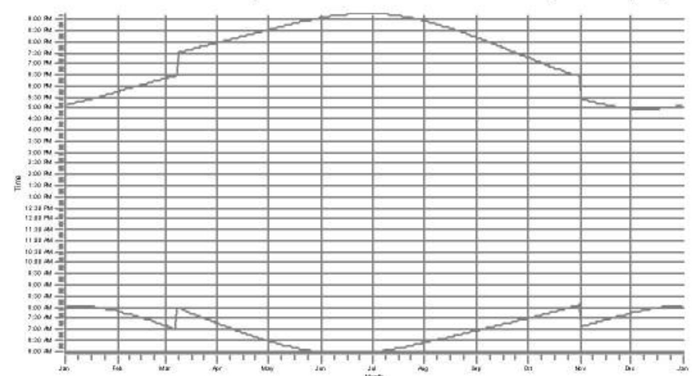
REC-088: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (88)



REC-089: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (89)



REC-090: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (90)



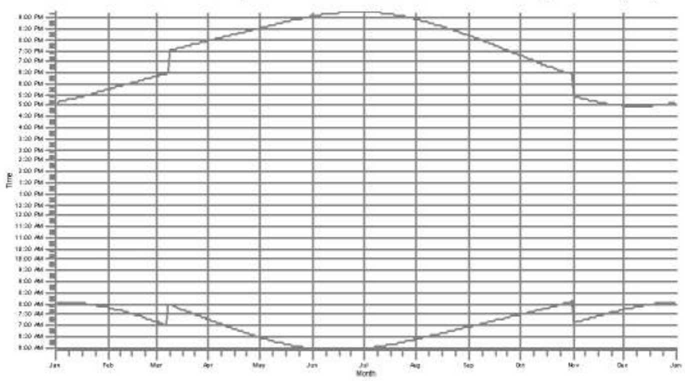
WTGs

- 4A.46: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (334)
- 4A.49: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (337)
- 4B.56: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (344)

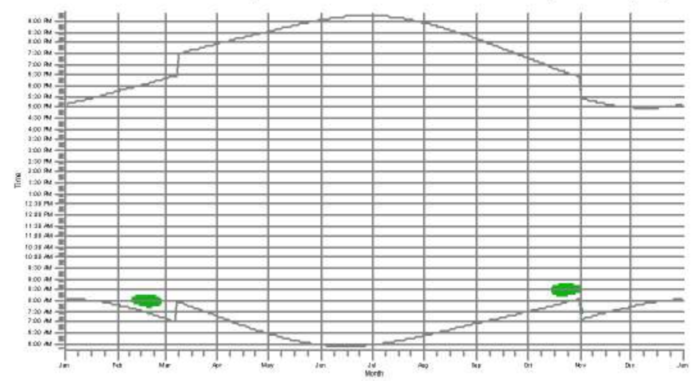
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

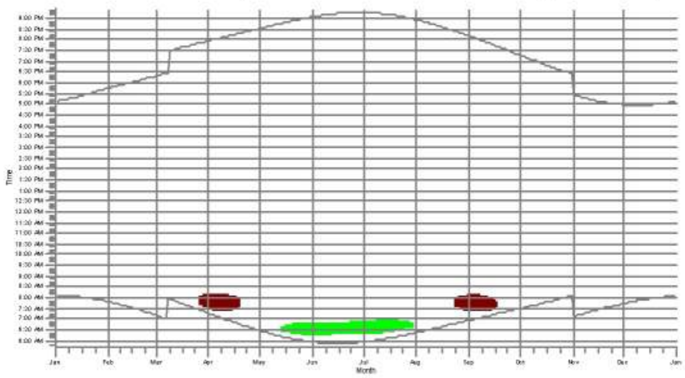
REC-091: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (91)



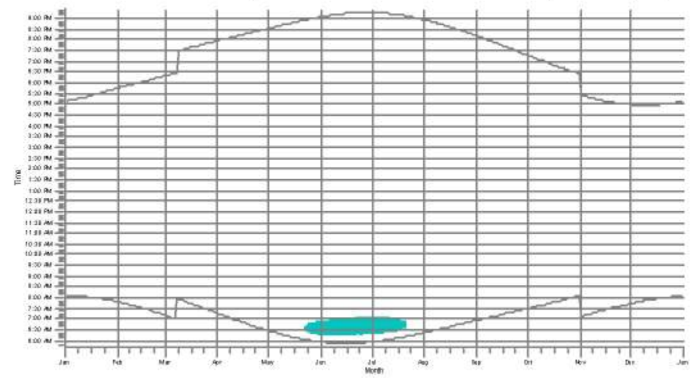
REC-092: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (92)



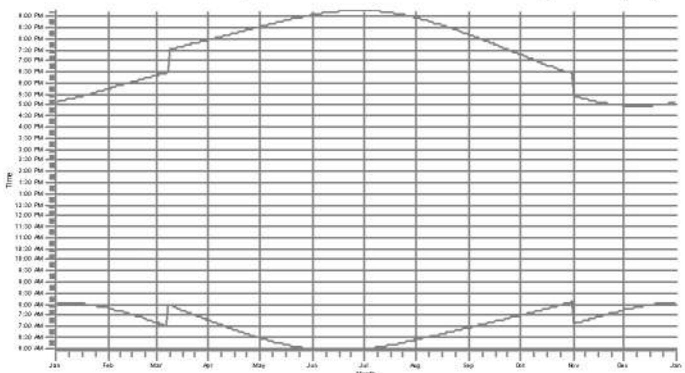
REC-093: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (93)



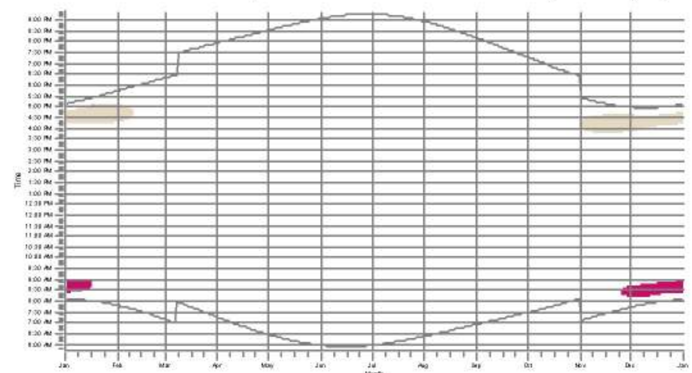
REC-094: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (94)



REC-095: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (95)



REC-096: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (96)



WTGs

- 1B.08: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (296)
- 1B.09: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (297)
- 2A.21: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (309)
- 4A.47: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (335)
- 4A.49: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (337)
- 4B.50: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (338)
- 4B.54: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (342)

Description:
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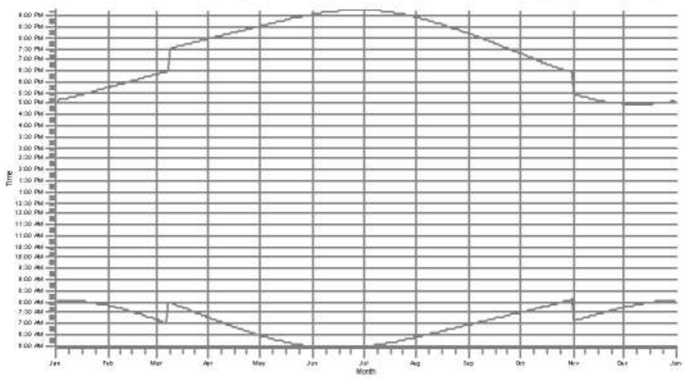
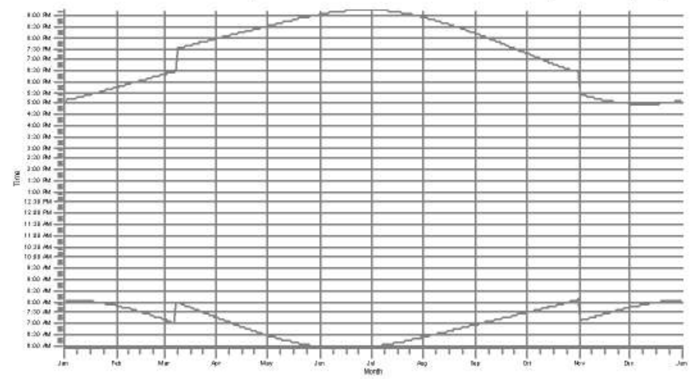
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

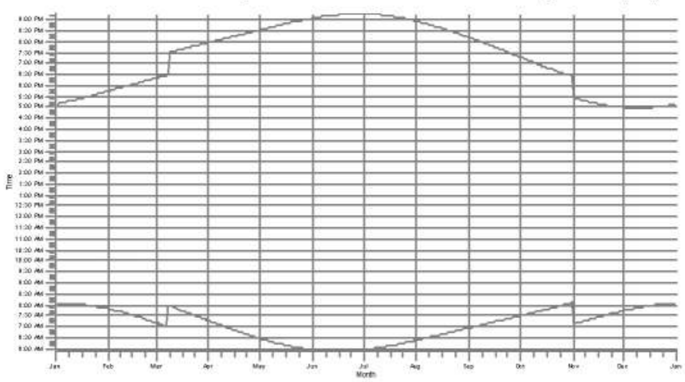
REC-097: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (97)



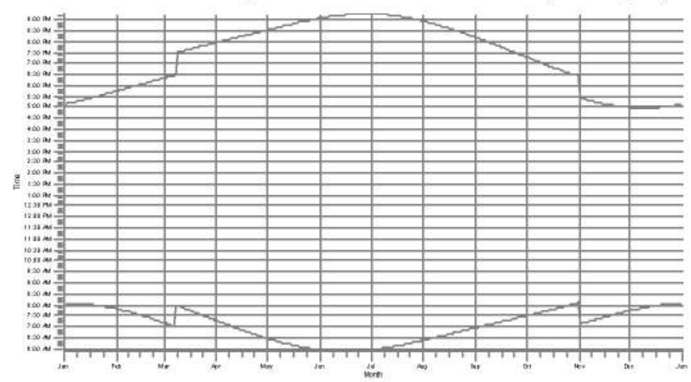
REC-098: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (98)



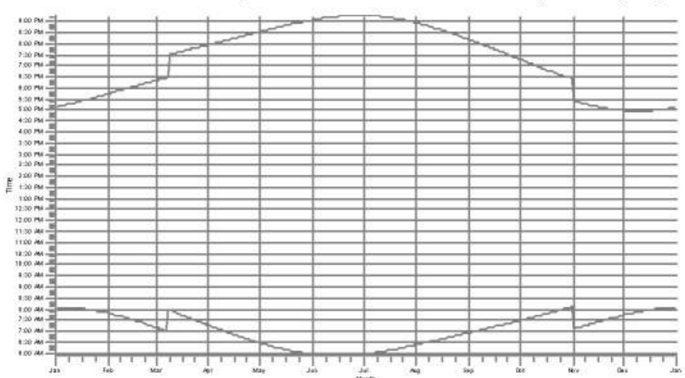
REC-099: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (99)



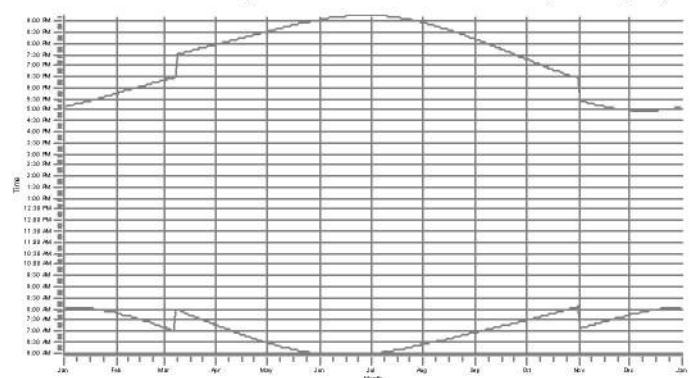
REC-100: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (100)



REC-101: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (101)



REC-102: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (102)

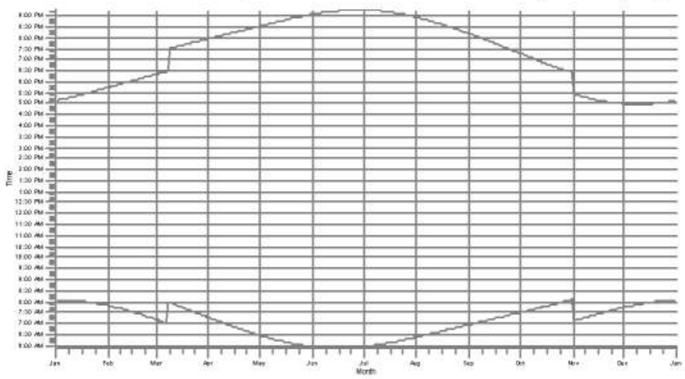


WTGs

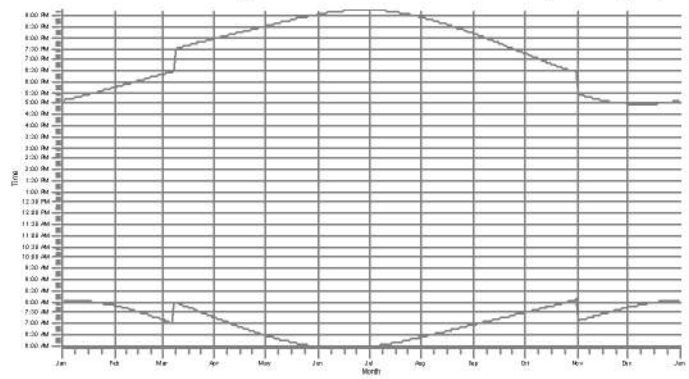
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

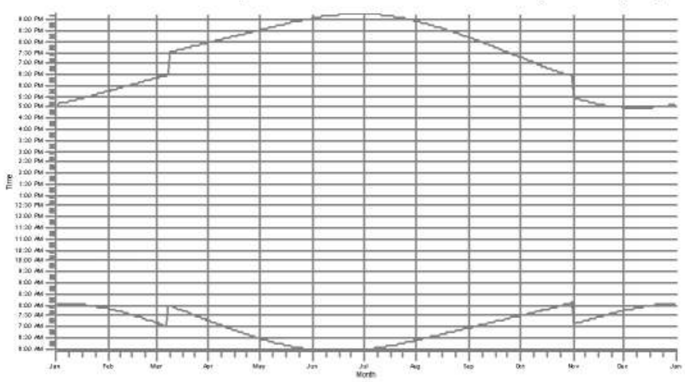
REC-103: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (103)



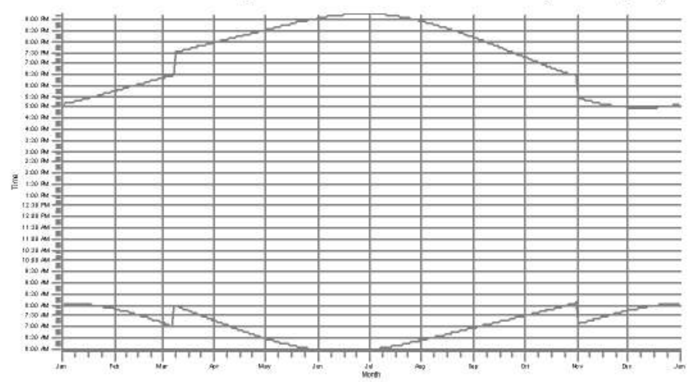
REC-104: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (104)



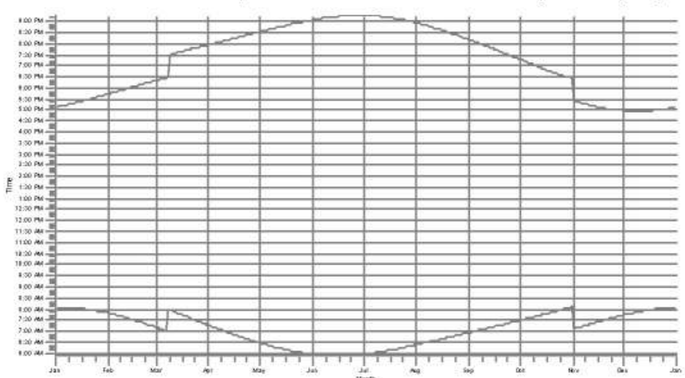
REC-105: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (105)



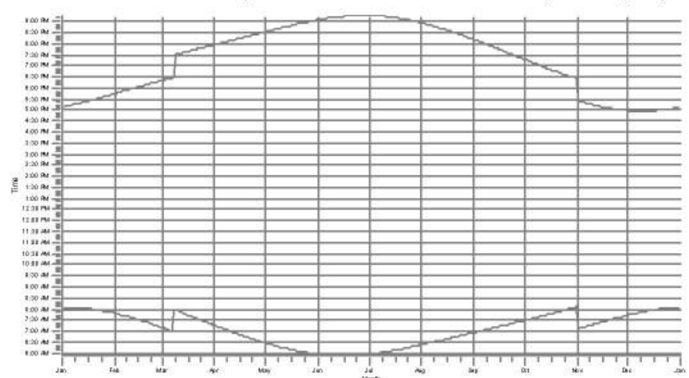
REC-106: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (106)



REC-107: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (107)



REC-108: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (108)



WTGs

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sPower Shadow Flicker

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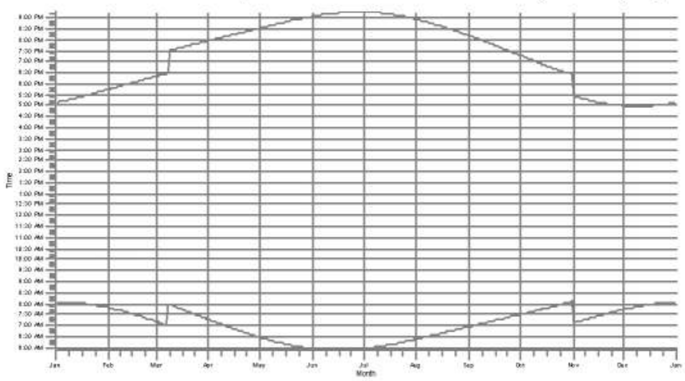
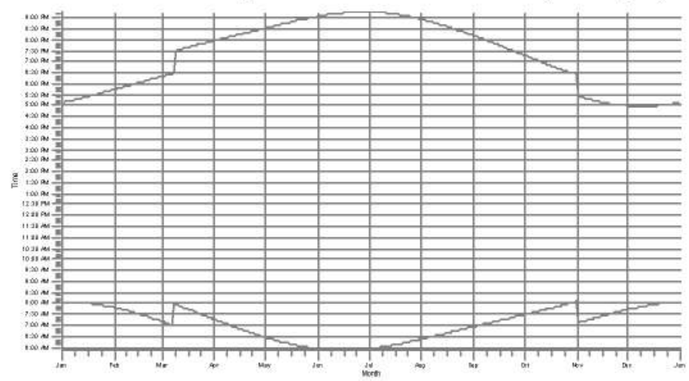
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

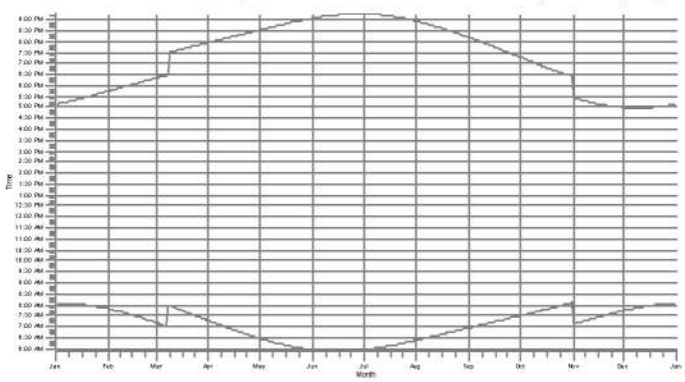
REC-109: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (109)



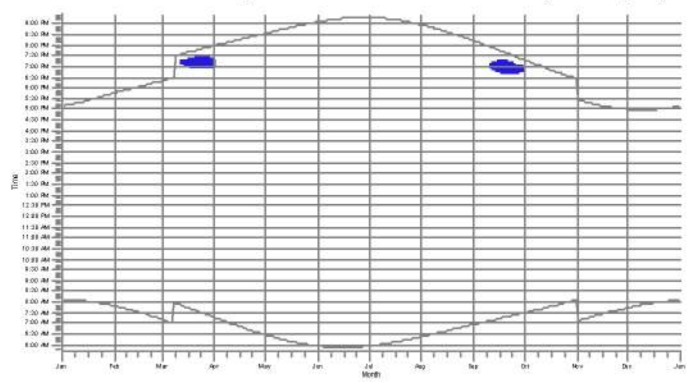
REC-110: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (110)



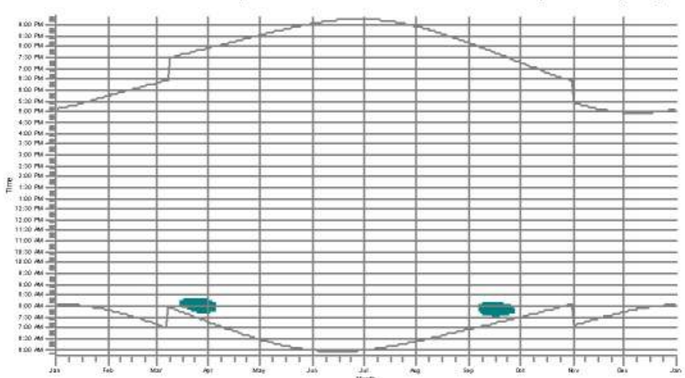
REC-111: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (111)



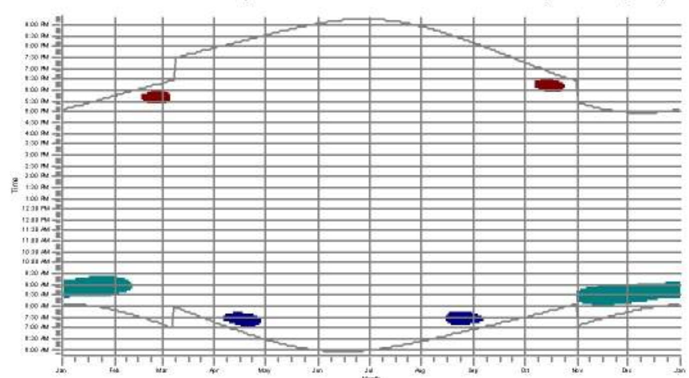
REC-112: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (112)



REC-113: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (113)



REC-114: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (114)



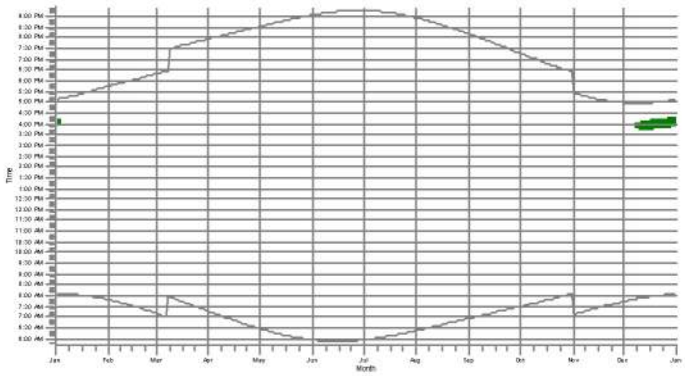
WTGs

1A.06: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (294)
1A.07: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (295)
1B.08: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (296)
3A.36: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (324)

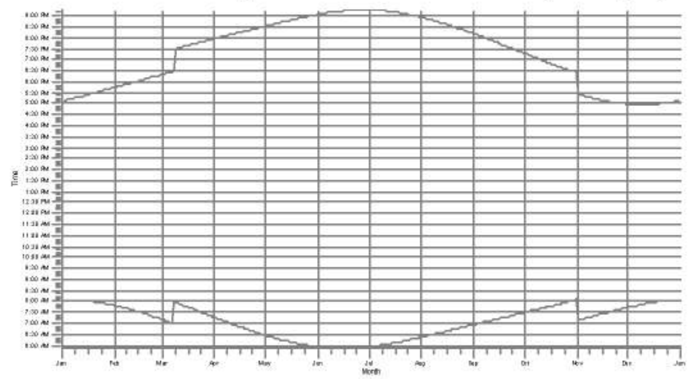
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

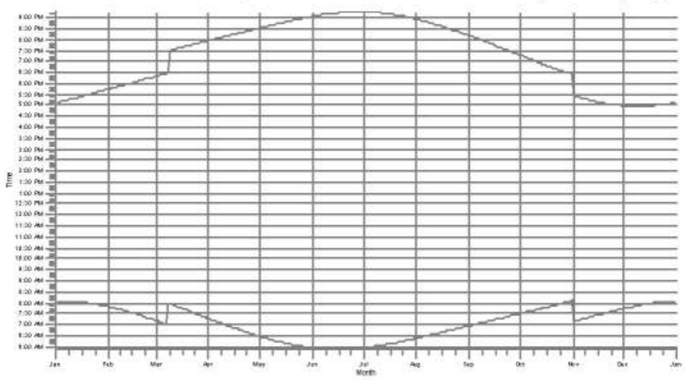
REC-115: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (115)



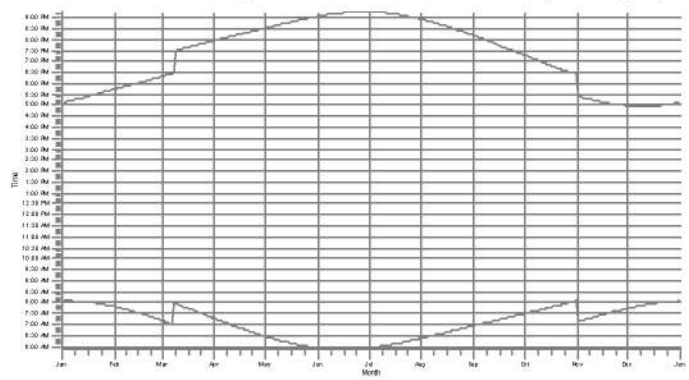
REC-116: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (116)



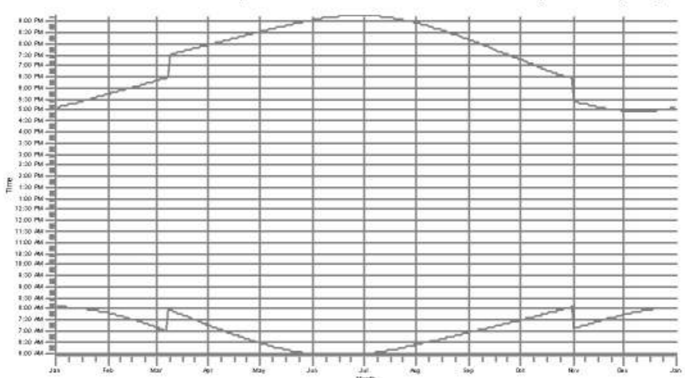
REC-117: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (117)



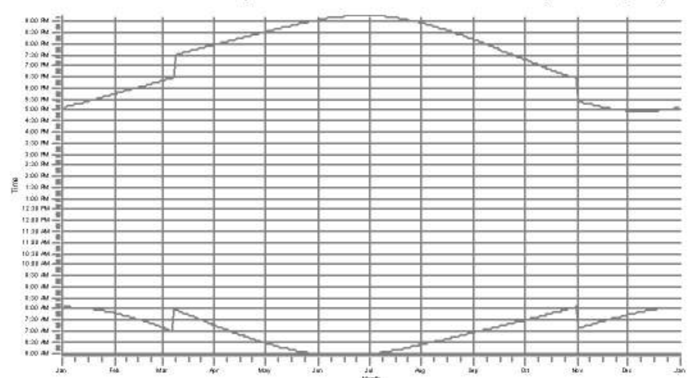
REC-118: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (118)



REC-119: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (119)



REC-120: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (120)



WTGs

1A.01: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (289)

Project:
sPower Shadow Flicker

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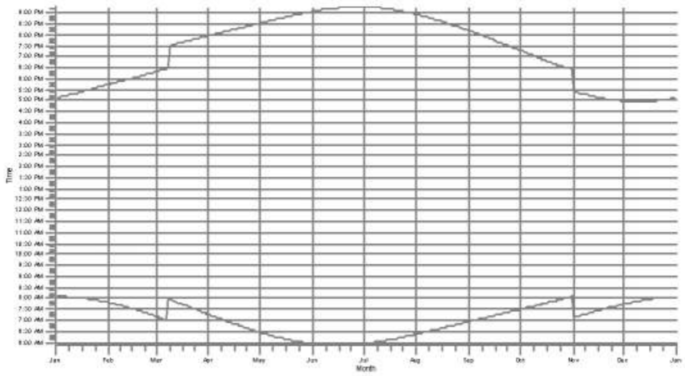
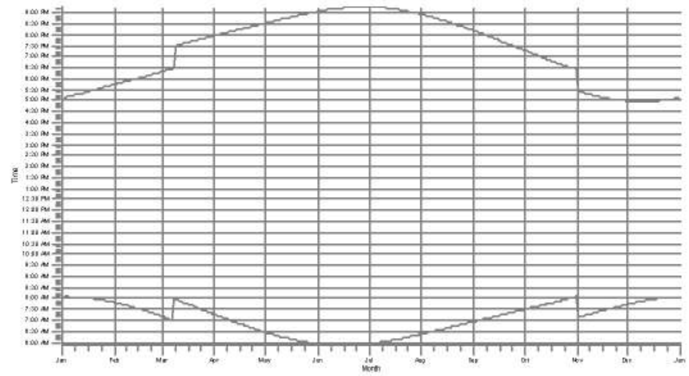
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

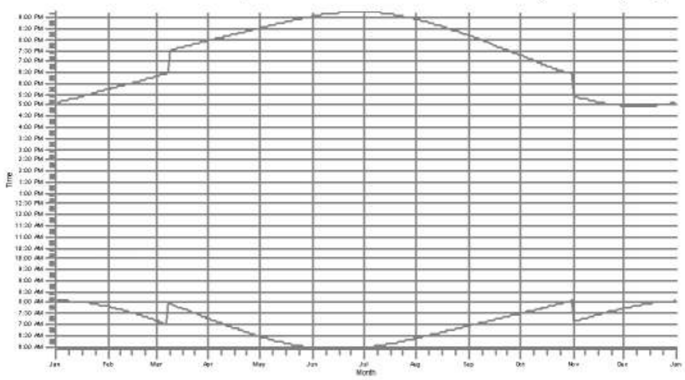
REC-121: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (121)



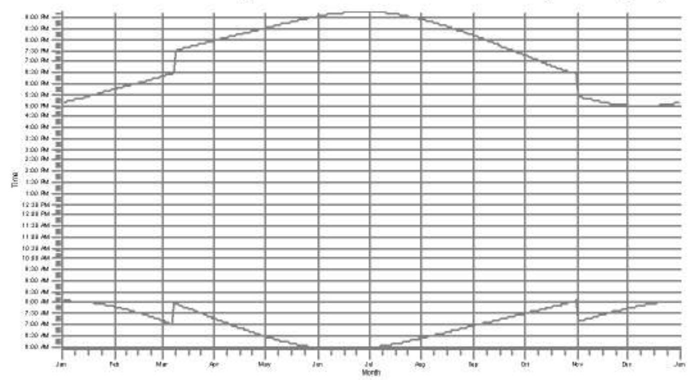
REC-122: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (122)



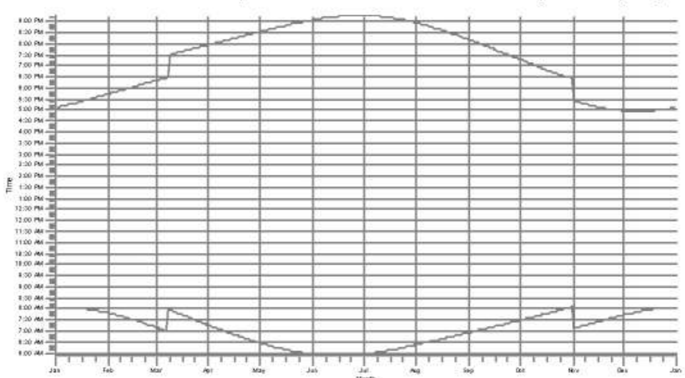
REC-123: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (123)



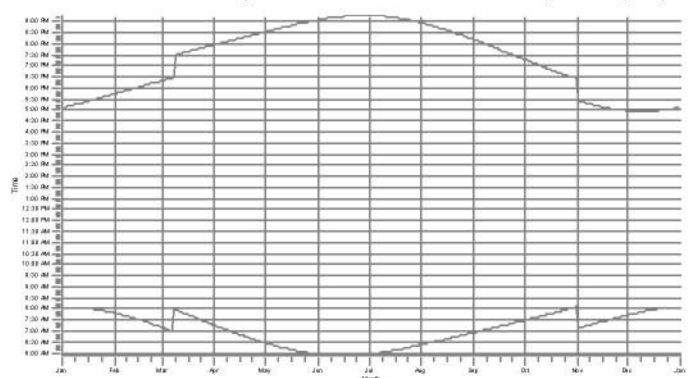
REC-124: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (124)



REC-125: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (125)



REC-126: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (126)

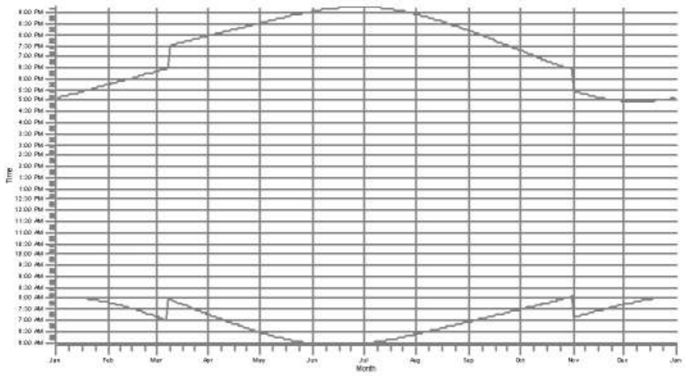


WTGs

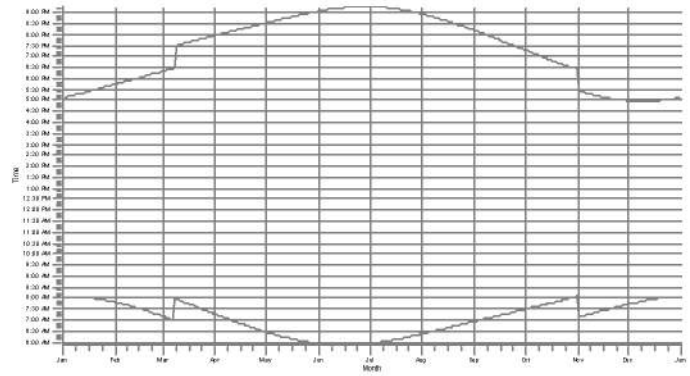
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

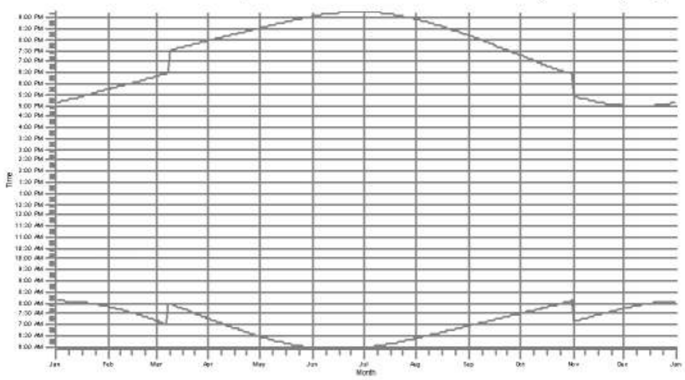
REC-127: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (127)



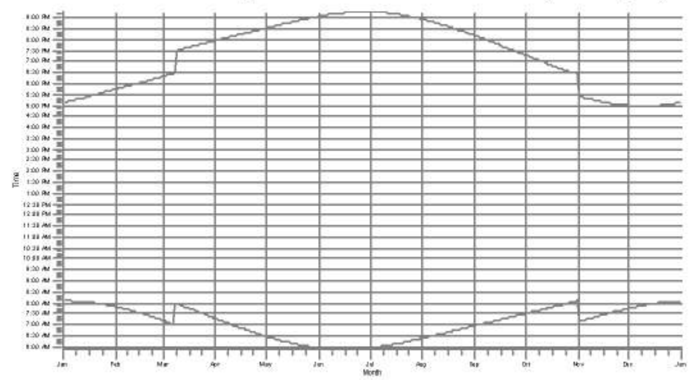
REC-128: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (128)



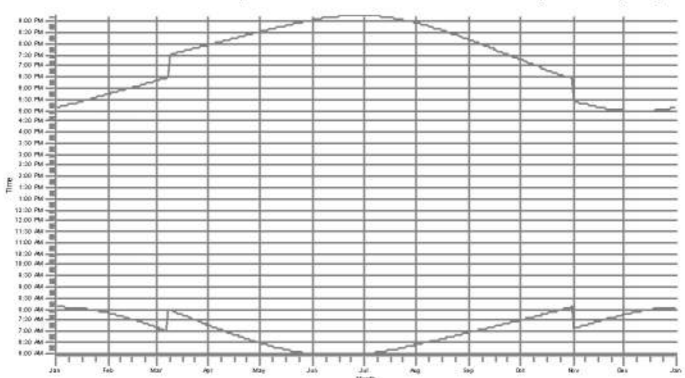
REC-129: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (129)



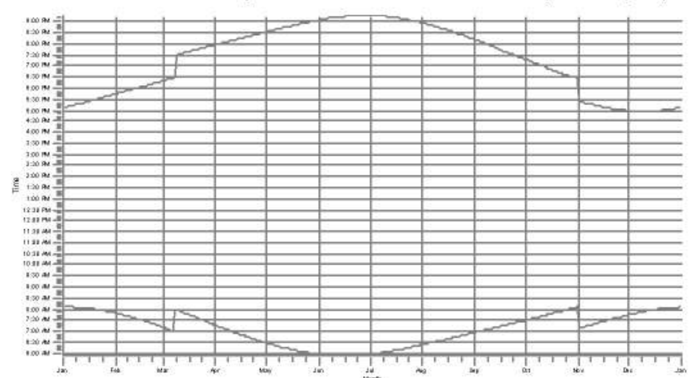
REC-130: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (130)



REC-131: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (131)



REC-132: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (132)

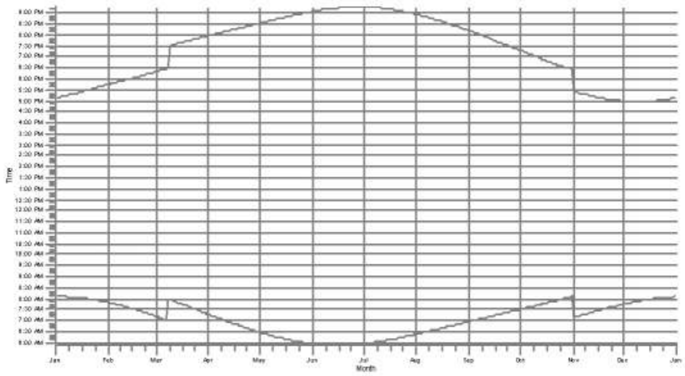


WTGs

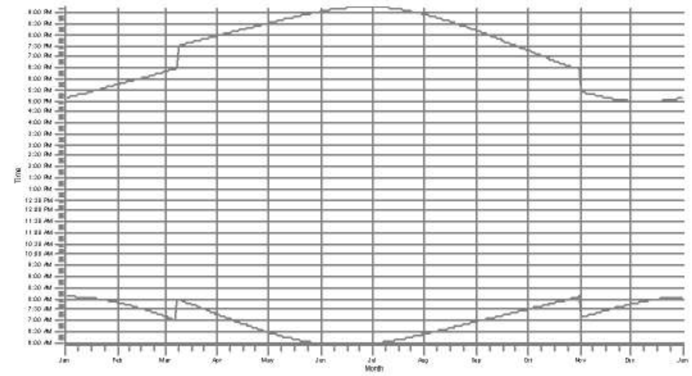
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

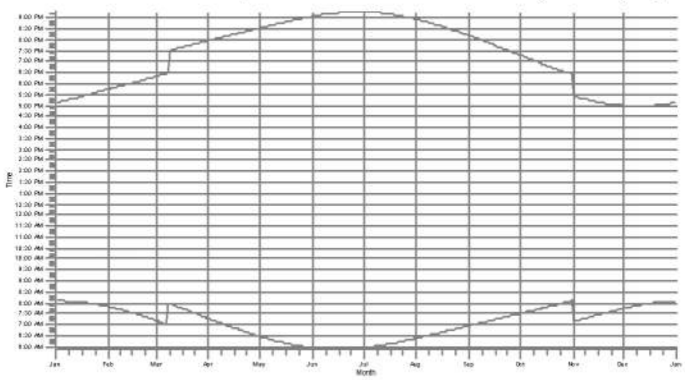
REC-133: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (133)



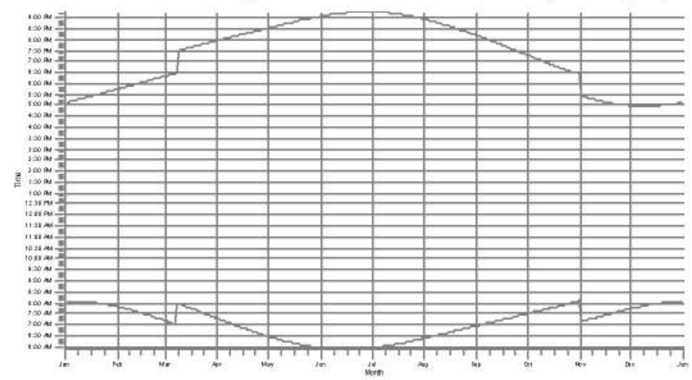
REC-134: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (134)



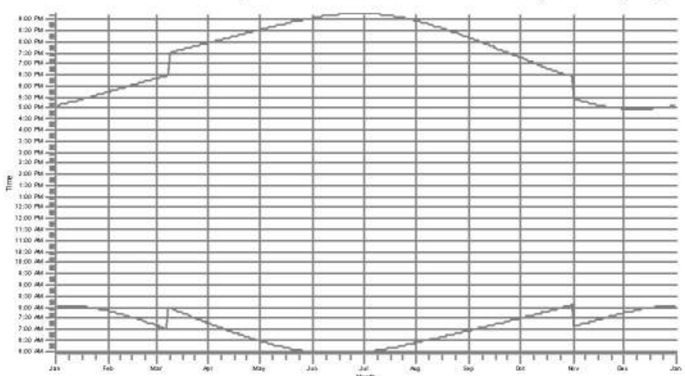
REC-135: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (135)



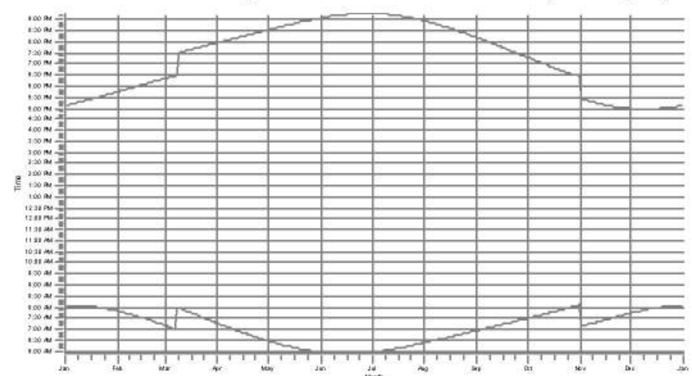
REC-136: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (136)



REC-137: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (137)



REC-138: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (138)



WTGs

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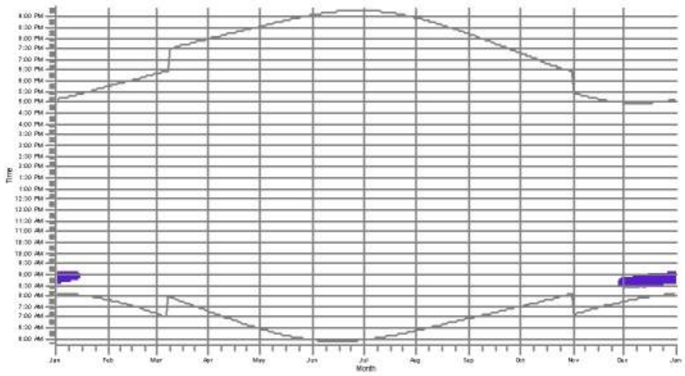
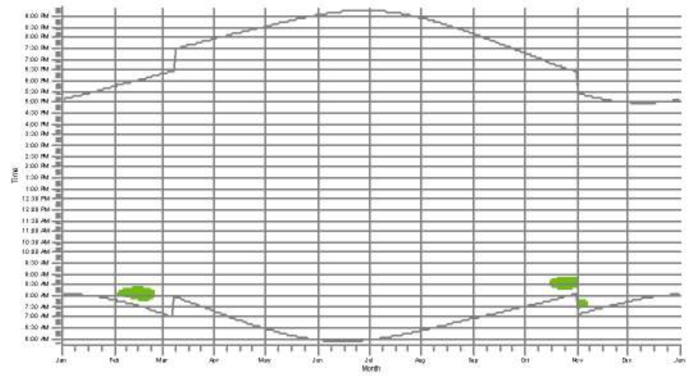
Calculation: Results.v6.62xGE3.8_wObstacles_noMap

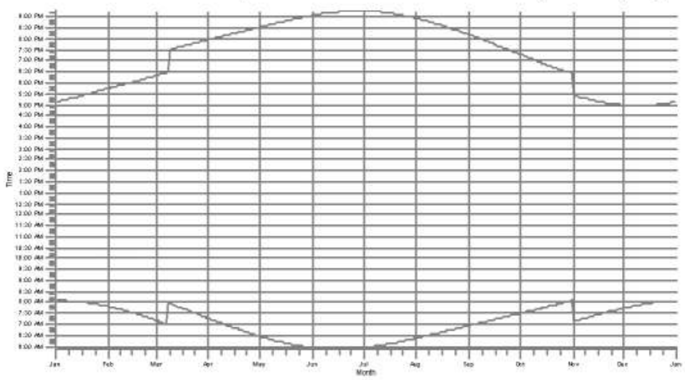
REC-139: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (139)



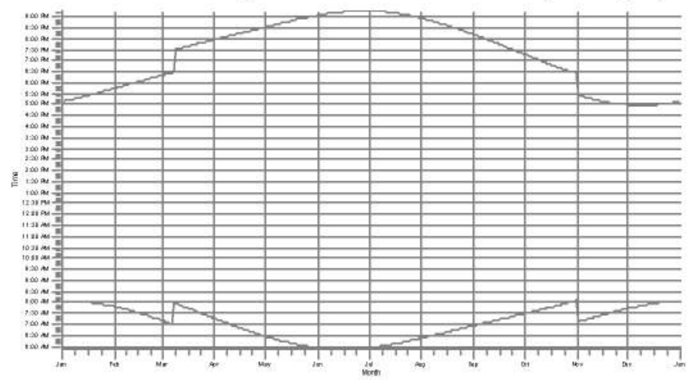
REC-140: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (140)



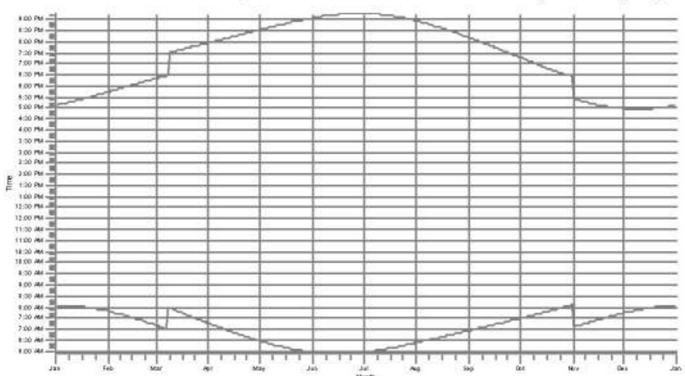
REC-141: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (141)



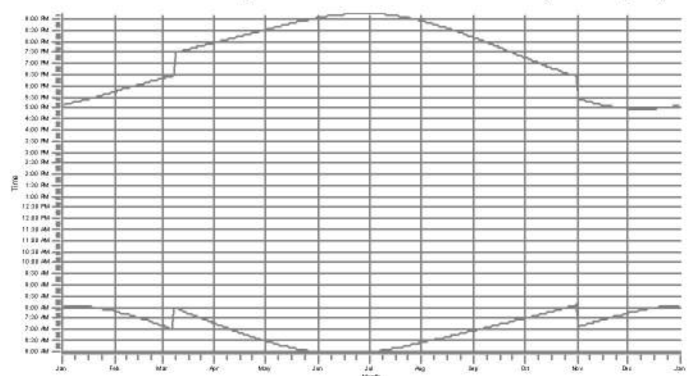
REC-142: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (142)



REC-143: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (143)



REC-144: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (144)



WTGs

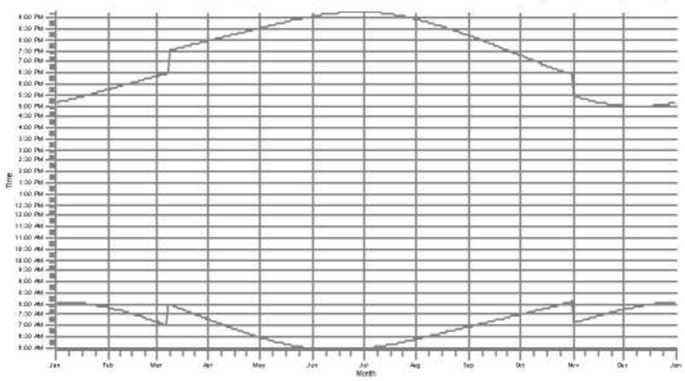
38.42: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (330)

48.52: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (340)

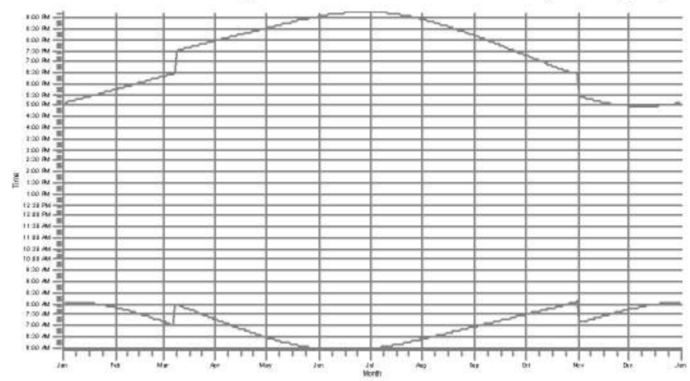
SHADOW - Calendar, graphical

Calculation: Results.v6.62xGE3.8_wObstacles_noMap

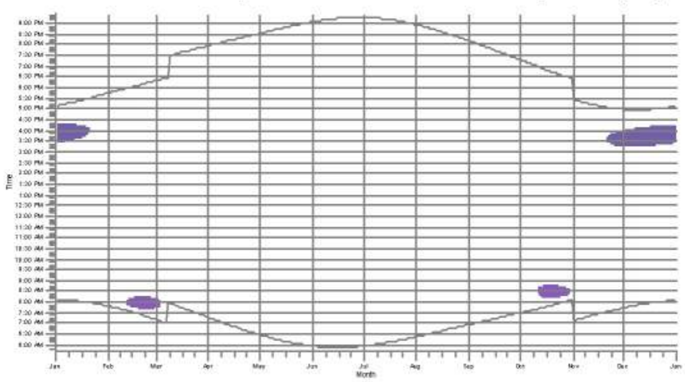
REC-145: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (145)



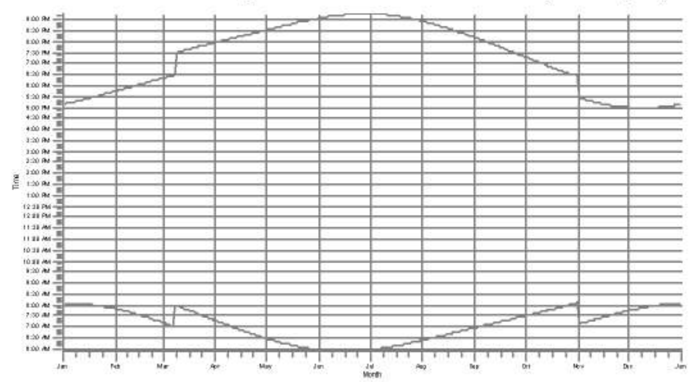
REC-146: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (146)



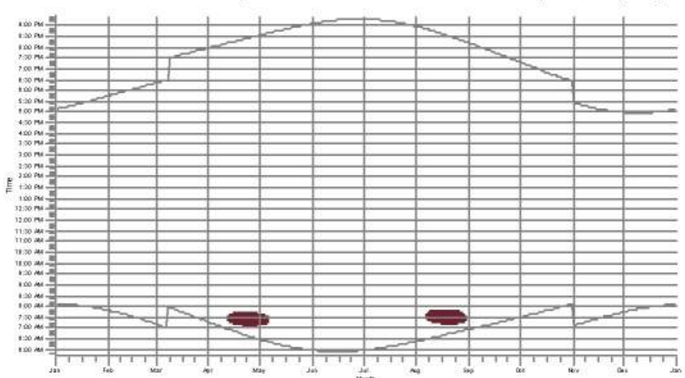
REC-147: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (147)



REC-148: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (148)



REC-149: Shadow Receptor: 1.0 × 1.0 Azimuth: 0.0° Slope: 0.0° (149)



WTGs

3A.32: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (320)
4A.44: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (332)
4A.45: GE WIND ENERGY GE 3.8-137 3830 137.0 !O! hub: 111.5 m (TOT: 180.0 m) (333)

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APPENDIX N - CULTURAL RESOURCES DOCUMENTATION

Available upon request.

APPENDIX O - PROJECT DISTURBANCE AREAS

Summary of Prevailing Wind Park Ground Disturbance Impacts

Project Component	Estimated Quantity	Construction Impacts (Temporary)		Operational Impacts (Long-Term)	
		Dimensions	Total Acreage	Dimensions	Total Acreage
Turbines	61 turbines	160-foot radius	113 acres	25-foot radius	3 acres
Access roads	17 miles	50-foot wide	103 acres	16-foot wide	33 acres
Upgraded roads	40 miles	N/A	3 acres	N/A	N/A
Crane paths	54 miles	60-foot wide	393 acres	N/A	N/A
Collector lines	65 miles	30-foot wide	236 acres	10-foot by 5-foot junction box	0.001 acre
Collection substation	1 substation	5 acres	5 acres	4 acres	4 acres
Meteorological towers	4 towers	200-foot by 200-foot area	4 acres	42-foot by 42-foot area	0.2 acre
O&M facility	1 facility	6 acres	6 acres	6 acres	6 acres
Laydown/staging/ batch plant areas	1 laydown area; batch plants located within the laydown area	12 acres	12 acres	N/A	N/A
Transmission line structures	381 structures	100-foot by 100-foot	87 acres	1.5-foot radius	0.06 acre
Step-up substation	1 substation	20 acres	20 acres	300-foot by 200-foot	1.4 acres
		Total[a]:	**982 acres**	**Total:**	**48 acres**

(a) Because there is some overlap in the disturbance areas for the individual Project components, the total impact acreages do not equal the sum of the impact acreages for the individual components presented in this table.

APPENDIX P - CONSISTENCY EVALUATION FORMS

Programmatic Biological Assessment Project Consistency Evaluation Form*
Upper Great Plains Region Wind Energy Development Program

(for USFWS Internal Use Only) *TAILS S7 Bundle #:* ______
Individual TAILS Log #: ______

Project Proponent

Project Name:	Prevailing Wind Park Project	Developer:	Prevailing Wind Park, LLC
State:	South Dakota	City:	San Fransisco,
County:	Bon Homme, Hutchinson, Charles Mix, Yankton	State:	CA
Township, Range & Sections:	see attached	POC:	Bridget Canty
		Phone:	831.430.6326

Federal Agency/Point of Contact

Fish & Wildlife Service Ecological Services Field Office		Western Area Power Administration	
City:	Pierre	City:	Billings
State:	South Dakota	State:	MT
POC:	Natalie Gates	POC:	Christina Gomer
Phone:	(605) 224-8693	Phone:	406.255.2811

For actions involving USFWS Land interests:

USFWS Wetland Management District: Lake Andes
City: Lake Andes State: SD
POC: Mike Bryant
Phone: 605-487-7603

	Y	N
USFWS Property Interest	☐	☒
Grassland Easement Exchange	☐	☒

Project Description Overview with Best Estimates

Construction Initiation Date:	4/1/19	Max. Turbine Ht:	590.6 (180 m)	Project Area Size:	50,858 ac
Construction Completion Date:	12/1/19	Turbine Pad Size:	201 sq ft (18.7 sq m)	Wind Reserve Area Size:	N/A
Number Turbines:	up to 61	Miles (km) of New Road:	15.2 mi (24.4 km)	Power Generating Initiation Date:	12/31/19
Turbine Tower Height (ft/m):	366 ft (111.5 m)	Miles (km) Improved Road:	36.9 mi (59.4 km)	Project Termination Date:	1/1/50
Turbine RSA:	3.6 ac (14,741 sq m)	Miles (km) Existing County Rd:	65 mi (104.6 km)		

Turbine Size (MW), Make & Model: 3.8 MW, GE 3.8-127

Collector Lines from Turbine to Substation: Miles Buried: 65 mi (104.6 km) Miles Overhead: 27.6 mi (44.4 km)(transmission line)

To help demonstrate compliance with the BMPs, Species Specific Avoidance and Minimization Measures, a complete application must include maps of the project area and associated species/habitat/buffer zones. Maps attached Yes ☒ No ☐

Land Cover Types Affected

	Yes	No	Private	State	Federal	Subtotal	% Total	Description/Comments
			Acres					
Native Grass	☒	☐	1,609			1,609	3	Native grasslands as defined by the South Dakota State Univ Native Lands GIS Layer
Tame Grass	☒	☐	2,036			2,036	4	non-native grasslands
Agricultural	☒	☐	42,934			42,934	84	croplands, hay fields, pastures
Wetland	☒	☐	1,403			1,403	3	wetlands and open water
Riparian	☐	☒	0			0	0	
Trees	☒	☐	376			376	1	evergreen forest
Other	☒	☐	2,500			2,500	5	developed, barren, scrub/shrub
Total			50,858 ac				100%	

ESA Listed (L), Proposed (P) and Candidate (C) Species Affected (Check Boxes)

Plants	Invertebrates	Fish	Reptiles	Birds	Mammals
☐ EP Fringed Orchid (L)	☐ American Burying Beetle (L)	☐ Bull Trout (L)	☐ Eastern Massasauga (C)	☐ G. Sage Grouse (C)	☐ Black-footed Ferret (L)
☐ Mead's Milkweed (L)	☐ Dakota Skipper (L)	☒ Pallid Sturgeon (L)		☒ Int. Least Tern (L)	☐ Canada Lynx (L)
☐ Prairie Bush Clover (L)	☒ Higgins Eye (L)	☐ Topeka Shiner (L)		☒ Piping Plover (L)	☐ Gray Wolf (L)
☐ Ute Ladies'-Tresses (L)	☐ Poweshiek Skipperling (L)			☒ Rufa Red Knot (L)	☐ Grizzly Bear (L)
☒ WP Fringed Orchid (L)	☐ Salt Creek Tiger Beetle (L)			☐ Sprague's Pipit (C)	☐ Indiana Bat (L)
☐ Whitebark Pine (C)	☒ Scaleshell Mussel (L)			☒ Whooping Crane (L)	☒ N. Long-Eared Bat (L)

[X] **Project proponent has reviewed the Programmatic Wind Energy EIS and BA, Appendix B of the BA relating to Species Consistency Evaluation Forms, and the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines.**

Commitment to incorporate applicable BMPs and Species-Specific Avoidance & Minimization Measures into the project plan:

Bridget Canty	B. C	March 12, 2019
Project Proponent (Point of Contact)	Signature	**Date**

Agency Verification of Compliance with the Programmatic Wind Energy Biological Assessment:

Matt Marsh	Matt Marsh	3/22/2019
Western Area Power Administration (Point of Contact)	Signature	**Date**
Scott Larson, ND/SD Field Supervisor	Scott Larson	3-28-19
U.S. Fish & Wildlife Service (Point of Contact)	**Signature**	**Date**
Natalie Gates	Natalie Gates	3-28-19
U.S. Fish & Wildlife Service (ES Field Office Lead Biologist)	Signature	**Date**

***Version 3: March 2015**

Township, Range, and Sections: T97N R62W S33-36; T97N R61W S25-27, 34-26; T96N R62W S1-4, 10-12, 13-15, 22-24, 25-27, 34-36; T96N 61W S1-3, 9-12, 13-18, 19-21, 28-30, 31-33; T95N R62W S1-3, 10-12, 13-15; T95N R 61W S1-18, 20-24; T95N R60W S6; Transmission line: follows boundary of T95/96N for R58- most of 60W; divides T95N R57W S5 and 9 in half N/S at POI; follows boundaries of T96N R60W S29/32, 30/31, T96N R61W S25/36, 26/35, 27/34 to wind farm footprint.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Western prairie fringed orchid (*Platanthera praeclara*)

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program,* will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

- [X] Minimize the size of areas in which soil would be disturbed or vegetation would be removed.
- [X] Initiate habitat restoration of disturbed soils and vegetation as soon as possible after construction activities are completed. Restore areas of disturbed soil using weed-free native grasses, forbs, and shrubs, in consultation with land managers and appropriate agencies such as State or county extension offices or weed boards.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries. Surveys should include proper identification and survey techniques based on recommendations from the USFWS on the most current survey protocols.

[X] Do not site turbines, access roads, transmission line towers, or other project facilities in occupied habitats.

[X] Clearly delineate buffer zones around locations of plants within the project area and restrict activities within 100 ft (30.5 m) of those locations.

Species-Specific Minimization Measures

For projects that encompass occupied habitat or that occur near occupied habitat:

[X] Employ additional project-specific BMPs to control invasive plants in areas of suitable habitat disturbed by project activities.

[X] Employ additional project-specific BMPs during and after construction to control erosion and runoff along access roads adjacent to suitable habitat.

[X] Avoid actions that could alter surface water flow, infiltration, and groundwater levels in suitable habitat.

[X] Do not use herbicides within 100 ft (30.5 m) of areas where the species occurs.

Impact Information

Project within county with recorded western prairie fringed orchid?	[X] Yes	[ ] No	
Preconstruction evaluations conducted with USFWS?	[X] Yes	[ ] No	Dates: 3/30/18
Parties involved:	Natalie Gates/USFWS, Bridget Canty/sPower		
Suitable habitat in or near project footprint?	[X] Yes	[ ] No	
Distance from suitable habitat:	0	Miles	
Has habitat been surveyed to protocol?	[ ] Yes	[X] No	Dates of survey:
Result of survey:	[ ] Occupied (species detected)		[ ] Not occupied (species not detected)
If occupied, 100 ft (30.5 m) buffer zones delineated?	[ ] Yes	[ ] No	
Map of project footprint and species habitat attached?	[X] Yes	[ ] No	

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect": The FWS identifies Hutchinson and Yankton Counties as counties of potential occurrence. The Project extends slightly into Hutchinson and Yankton counties; however, suitable habitat is limited to approximately 890 acres; suitable habitat within 100 ft of the Project is limited to 8.3 ac; temporary impacts are estimated to be 3.3 ac; and permanent impacts are estimated to be less than 0.0005 acre. The Project will avoid and minimize impacts to all wetland and grassland areas. Despite the very low likelihood of presence, direct mortality could occur if the species is present in the Project impact areas. However, all potential effects are not reasonably expected because they would be discountable or extremely unlikely to occur. Based on best judgement, a person would not expect discountable effects to occur because there is extremely limited potential habitat that would be permanently affected in the Project Area, there is a very low likelihood of use of the Project Area, and the species is likely extirpated from the Project Area. Therefore, the appropriate effects determination for western prairie fringed orchid at the Project is **may affect, not likely to adversely affect**.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Higgins eye (*Lampsilis higginsii*)

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program*, will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, one of the more important BMPs for the conservation of this species follows.

- [X] Initiate habitat restoration of disturbed soils and vegetation as soon as possible after construction activities are completed to minimize the possibility of erosion and runoff into Higgins eye occupied habitat.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries.

[X] Do not site turbines, access roads, transmission line towers, or other project facilities in aquatic habitat where Higgins eye mussels may be present.

Species-Specific Minimization Measures

The identified avoidance measures together with general BMPs to reduce ecological impacts from wind energy under the proposed program adequately address the conservation measures for this species.

Impact Information

Project within county with recorded Higgins eye?	[X] Yes	[ ] No	
Preconstruction evaluations conducted with USFWS?	[X] Yes	[ ] No	Dates: October 29, 2018
Parties involved: Reviewed IPaC list and habitat suitability			
Suitable habitat in or near project footprint?	[ ] Yes	[X] No	
Distance from suitable habitat:	13	Miles	
Has habitat been surveyed to protocol?	[ ] Yes	[X] No	Dates of survey:
Result of survey:	[ ] Occupied (species detected)		[ ] Not occupied (species not detected)
Map of project footprint and species habitat attached?	[X] Yes	[ ] No	

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":
Development would not occur in areas adjacent to the species' potential habitat. The Project is 13 miles from potential habitat and would not affect the Missouri River, so the Species-Specific Avoidance and Minimization Measures are not applicable and preconstruction surveys were not warranted. Therefore, the appropriate effects determination for Higgins Eye at the Project is **no effect**.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Scaleshell mussel (*Leptodea leptodon*)

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program*, will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

[X] None.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries.

[X] Do not site turbines, access roads, transmission line towers, or other project facilities in aquatic habitat where scaleshell mussels may be present.

Species-Specific Minimization Measures

The identified avoidance measures together with general BMPs to reduce ecological impacts from wind energy under the proposed program adequately address the conservation measures for this species.

Impact Information

Project within county with recorded scaleshell mussel?	[X] Yes [ ] No		
Preconstruction evaluations conducted with USFWS?	[X] Yes [ ] No	Dates:	October 29, 2018
Parties involved:	Reviewed IPaC list and habitat suitability		
Suitable habitat in or near project footprint?	[ ] Yes [X] No		
Distance from suitable habitat:	13 Miles		
Has habitat been surveyed to protocol?	[ ] Yes [X] No	Dates of survey:	
Result of survey:	[ ] Occupied (species detected)	[ ] Not occupied (species not detected)	
Map of project footprint and species habitat attached?	[X] Yes [ ] No		

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

Development would not occur in areas adjacent to potential species habitat. The Project is 13 miles from potential habitat and will not impact the Missouri River, so Species-Specific Avoidane and Minimization Measures are not applicable and preconstruction surveys were not warranted. Therefore, the appropriate effects determination for scaleshell mussel at the Project is **no effect**.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Pallid sturgeon (*Scaphirhynchus albus*)

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program*, will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

- [X] Dispose of excess excavation materials in approved areas to control erosion and minimize leaching of hazardous materials.
- [X] No refueling vehicles and equipment within 100 ft (30.5 m) of the ordinary high water mark or wetland boundary.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries.

[X] Do not site turbines, access roads, transmission line towers, or other project facilities in or immediately adjacent to aquatic habitat where pallid sturgeon occurs.

Species-Specific Minimization Measures

For projects that encompass areas within drainages occupied by pallid sturgeon:

[X] Employ BMPs (additional project-specific) during and after construction to control erosion and runoff to aquatic habitats.

[X] Avoid broadcast applications of pesticides or herbicides that may be harmful to the pallid sturgeon in aquatic habitat. Applications should be made by appropriately licensed applicators where required and applied only in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications. Limit pesticide use to non-persistent immobile pesticides.

[X] Employ measures to minimize the amount of stream habitat disturbance when transmission lines and access roads must be constructed across streams.

[X] Ensure that upstream and downstream fish passage is maintained in any areas where stream habitat disturbance occurs.

[X] Avoid actions that would alter surface water flow in occupied habitat.

Impact Information

Project within county with recorded pallid sturgeon? [X] Yes [ ] No

Preconstruction evaluations conducted with USFWS? [X] Yes [ ] No Dates: ________

Parties involved: ________

Suitable aquatic habitat in or near project footprint? [ ] Yes [X] No

Distance from suitable habitat: 13 Miles

Has habitat been surveyed to protocol? [ ] Yes [X] No Dates of survey: ________

Result of survey: [ ] Occupied (species detected) [ ] Not occupied (species not detected)

Project within drainages of occupied habitat? [X] Yes [ ] No

Species-specific minimization measures employed? [X] Yes [ ] No

Map of project footprint and species habitat attached? [X] Yes [ ] No

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Pallid sturgeon (*Scaphirhynchus albus*)

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

The Project will not impact the Missouri River. BMPs will be implemented to avoid and minimize any potential runoff into tributaries that are connected to the Missouri River. Therefore, the appropriate effects determination for pallid sturgeon at the Project is **no effect** .

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Interior least tern (*Sternula antillarum*)

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program*, will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

- [X] Meteorological towers shall not be located in sensitive habitats or in areas where resources known to be sensitive to human activities (e.g., wetlands, cultural resources, and listed species) are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors, and the disturbed area will be minimized.
- [X] The use of guy wires on meteorological towers shall be avoided or minimized. Any needed guy wires shall have guys appropriately marked with bird flight diverters.
- [X] Place approved marking devices on any newly constructed or upgraded transmission lines, where appropriate, within suitable habitats for sensitive bird species.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries.

[X] Do not site turbines, access roads, transmission lines, or other project facilities within the Missouri (including Niobrara River) and Yellowstone River system floodplains or any closer than 1.5 mi (2.4 km) from known/suitable sandbar habitat and reservoir shorelines with nesting, resting, and foraging areas.

[X] Do not site turbines, access roads, transmission lines, or other project facilities within the Platte River (including Loup and Elkhorn Rivers) system floodplain or any closer than 1.5 mi (2.4 km) from known/suitable riverine habitat.

[X] Do not site turbines, access roads, transmission lines, or other project facilities within 1.5 mi (2.4 km) of known sandpit nesting, resting, and foraging areas along the Platte River (including Loup and Elkhorn Rivers) system.

Species-Specific Minimization Measures

Additional minimization measures specifically intended to reduce the potential for adverse effects on the interior least tern have not been identified at this time. The identified avoidance measures together with general BMPs to reduce ecological impacts from wind energy under the proposed program adequately address the conservation measures for this species.

Impact Information

Project within county with recorded interior least tern?	[X] Yes	[ ] No	
Preconstruction evaluations conducted with USFWS?	[X] Yes	[ ] No	Dates: October 29, 2018
Parties involved: Reviewed IPaC and habitat suitability			
Suitable habitat in or near project footprint?	[ ] Yes	[X] No	
Distance from suitable Missouri River system habitat:	13	Miles	
Distance from suitable Platte River system riverine habitat	150	Miles	
Distance from suitable Platte River system sandpit habitat:	150	Miles	
Has habitat been surveyed to protocol?	[ ] Yes	[X] No	Dates of survey:
Result of survey:	[ ] Occupied (species detected)	[ ] Not occupied (species not detected)	
New overhead distribution/transmission lines proposed?	[X] Yes	[ ] No	
Distance from occupied habitat:	13	Miles	
Marking with bird flight diverters proposed?	[ ] Yes	[X] No	
Map of project footprint and species habitat attached?	[X] Yes	[ ] No	

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Interior least tern (*Sternula antillarum*)

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

There is no known habitat in the Project Area, so no loss of habitat would occur and Species-Specific Avoidance and Minimization Measures are not applicable. Desktop evaluation showed potential habitat and occupied areas 13 miles away, so preconstruction surveys were not warranted. Although the BMPs for marking devices would be applied where appropriate in the Project area, none are proposed specific to interior least tern because impact information indicates they are not warranted for this species. Direct mortality could occur from collision if the least tern were to migrate through the area during periods of low visibility. However, all potential effects are not reasonably expected because they would be discountable or extremely unlikely to occur. Based on best judgement, a person would not expect discountable effects to occur because there is no suitable habitat in the Project Area, there is a low likelihood of use of the Project Area, and the species was not documented at the adjacent Beethoven wind project during fatality monitoring surveys. Therefore, the appropriate effects determination for interior least tern at the Project is **may affect, not likely to adversely affect**.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Piping plover *(Charadrius melodus)*

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program*, will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

- [X] Meteorological towers shall not be located in sensitive habitats or in areas where resources known to be sensitive to human activities (e.g., wetlands, cultural resources, and listed species) are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors, and the disturbed area will be minimized.
- [X] The use of guy wires on meteorological towers shall be avoided or minimized. Any needed guy wires shall have guys appropriately marked with approved bird flight diverters.
- [X] Place marking devices on any newly constructed or upgraded transmission lines, where appropriate, within suitable habitats for sensitive bird species.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries.

[X] Do not site turbines, access roads, transmission lines, or other project facilities within the Missouri (including Niobrara River) and Yellowstone River system floodplains or any closer than 1.5 mi (2.4 km) from known/suitable sandbar habitat and reservoir shorelines with nesting, resting, and foraging areas.

[X] Do not site turbines, access roads, transmission lines, or other project facilities within the Platte River (including Loup and Elkhorn Rivers) system floodplain or any closer than 1.5 mi (2.4 km) from known/suitable riverine habitat.

[X] Do not site turbines, access roads, transmission lines, or other project facilities within 1.5 mi (2.4 km) of known sandpit nesting, resting, and foraging areas along the Platte River (including Loup and Elkhorn Rivers) system.

[X] Do not site turbines, transmission lines, access roads, or other project facilities within 3.0 mi (4.8 km) of alkali lakes where piping plover nesting has been documented or those designated as critical habitat.

[X] Do not site turbines, transmission lines, access roads, or other project facilities in between any alkali lakes identified with a 3.0 mi (4.8 km) buffer where the outer limit of the buffer zones are less than 3.0 mi (4.8 km) apart.

[X] Do not site turbines, transmission lines, access roads, or other project facilities within 1.5 mi (2.4 km) of riverine designated critical habitat or 3.0 mi (4.8 km) of alkali wetlands designated as critical habitat.

Species-Specific Minimization Measures

Additional minimization measures specifically intended to reduce the potential for adverse effects on the piping plover have not been identified at this time. The identified avoidance measures together with general BMPs to reduce ecological impacts from wind energy under the proposed program adequately address the conservation measures for this species.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Piping plover *(Charadrius melodus)*

Impact Information			
Project within county with recorded piping plovers?	[X] Yes	[ ] No	
Preconstruction evaluations conducted with USFWS?	[X] Yes	[ ] No	Dates: October 29, 2018
Parties involved:	Reviewed IPaC list and habitat suitability		
Suitable habitat in or near project footprint?	[ ] Yes	[X] No	
Distance from suitable riverine, reservoir, or alkali lake habitat:	13	Miles	
Distance from designated critical habitat:	13	Miles	
Has habitat been surveyed to protocol?	[ ] Yes	[X] No	Dates of survey:
Result of survey:	[ ] Occupied (species detected)		[ ] Not occupied (species not detected)
New overhead distribution/transmission lines proposed?	[X] Yes	[ ] No	
Distance from occupied piping plover habitat:	13	Miles	
Marking with bird flight diverters proposed?	[ ] Yes	[X] No	
Map of project footprint and species habitat attached?	[X] Yes	[ ] No	

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

There is no known habitat in the Project Area, so no loss of habitat would occur and Species-Specific Avoidance and Minimization Measures are not application. Desktop evaluation showed the closest potential riverine habitat 13 miles from the Project; the nearest documented alkali lakes are located in Knox County, Nebraska and Edmunds and Brown counties, South Dakota (125 mi, 145 mi, and 150 mi, respectively from the Project). In addition, no alkaline wetlands were identified during the wetland delineations conducted for the Project. Therefore, preconstruction surveys were not warranted. The Project is 13 miles from designated Critical Habitat. Although the BMPs for marking devices would be applied where appropriate in the Project area, none are proposed specific to piping plover because impact information indicates they are not warranted for this species. Direct mortality could occur from collision if piping plovers are present in the Project Area during periods of low visibility. However, all potential effects are not reasonably expected because they would be discountable or extremely unlikely to occur. Based on best judgement, a person would not expect discountable effects to occur because there is no suitable habitat in the Project Area, there is a low likelihood of use of the Project Area, and the species was not documented at the adjacent Beethoven wind project during fatality monitoring surveys. Therefore, the appropriate effects determination for piping plover at the Project is **may affect, not likely to adversely affect**.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Rufa red knot *(Calidris canutus rufa)*

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program,* will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

- [X] The use of guy wires on meteorological towers shall be avoided or minimized. Any needed guy wires shall have guys appropriately marked with approved bird flight diverters.
- [X] Place marking devices on any newly constructed or upgraded transmission lines, where appropriate, within suitable habitats for sensitive bird species.

Species-Specific Avoidance Measures

[X] Conduct preconstruction evaluations and/or surveys in areas of potential occurrence to identify suitable habitat and areas of occurrence within project boundaries.

Species-Specific Minimization Measures

Additional minimization measures specifically intended to reduce the potential for adverse effects on the rufa red knot have not been identified at this time. The identified general BMPs to reduce ecological impacts from wind energy under the proposed program adequately address the conservation measures for this species. Additional minimization measures specifically intended to reduce the potential for adverse effects on the rufa red knot have not been identified at this time. The identified general BMPs to reduce ecological impacts from wind energy under the proposed program adequately address the conservation measures for this species.

Coordinate with the local USFWS field office regarding new species information or conservation measures during planning stages.

Impact Information

Project within county with recorded rufa red knot as a transient?	[X] Yes	[ ] No	
Preconstruction evaluations conducted with USFWS?	[X] Yes	[ ] No	Dates: 12/13/17
Parties involved: Natalie Gates/USFWS, Lesley Murphy/SDGFP, Bridget Canty/sPower, Korina Cassidy/sPower, Clayton Derby/WEST, Kristin Nasman/WEST			
Suitable stopover habitat in or near project footprint?	[ ] Yes	[X] No	
Distance from suitable habitat:	13	Miles	
New overhead distribution/transmission lines proposed?	[X] Yes	[ ] No	
Distance from suitable stopover habitat?	13	Miles	
Marking with approved bird flight diverters proposed?	[ ] Yes	[X] No	
Map of project footprint and species habitat attached?	[X] Yes	[ ] No	

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

There is no known habitat in the Project Area, so no loss of habitat would occur and Species-Specific Avoidance and Minimization Measures are not applicable. Desktop evaluation showed potential habitat and occupied areas 13 miles away, so preconstruction surveys were not warranted. Although the BMPs for marking devices would be applied where appropriate in the Project area, none are proposed specific to Rufa red knot because impact information indicates they are not warranted for this species. Direct mortality could occur from collision if the Rufa red knot were to migrate through the area during periods of low visibility. However, all potential effects are not reasonably expected because they would be discountable or extremely unlikely to occur. Based on best judgement, a person would not expect discountable effects to occur because there is no suitable habitat in the Project Area, there is a low likelihood of use of the Project Area, and the species was not documented at the adjacent Beethoven wind project during fatality monitoring surveys. Therefore, the appropriate effects determination for Rufa red knot at the Project is **may affect, not likely to adversely affect**.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Whooping crane *(Grus americana)*

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program,* will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

- [X] The use of guy wires on meteorological towers shall be avoided or minimized. Any needed guy wires shall have guys appropriately marked with approved bird flight diverters.

Species-Specific Avoidance Measures

For projects that occur within the portion of the whooping crane migration corridor that encompasses 95 percent of historic sightings:

[X] Conduct preconstruction evaluations and/or surveys to identify wetlands that provide potentially suitable stopover habitat and areas of occurrence within project boundaries.

[ ] Do not site turbines, transmission lines, access roads, or other project facilities within 1 mi (1.6 km) of wetlands that provide suitable stopover habitat or within 5 mi (8 km) of the Platte or Niobrara Rivers in Nebraska.

[X] Do not site turbines, transmission lines, access roads, or other project facilities within 5 mi (8 km) of designated critical habitat.

Species-Specific Minimization Measures

For projects that that occur within the portion of the whooping crane migration corridor that encompasses 95 percent of historic sightings:

[X] Place approved bird flight diverters on the top static wire on any new or upgraded overhead collector, distribution, and transmission lines within 1 mi (1.6 km) of suitable stopover habitat.

[X] Establish a procedure for preventing whooping crane collisions with turbines during operations by establishing and implementing formal plans for monitoring the project site and surrounding area for whooping cranes during spring and fall migration periods throughout the operational life of the project (or as determined by the local USFWS field office) and shutting down turbines and/or construction activities within 2 mi (3.2 km) of whooping crane sightings. Monitoring can be done by existing onsite personnel trained in whooping crane identification. Specific requirements of the monitoring and shutdown plan will be determined during preconstruction evaluations. Sightings of whooping cranes in the vicinity of projects will be reported to the appropriate USFWS field office immediately.

[X] Instruct workers in the identification and reporting of sandhill and whooping cranes and to avoid disturbance of cranes present near project areas.

[ ] The acreage of wetlands that are potentially suitable migratory stopover habitat located within a 0.5 mi (0.8 km) radius of turbines may be mitigated based upon site-specific evaluations.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Whooping crane *(Grus americana)*

Impact Information				
Project within county with recorded whooping crane?	[X] Yes	[ ] No		
Preconstruction evaluations conducted with USFWS?	[X] Yes	[ ] No	Dates:	12/13/17
Parties involved:	Natalie Gates/USFWS, Lesley Murphy/SDGFP, Bridget Canty/sPower, Korina Cassidy/sPower, Clayton Derby/WEST, Kristin Nasman/WEST			
Suitable habitat in or near project footprint?	[X] Yes	[ ] No		
Distance from suitable stopover habitat:	0*	Miles *(predicted)		
Distance from designated critical habitat?	150	Miles		
Distance from the Platte or Niobrara River?	25	Miles		
New overhead distribution/transmission lines proposed?	[X] Yes	[ ] No		
Distance from suitable stopover habitat?	0	Miles		
Marking with approved bird flight diverters proposed?	[X] Yes	[ ] No		
Monitoring plan for spring/fall migration (copy attached)?	[X] Yes	[ ] No		
Employees trained in identification of whooping cranes?	[X] Yes	[ ] No		
Shut-down protocol for sitings within 2 mi (3.2 km) (attached)?	[X] Yes	[ ] No		
Map of project footprint and species habitat attached?	[X] Yes	[ ] No		

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect":

Project is outside of the 95% national migration corridor used and described in the PEIS. Project not near designated critical habitat, but potential stopover habitat does exist within Project footprint and vicinity. Project will train employees to identify whooping cranes and implement shutdown of turbines if whooping cranes within 2 miles of turbines. Mortality may occur from collision with turbine blades (though no whooping cranes have been reported as fatalities at operating projects) or overhead powerline; suitable habitat may be avoided or degraded. However, all potential effects are not reasonably expected because they would be discountable or extremely unlikely to occur. Based on best judgement, a person would not expect discountable effects to occur because the Project Area is outside the national migration corridor; the species has not been observed in the Project Area; the species was not observed at the adjacent Beethoven wind project during preconstruction or fatality monitoring surveys; and the Project will implement minimization measures, including installation of flight diverters on approximately 1.7 miles of transmission line that overlap with predicted high quality habitat for the species, voluntary implementation of a migration observation plan during Project operations, and avoidance of impacts to suitable stopover habitat. Therefore, the appropriate effects determination for whooping crane at the Project is **may affect, not likely to adversely affect.**

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Northern long-eared bat *(Myotis septentrionalis)*

Project Name: Prevailing Wind Park Project

Company: Prevailing Wind Park, LLC

Best Management Practices

[X] All general BMPs, as stated in the final *Programmatic Environmental Impact Statement for the Upper Great Plains Region Wind Energy Program* and table 4.5-1 of the final *Programmatic Biological Assessment for the Upper Great Plains Region Wind Energy Program*, will be implemented where appropriate, during each phase of the project (i.e., site characterization, construction, operations, and decommissioning). Although not all-inclusive, several of the more important BMPs for the conservation of this species follow.

[X] Activities with continuous periods (i.e., longer than 24 hours) of noise disturbances greater than 75 db measured on the A scale (e.g., loud machinery) should be avoided within a 1-mi (1.6-km) radius of known or assumed northern long-eared bat hibernacula..

[X] Restrict use of herbicides for vegetation management near known or assumed northern long-eared bat hibernacula to those specifically approved for use in karst (e.g., sinkholes) and water (e.g., streams, ponds, lakes, wetlands).

[X] Avoid clearing of suitable habitat (spring staging, fall swarming, summer roosting) within a 5-mile (8.0 km) radius of known or assumed northern long-eared bat hibernacula. Retain snags, dead/dying trees, and trees with exfoliating (loose) bark ≥3-in. (7.6-cm) diameter at breast height (dbh) in areas ≤1 mi (1.6 km) from water.

[X] Develop and implement a Bird and Bat Conservation Strategy (BBCS) as described in the *Land-Based Wind Energy Guidelines* that includes survey protocols acceptable to the USFWS in the project area during the spring and fall bird and bat migration seasons. Mortality monitoring will help to identify individual turbines that contribute to avian and bat mortality. This information could be used to provide design layout information for future wind development projects and to reduce the potential for future avian and bat mortality.

Species-Specific Avoidance Measures

[X] Throughout the range of the northern long-eared bat within the UGP Region, conduct preconstruction evaluations and/or surveys to identify suitable foraging, roosting, and commuting habitat within project boundaries and to identify the distance from project boundaries to hibernacula known/presumed used by northern long-eared bats. Disturbance of hibernacula is prohibited throughout the year.

[X] Avoid all suitable habitat (do not site turbines) in areas within 5 mi (8 km) of hibernacula used by northern long-eared bats or within 0.5 mi (0.8 km) of known or presumed occupied foraging, roosting, and commuting habitat. Habitat evaluations should be coordinated with the local USFWS Ecological Services Office prior to or during turbine site planning.

Species-Specific Minimization Measures

[X] A robust survey developed and implemented as part of the BBCS program, consistent with the Wind Energy Guidelines and approved by the USFWS during the preconstruction evaluation and survey stage, will be implemented for a minimum of 1 yr preconstruction.

[X] The need for implementation of cut-in speeds higher than manufacturers' recommendations during the fall bat migration period will be based on the following site-specific, project-by-project risk assessments by the State Ecological Services Field Office of the USFWS:

- During the preconstruction evaluation and survey stage, and based on a collision risk assessment of location of the project, proximity to potential summer habitat, distance to known occurrences, distance to known hibernacula, and suspected migration patterns, the applicant will coordinate with Western, Refuges, and the local Ecological Services Field Offices of the USFWS to determine if the risk of injury or mortality is sufficiently high to warrant higher cut-in speeds.
- In the event that preconstruction surveys indicate species occurrence or occupancy of habitat adjacent to the project area, higher turbine cut-in speeds will be required to offset the increased risk for injury or mortality. The monitoring must be rigorous enough to meet standards acceptable to the local USFWS State office.
- When warranted by either of the two aforementioned conditions for specific projects, turbine cut-in speeds will be increased to 16.4 ft/sec (5.0 m/sec) or greater from 0.5 hour before sunset to 0.5 hour after sunrise during the fall migration period (generally August 15–October 15, but consult with the USFWS for the established migration dates in each State) for northern long-eared bats in the western and central areas of the UGP Region. In the eastern fringe of the UGP Region, a minimum cut-in speed of 22.6 ft/sec (6.9 m/sec) from 0.5 hour before sunset to 0.5 hour after sunrise during the fall migration period (generally August 15–October 15, but consult with the USFWS for established migration dates in each State) for northern long-eared bats is required. Areas within the UGP Region that occur east of the western borders of Minnesota and Iowa will be used as the line of demarcation where the minimum cut-in speed of 22.6 ft/sec (6.9 m/sec) will be used. Use of feathering below the respective cut-in speed of 16.4 ft/sec (5.0 m/sec) or 22.6 ft/sec (6.9 m/sec) will also be implemented at night during the fall migration season to eliminate turbine rotation and avoid mortality of migrating northern long-eared bats. Increased cut-in speed and feathering can be suspended from 0.5 hour after sunrise to 0.5 hour before sunset.

[X] Immediately report observations of northern long-eared bat mortality to the appropriate USFWS office.

Programmatic Biological Assessment Species Consistency Evaluation Form
Upper Great Plains Region Wind Energy Development Program
Impact Information and Consistency Determination

Northern long-eared bat *(Myotis septentrionalis)*

Impact Information

Project within county with recorded northern long-eared bat? [X] Yes [ ] No

Preconstruction evaluations conducted with USFWS? [X] Yes [ ] No Dates: December 13, 2017

Parties involved: Natalie Gates/USFWS, Lesley Murphy/SDGFP, Bridget Canty/sPower, Korina Cassidy/sPower, Clayton Derby/WEST, Kristin Nasman/WEST

Suitable foraging or roosting habitat in or near project footprint? [X] Yes [ ] No

Distance from suitable habitat: 0.3 Miles

Distance from hibernacula: 250 Miles

Has habitat been surveyed to protocol? [X] Yes [ ] No Dates of survey: Jul-Aug 2015; Jul-Aug 2016

Result of survey: [X] Occupied (species detected) [ ] Not occupied (species not detected)

Turbine cut-in speed: 3.0 m/sec (5.0 m/sec curtailed)

Map of project footprint and species habitat attached? [X] Yes [ ] No

Effects—Explanation of consistency determination with programmatic effects determination of "may affect, not likely to adversely affect" or "no effect": Presence/absence surveys were conducted for the NLEB over the course of two years, 2015 and 2016. During the 2015 surveys and within the original Project Area, NLEB were detected at two of the 20 survey stations. One station south of Avon and 4 miles from the current boundary had five documented calls and one station on the western edge had a single call. The Project boundary was moved north and away from the the Missouri River. The 2016 survey area covered most of the current Project Area excluding the extreme northwest and northeast corners. No calls were detected from the eight survey stations in 2016, including the location of the one confirmed call south of the Project boundary from 2015, indicating probable absence in the Project Area. The lack of detections in 2016 seems to coincide with the westward spread of white-nose syndrome. The species may pass through the Project Area during migration and could experience direct mortality if they are present when turbines are operating. However, all potential effects are not reasonably expected because they would be discountable or extremely unlikely to occur. Based on best judgement, a person would not expect discountable effects to occur because there have been no recent detections of the species in the Project Area; there is very limited suitable habitat for the species in the Project Area; the species was not detected during fatality monitoring at the adjacent Beethoven wind project; and the Project will implement minimization measures to reduce potential impacts during fall migration, including increasing turbine cut-in speeds to 5.0 meters/second and feathering turbine blades below 5.0 meter/second at turbines 24 and 63 (located 0.2 mi and 0.3 mi from NLEB detections, respectively) during fall migration (15 August - 15 October). Therefore, the appropriate effects determination for NLEB at the Project is **may affect, not likely to adversely affect.**

APPENDIX Q - SCOPING MEETING INFORMATION

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

B0401.BL

NOV 2 0 2017

Dear Customers and Interested Parties:

This letter is to notify you of the proposed Prevailing Wind Park wind energy facility (Project) and to request your input on the proposed Project. Prevailing Winds, LLC proposes to produce up to 200 megawatts (MWs) of generating capacity from up to 100 wind turbines and associated facilities. In addition to the wind turbines, Project components would include an underground power collection system, a new Project substation, an overhead power line, access roads, and a maintenance and operation center. The Project area under consideration is approximately 47,000 acres of private land in Bon Homme, Charles Mix, and Hutchinson Counties between the towns of Avon, Tripp, and Wagner, South Dakota (see enclosed map).

The Project would interconnect with Western Area Power Administration's (WAPA) Utica Junction Substation, located approximately 22 miles east of the Project. As a result, WAPA will provide federal oversight of the preparation of an Environmental Assessment (EA) under the National Environmental Policy Act. The EA will evaluate the environmental effects of the proposed Project on resources such as wetlands, vegetation and wildlife, cultural and recreation resources, as well as other social, economic, and environmental effects.

WAPA is announcing a public scoping period for the Project. The scoping period provides an opportunity for the general public, government agencies, tribal governments, and others to identify issues and alternatives that will help WAPA define the scope of the EA. One public scoping meeting (open house format) will be held to provide an opportunity for interested parties to discuss the Project with resource specialists and to submit comments. The meeting will be held on Wednesday, December 13, 2017, from 5:00 p.m. to 8:00 p.m., at the Tripp Legion Hall, 102 N. Main Street, Tripp, SD, 57376.

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North
  Billings, MT 59101
- By fax to (406) 255-2900
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting:
  December 13, 2017
  5:00 p.m. – 8:00 p.m.
  Tripp Legion Hall
  102 N Main Street
  Tripp, SD 57376

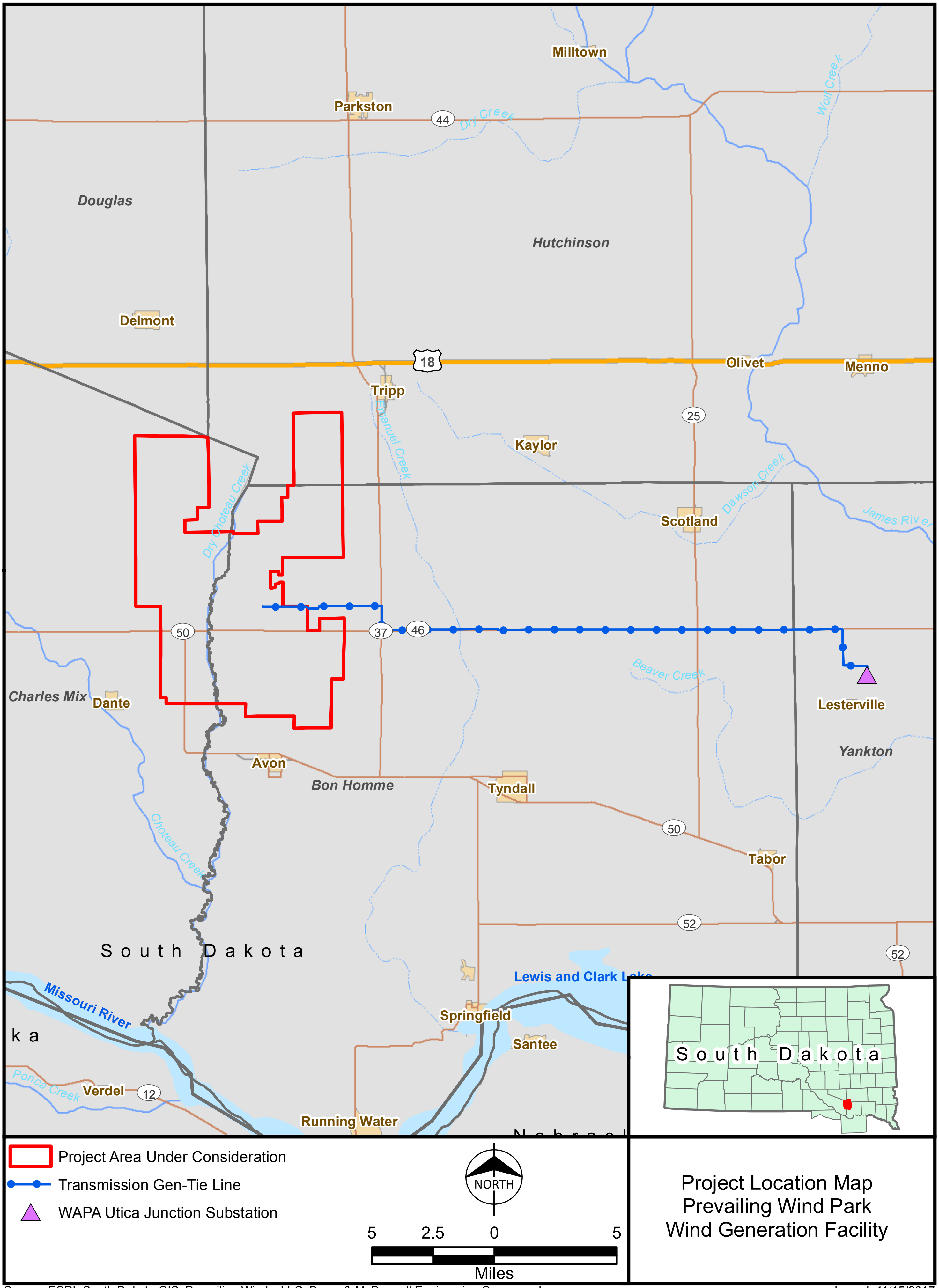
For your input to be considered during preparation of the draft EA, WAPA requests comments by January 13, 2018. If you have any questions, or need more information about the Project, please contact WAPA using the methods listed above. Thank you for your time and interest in the project.

Sincerely,

Christina Gomer

Christina Gomer
NEPA Coordinator

Enclosure



Project Location Map
Prevailing Wind Park
Wind Generation Facility

Path: Z:\Clients\ENS\PrevailingWi\91343_Permitting\Studies\Geospatial\DataFiles\ArcDocs\ProjectLocation_20171115.mxd jbell 11/15/2017

Source: ESRI; South Dakota GIS; Prevailing Winds, LLC; Burns & McDonnell Engineering Company, Inc.

Issued: 11/15/2017

Affidavit of Publication

State of South Dakota
County of Bon Homme } ss

Rebecca Uy Being first duly sworn says that The **Scotland Journal** is a legal weekly newspaper for the publication of legal and other official notices as required by the South Dakota Revised Code of Nineteen Hundred Nineteen, and any amendments thereof, printed and published in the City of Scotland, County of Bon Homme, and State of South Dakota, and has been such a legal newspaper during the time hereinafter mentioned, with a bona fide circulation of at least 250 copies weekly, and published within said county for more than 52 successive weeks prior to the first time herein mentioned and is printed in the English language in whole or in part in an office maintained at the place of publication and that deponent is the publisher in charge of the advertising department of said newspaper; that the advertisement headed

SDNA 2x5 WAPA

a printed copy of which hereto attached, was printed and published in said newspaper for .... successive weeks, upon the following dates:

Nov. 29 2017	.... 20.....
Dec. 6 2017	.... 20.....
Dec. 13 2017	.... 20.....
.... 20.....	.... 20.....

That the full amount of the fee charged for the publication of said notice, $142.20 inures to the benefit of the publisher of said newspaper, that no agreement or understanding for the division thereof has been made with any other person, and that no part has been agreed to be paid to any person whomsoever.

Rebecca Uy, publisher

Subscribed and sworn to before me this 13 day of December, 2017

Peggy Schelske
Notary Public, South Dakota

My commission expires 10-24-2021

PEGGY SCHELSKE Notary Public SEAL South Dakota

PUBLIC INPUT ENCOURAGED!

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility located in Bon Homme, Charles Mix, and Hutchinson Counties between the towns of Avon, Tripp, and Wagner, South Dakota. The proposed project, to be called Prevailing Wind Park, would include up to 100 wind turbine generators, an underground power collection system, project substation, access roads, and a maintenance and operation center. The project would also include an overhead gen-tie line from the project substation to Western Area Power Administration's (WAPA) Utica Junction Substation within Bon Homme and Yankton Counties. Construction of the Prevailing Wind Park is proposed to begin as early as mid-2018.

Western Area Power Administration will hold one public scoping meeting (open house format) to provide an opportunity for interested parties to discuss the project with the project developer (Prevailing Winds, LLC) and resource specialists and to submit comments. The meeting will be held on Wednesday, December 13, 2017, from 5:00 p.m. to 8:00 p.m., at the Tripp Legion Hall.

To learn more about this project and to share your ideas, join us at:

December 13, 2017 • 5:00 p.m. – 8:00 p.m.
Tripp Legion Hall • 102 N Main Street
Tripp, SD 57376

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration, Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By fax to (406) 255-2900
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 13, 2018.

Affidavit of Publication

State of South Dakota }
County of Bon Homme } SS

Rebecca Tiyz..........Being first duly sworn says that the **Tyndall Tribune & Register** is a legal weekly newspaper for publication of legal and other official notices as required by Chapter 298 of the Session Laws of South Dakota, 1939; that it has bona fide paid circulation of more than two hundred copies weekly; that it is published in English language in the City of Tyndall, Bon Homme County, South Dakota, and has been admitted to the United States mail under second class mailing privilege for more than one year prior to the first publication of the notice herein mentioned, and that it is printed in an office maintained at the place of publication at Tyndall, South Dakota, and that deponent is the publisher in charge of the advertising department of said newspaper; that the advertisement headed

SDNA 2x5 WAPA

a printed copy of which is hereto attached, was printed and published in said newspaper for three successive weeks, upon the following dates:

Nov. 29 20 17	........................20......
Dec 6 20 17	........................20......
Dec 13 20 17	........................20......
........................20......	........................20......

That the full amount of the fee charged for the publication of said notice, $ 144.60, inures to the benefit of the publisher of said newspaper, that no agreement or understanding for the division thereof has been made with any other person, and that no part has been agreed to be paid to any person whomsoever.

Rebecca Tiyz, publisher

Subscribed and sworn to before me this 13 day of December 20 17

Peggy Scheleske
Notary Public, South Dakota
My Commission expires Oct. 24, 2021

PEGGY SCHELSKE
Notary Public
SEAL
South Dakota

PUBLIC INPUT ENCOURAGED!

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility located in Bon Homme, Charles Mix, and Hutchinson Counties between the towns of Avon, Tripp, and Wagner, South Dakota. The proposed project, to be called Prevailing Wind Park, would include up to 100 wind turbine generators, an underground power collection system, project substation, access roads, and a maintenance and operation center. The project would also include an overhead gen-tie line from the project substation to Western Area Power Administration's (WAPA) Utica Junction Substation within Bon Homme and Yankton Counties. Construction of the Prevailing Wind Park is proposed to begin as early as mid-2018.

Western Area Power Administration will hold one public scoping meeting (open house format) to provide an opportunity for interested parties to discuss the project with the project developer (Prevailing Winds, LLC) and resource specialists and to submit comments. The meeting will be held on Wednesday, December 13, 2017, from 5:00 p.m. to 8:00 p.m., at the Tripp Legion Hall.

To learn more about this project and to share your ideas, join us at:

December 13, 2017 • 5:00 p.m. – 8:00 p.m.
Tripp Legion Hall • 102 N Main Street
Tripp, SD 57376

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration, Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By fax to (406) 255-2900
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 13, 2018.

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA
COUNTY OF HUTCHINSON

SCOTT E. EHLER, BEING DULY SHORN, SAYS: THAT THE TRIPP STAR LEDGER IS, AND DURING ALL THE TIME HEREINAFTER MENTIONED WAS, A WEEKLY LEGAL NEWSPAPER AS DEFINED IN SDCL 17-2-2, AS AMENDED, PUBLISHED AT PARKSTON, HUTCHINSON COUNTY, SOUTH DAKOTA BY THE PARKSTON ADVANCE, INC.; THAT AFFIANT IS AND DURING ALL OF SAID TIMES WAS, AN EMPLOYEE OF THE PUBLISHER OF SUCH NEWSPAPER AND HAS PERSONAL KNOWLEDGE OF THE FACTS STATED IN THIS AFFIDAVIT; THAT THE NOTICE, ORDER OR ADVERTISEMENT, A PRINTED COPY OF WHICH IS ATTACHED, WAS PUBLISHED IN SAID NEWSPAPER FOR 3 SUCCESSIVE ISSUES, BEARING THE FOLLOWING DATES:

NOVEMBER 29, 2017
DECEMBER 6, 2017
DECEMBER 13, 2017

THAT THE FULL AMOUNT OF THE FEE CHARGED FOR PUBLISHING THE SAME TO WIT, THE SUM OF $150.00, INURES SOLELY TO THE BENEFIT OF THE PUBLISHER OF SAID NEWSPAPER; THAT NO AGREEMENT OR UNDERSTANDING FOR THE DIVISION OF THE FEE HAS BEEN MADE WITH ANY PERSON, AND THAT NO PART OF THE FEE HAS BEEN AGREED TO BE PAID TO ANY OTHER PERSON.

SUBSCRIBED AND SWORN TO BEFORE ME THIS 13TH DAY OF DECEMBER A.D., 2017

Kim Ehler

NOTARY PUBLIC, COUNTY OF HUTCHINSON, SOUTH DAKOTA

SEAL | KIM EHLER Notary Public South Dakota

MY COMMISSION EXPIRES
JANUARY 12, 2022

PUBLIC INPUT ENCOURAGED!

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To learn more about this project and to share your ideas, join us at:

December 13, 2017 • 5:00 p.m. – 8:00 p.m.
Tripp Legion Hall • 102 N Main Street
Tripp, SD 57376

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration, Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By fax to (406) 255-2900
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 13, 2018.

tion carried.

The date of the next council

cost of $5...

Affidavit of Publication

STATE OF SOUTH DAKOTA
COUNTY OF BON HOMME
CITY OF AVON
SCHOOL DISTRICT 4-1

Jackson S. Brodeen

Of said county and city, being duly sworn, on oath says that he is the PUBLISHER of the Avon Clarion, a weekly newspaper, printed in Armour, SD, published in Avon, said county of Bon Homme and his full and personal knowledge of all the facts herein stated; that said newspaper is by declamation the official city newspaper, the official newspaper of School District 4-1, is published 52 weeks a year, has been legally published for an excess of one year under second class permit, with an excess of 200 copies per week, and is distributed wholly or in part in the City of Avon. The above swears that the

Western Area Power Administration Notice

A printed copy of which, taken from the paper in which the same was printed and published, is attached to this sheet, and made part of this affidavit, was published in said newspaper at least once a week for 3 successive weeks on the day of each week on which said newspaper was published, towit:

Wednesday.....................Nov. 29, 2017
Wednesday.....................Dec. 6, 2017
Wednesday........................Dec. 13, 2017

That the full amount of fee charged for publication of this notice, $198.00 insures to the benefit of the publisher of said newspaper, that no agreement or understanding for the division thereof has made with any person, and, that no part has been agreed to be paid to any person whatsoever.

Subscribed and sworn to before me

This 3rd day of Jan. 3, 2018

....

Notary Public, South Dakota

My commission expires....7-31-21........

PUBLIC INPUT ENCOURAGED!

Public comments are sought to define the scope and alternatives for an Environmental Assessment of a proposed wind energy facility located in Bon Homme, Charles Mix, and Hutchinson Counties between the towns of Avon, Tripp, and Wagner, South Dakota. The proposed project, to be called Prevailing Wind Park, would include up to 100 wind turbine generators, an underground power collection system, project substation, access roads, and a maintenance and operation center. The project would also include an overhead gen-tie line from the project substation to Western Area Power Administration's (WAPA) Utica Junction Substation within Bon Homme and Yankton Counties. Construction of the Prevailing Wind Park is proposed to begin as early as mid-2018.

Western Area Power Administration will hold one public scoping meeting (open house format) to provide an opportunity for interested parties to discuss the project with the project developer (Prevailing Winds, LLC) and resource specialists and to submit comments. The meeting will be held on Wednesday, December 13, 2017, from 5:00 p.m. to 8:00 p.m., at the Tripp Legion Hall.

To learn more about this project and to share your ideas, join us at:

December 13, 2017 • 5:00 p.m. – 8:00 p.m.
Tripp Legion Hall • 102 N Main Street
Tripp, SD 57376

Comments may be submitted in the following ways:

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  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North
  Billings, MT 59101
- By fax to (406) 255-2900
- By email to gomer@wapa.gov
- In writing at the public scoping open house meeting.

Comments should be postmarked no later than January 13, 2018.

Department of Energy
Western Area Power Administration
Upper Great Plains Customer Service Region
P.O. Box 35800
Billings, MT 59107-5800

B0401.BL

JAN 2 2 2019

Dear Customers and Interested Parties:

This letter is to update you on the proposed Prevailing Wind Park Energy Facility Project (Project) and to request your input on the Project. Prevailing Wind Park, LLC proposes to construct a 216.6 megawatt wind farm in Bon Homme, Charles Mix, and Hutchinson Counties, South Dakota. The Project would include 61 wind turbines, associated access roads, underground electrical power collector and communications systems, a new Project collector substation, up to four permanent meteorological towers, an operations and maintenance (O&M) facility, and a 27.6-mile-long 115k kilovolt electric transmission line. The Project proposes to interconnect with Western Area Power Administration's (WAPA) Utica Junction Substation.

The proposed interconnection is a Federal action under the National Environmental Policy Act of 1969. As a result, a draft Environmental Assessment (EA) has been prepared to analyze the environmental effects of the proposed Project on resources such as wetlands, vegetation and wildlife, cultural and recreation resources, as well as other social, economic, and environmental effects.

WAPA is requesting your review and comment on the draft EA, which is available for download at the following website:
https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWinds.aspx. Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  6th Floor, Attn: Ms. Christina Gomer
  2900 4th Avenue North
  Billings, MT 59101
- By email to gomer@wapa.gov
- By phone to (406) 255-2811
- By fax to (406) 255-2900

For your input to be considered, comments must be received no later than Friday, February 22nd, 2019. If you have any questions or need more information about the Project, please contact WAPA using the methods listed above or visit the Project website, also listed above. Thank you for your time and interest in the Project.

Sincerely,

Christina Gomer

Christina Gomer
NEPA Coordinator

SDNA

SOUTH DAKOTA NEWSPAPER ASSOCIATION

We've got South Dakota covered.

AFFIDAVIT OF PUBLICATION

I hereby certify that the public notice "Western Area Power Admin/Prevailing Winds Park Public Input Encouraged" ran as requested on Jan. 30, Feb. 6 and Feb. 13, 2019 in the Avon Clarion (Avon,SD).

By: South Dakota Newspaper Services

Signature: Sandy DeBeer

Print Name: Sandy DeBeer, Advertising Placement Coordinator

Date: 3/11/2019

AFFIDAVIT OF PUBLICATION

STATE OF SOUTH DAKOTA
COUNTY OF HUTCHINSON

SCOTT E. EHLER, BEING DULY SHORN, SAYS: THAT THE PARKSTON ADVANCE IS, AND DURING ALL THE TIME HEREINAFTER MENTIONED WAS, A WEEKLY LEGAL NEWSPAPER AS DEFINED IN SDCL 17-2-2.1 THROUGH 17-2-2.4 INCLUSIVE, AS AMENDED, PUBLISHED AT PARKSTON, HUTCHINSON COUNTY, SOUTH DAKOTA BY THE PARKSTON ADVANCE, INC.; THAT AFFIANT IS AND DURING ALL OF SAID TIMES WAS, AN EMPLOYEE OF THE PUBLISHER OF SUCH NEWSPAPER AND HAS PERSONAL KNOWLEDGE OF THE FACTS STATED IN THIS AFFIDAVIT; THAT THE NOTICE, ORDER OR ADVERTISEMENT, A PRINTED COPY OF WHICH IS ATTACHED, WAS PUBLISHED IN SAID NEWSPAPER FOR 3 SUCCESSIVE ISSUES, BEARING THE FOLLOWING DATES:

FEBRUARY 6, 2019
FEBRUARY 13, 2019
FEBRUARY 20, 2019

THAT THE FULL AMOUNT OF THE FEE CHARGED FOR PUBLISHING $157.50 INURES SOLELY TO THE BENEFIT OF THE PUBLISHER OF SAID NEWSPAPER; THAT NO AGREEMENT OR UNDERSTANDING FOR THE DIVISION OF THE FEE HAS BEEN MADE WITH ANY PERSON, AND THAT NO PART OF THE FEE HAS BEEN AGREED TO BE PAID TO ANY OTHER PERSON.

[signature]

SUBSCRIBED AND SWORN TO BEFORE ME THIS 20TH DAY OF FEBRUARY A.D., 2019

Kim Ehler

NOTARY PUBLIC, COUNTY OF HUTCHINSON, SOUTH DAKOTA

SEAL | KIM EHLER Notary Public South Dakota

MY COMMISSION EXPIRES JANUARY 12, 2022

PUBLIC INPUT ENCOURAGED!

Public review and comments are sought on a draft Environmental Assessment of a proposed wind energy facility located in Bon Homme, Charles Mix, Hutchinson, and Yankton counties between the towns of Avon, Tripp, and Wagner, South Dakota.

The proposed project, called Prevailing Wind Park, would include up to 61 wind turbine generators, associated access roads, an underground power collection system and communications system, a new project collector substation, up to four permanent meteorological towers, and an operations and maintenance facility. The project would also include a 27.6-mile 115-kilovolt overhead electric transmission line to interconnect the project substation with Western Area Power Administration's Utica Junction Substation.

The proposed interconnection is a Federal action under the National Environmental Policy Act of 1969. As a result, the draft Environmental Assessment has been prepared to analyze the effects of the proposed project on resources such as wetlands, vegetation and wildlife, cultural and recreation resources, and other social, economic, and environmental resources.

Western Area Power Administration is requesting your review and comment on the draft Environmental Assessment, which is available for download at the following website:

https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWind.aspx

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By phone to (406) 255-2811
- By fax to (406) 255-2900
- By email to gomer@wapa.gov

Comments must be received no later than February 25, 2019.

Affidavit of Publication

State of South Dakota }
County of Bon Homme } ss

Rebecca Tigs ....Being first duly sworn says that the **Tyndall Tribune & Register** is a legal weekly newspaper for publication of legal and other official notices as required by Chapter 298 of the Session Laws of South Dakota, 1939; that it has bona fide paid circulation of more than two hundred copies weekly; that it is published in English language in the City of Tyndall, Bon Homme County, South Dakota, and has been admitted to the United States mail under second class mailing privilege for more than one year prior to the first publication of the notice herein mentioned, and that it is printed in an office maintained at the place of publication at Tyndall, South Dakota, and that deponent is the publisher in charge of the advertising department of said newspaper; that the advertisement headed

2x5 Public Input Encouraged

WAPA / Pr. Winds

a printed copy of which is hereto attached, was printed and published in said newspaper for three successive weeks, upon the following dates:

Jan 30 20 19	........................20......
Feb 6 20 19	........................20......
Feb 13 20 19	........................20......
........................20......	........................20......

That the full amount of the fee charged for the publication of said notice, $144.60, inures to the benefit of the publisher of said newspaper, that no agreement or understanding for the division thereof has been made with any other person, and that no part has been agreed to be paid to any person whomsoever.

Rebecca Tigs, publisher

Subscribed and sworn to before me this

13 day of Feb 20 19.

Peggy Schelske

Notary Public, South Dakota

My Commission expires Oct. 24, 2021

PEGGY SCHELSKE
Notary Public
SEAL
South Dakota

PUBLIC INPUT ENCOURAGED!

Public review and comments are sought on a draft Environmental Assessment of a proposed wind energy facility located in Bon Homme, Charles Mix, Hutchinson, and Yankton counties between the towns of Avon, Tripp, and Wagner, South Dakota.

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Western Area Power Administration is requesting your review and comment on the draft Environmental Assessment, which is available for download at the following website:

https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWind.aspx

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  Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By phone to (406) 255-2811
- By fax to (406) 255-2900
- By email to gomer@wapa.gov

Comments must be received no later than February 25, 2019.

Affidavit of Publication

State of South Dakota }
County of Bon Homme } ss

Rebecca Uy Being first duly sworn says that The **Scotland Journal** is a legal weekly newspaper for the publication of legal and other official notices as required by the South Dakota Revised Code of Nineteen Hundred Nineteen, and any amendments thereof, printed and published in the City of Scotland, County of Bon Homme, and State of South Dakota, and has been such a legal newspaper during the time hereinafter mentioned, with a bona fide circulation of at least 250 copies weekly, and published within said county for more than 52 successive weeks prior to the first time herein mentioned and is printed in the English language in whole or in part in an office maintained at the place of publication and that deponent is the publisher in charge of the advertising department of said newspaper; that the advertisement headed

2x5 Public Input Encouraged
WAPA/Pr Winds

a printed copy of which hereto attached, was printed and published in said newspaper for three successive weeks, upon the following dates:

Jan 30 2019	.... 20.....
Feb 6 2019	.... 20.....
Feb 13 2019	.... 20.....
.... 20.....	.... 20.....

That the full amount of the fee charged for the publication of said notice, $142.20 inures to the benefit of the publisher of said newspaper, that no agreement or understanding for the division thereof has been made with any other person, and that no part has been agreed to be paid to any person whomsoever.

Rebecca Uy, publisher

Subscribed and sworn to before me this

13 day of Feb, 2019

PEGGY SCHOESKE
Notary Public
SEAL
South Dakota

Peggy Schoeske

Notary Public, South Dakota

My commission expires 10-24-2021

PUBLIC INPUT ENCOURAGED!

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Comments must be received no later than February 25, 2019.

Ever heard of Jenny's Gulch? It was new to me

Rog's Rod & Nimrod

by Roger Wiltz of Wagner, hunting and fishing enthusiast

On the weekend of February 1st, Betsy and I traveled out to Spearfish to visit our longtime friends, Art and Janice Jones. Art is the best all-around fisherman I know, and I know a lot of good fishermen.

Via cell phone on the way out, Art had conveyed to us that he was fishing, and that we might arrive at his home before he did. I was excited to hear this, and I looked forward to seeing what he would bring home. I pictured some trout, a natural association with Hills fishing. I had actually packed along my favorite ice rod along with a carton of wax worms in the event we might find time to fish.

Imagine my surprise when he dumped his and his partner's catch on the fish-cleaning table in his shop. There were limits of thick 8+ inch bluegills, a half dozen northern pike that were already "getting broad in the shoulders," and five hefty rainbow trout that ran around 17 inches in length. I was thinking "prairie stock dam" when I asked Art where they came from. I was stunned when he said "Jenny's Gulch." What the heck was Jenny's Gulch? Art responded that it was a part of the Pactola reservoir accessible by way of Hwy 385.

While we filleted the fish, I was elated to hear Art's plans for tomorrow. In order to get to his favorite spot, we would be at the Gulch boat ramp before sunrise. On Friday the 1st we fished into the mid-afternoon. The stark mountainsides and jagged ledges that rose above us were awesome to say the least. I hadn't fished such beautiful surroundings since British Columbia's Queen Charlotte Islands or Arizona's Lake Powell. On occasion, an eagle would swoop down from a nearby pine and snatch one of our fish from the ice surface.

Art's Yamaha ATV pulled his pop-up as well as his gear-filled sled across the ice as it carried us about a half mile down the gulch. We hadn't gone far enough to view the main reservoir. Art's auger, powered by a Milwaukee half-inch battery-powered drill, easily cut through the foot thick ice. We were soon surrounded by tip-ups baited with live four-inch shiners. We jigged wax worms on sixteenth ounce jigs just off of the bottom. Art lowered the transducer of his Vexilar into my hole. What an instrument! It was my first experience with a Vexilar.

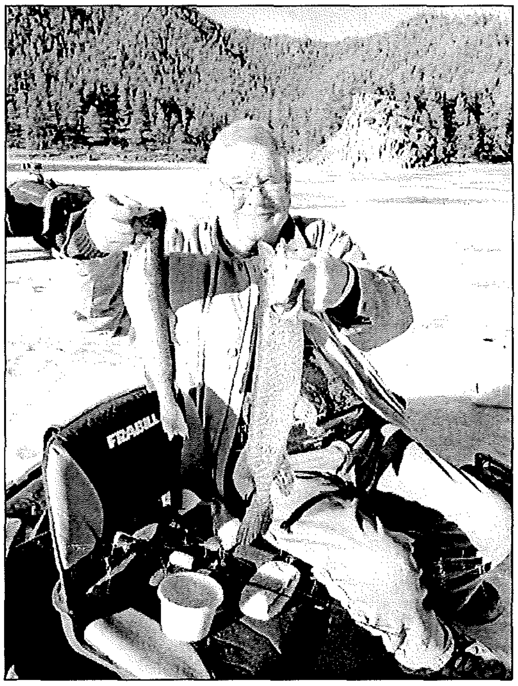
The very entertaining Vexilar not only indicated the depth, but it also depicted my baited hook as it fell toward the bottom. I could watch my baited hook, and I could monitor fish as they swam up to my bait. Sometimes they would gobble the bait, and other times they would merely watch it and then swim off.

The action was not as good as the previous day's, but we still brought home 20 large bluegills, a northern pike caught on a tip-up, and Art's fat 19 inch rainbow. A very large rainbow broke my line just before we wrapped it up for the day. I didn't stand a chance with my small bluegill rig. If one wanted a rainbow for the wall, a few days on Pactola would yield it. I would suggest having a gaff nearby to get the fish up through the hole.

Other than rigging tip-ups for large rainbows, twenty-pound northern pike roam Pactola as well as monster lake trout.

We are all aware of the technology that kept Art up to date with his friends who fished for walleyes near the Platte-Winner Bridge as we fished Pactola. It was almost like being together as the Francis Case guys would send pictures of their walleyes along with a verbal play by play. They described the walleye action as "fish nearly jumping from the holes." Limits on Francis Case came easily that day.

I saw many families on Pactola the day we fished, and I would recommend a "Jenny's Gulch" Black Hills getaway in a heartbeat.



Roger with a rainbow trout and a northern pike from the same Pactola waters.

JOB OPENING
SPEECH/LANGUAGE PATHOLOGY ASSISTANT
for the 2019-2020 School Year
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Carol Rempp, Director
South Central Cooperative
Box 430
Tyndall, SD 57066
Phone: 1-800-568-4193
Email: carol.rempp@k12.sd.us

Pub: Jan. 23 Feb. 13c

Summer Camping Reservations Open Soon In State Parks

PIERRE, S.D. – February 16 is the first day to make camping reservations for a Friday, May 17, arrival – the State Parks' Open House Weekend and traditional kick-off to the summer season.

Reservations for other summer dates will follow in succession, becoming available 90 days before arrival; over 40 parks offer camping reservations on the 90-day schedule. The exception is Custer State Park, which offers reservations one year before arrival.

State Parks Director Katie Ceroll encourages campers to keep an eye on the calendar and make reservations for camping trips as soon as possible. Memorial Day reservations open February 23 for a Friday arrival, and campers can reserve for Father's Day weekend starting March 16.

"The sooner you can plan your camping trip, the better," said Ceroll. "Campsites at popular parks go quickly."

New this year, campers can now reserve handicap campsites online by providing their ADA/Handicap Placard ID. In the past, those reservations had to be made by phone.

Campsites become available at 7 a.m. Central Time on the first day of the 90-day window, but reservations for available campsites can be made until the day you arrive.

Reservations can be made online at campsd.com or by calling 1.800.710.2267. Taxes and reservation fees may apply.

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Western Area Power Administration is requesting your review and comment on the draft Environmental Assessment, which is available for download at the following website:
https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWind.aspx

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By phone to (406) 255-2811
- By fax to (406) 255-2900
- By email to gomer@wapa.gov

Comments must be received no later than February 25, 2019.

Grab that rifle and head for the pickup!

Rog's Rod & Nimrod

by Roger Wiltz of Wagner, hunting and fishing enthusiast

When Brian Maas of Parkston first let me know about the Sinkebeil wolf a few weeks ago, he sent me some photos that were not used with my column or in the stories that followed in newspapers, on television, and Facebook, etc. Pictured on one of those photos was the wolf lying next to a coyote and a fox. Jim Sinkebeil and Jim More bagged more than the wolf that morning.

If you think about it, there is no easier hunt than grabbing your varmint rifle and climbing into the pickup an hour before sunup on any given morning. Special dress, equipment, and a place to hunt are not an issue. I must caution that popping a coyote that is two hundred yards out in a stubble field and then retrieving it is trespassing. Granted, most farmers, for the sake of calves and pheasants, want to see coyotes/foxes controlled, but it is still important to know the mindset of the property owners.

My last early morning road hunting adventure was years ago. Against the snow, I spotted a fox along a fence line that was a quarter mile out. I was shooting a Winchester Model 70 in .264 Magnum as I didn't own a more suitable rifle at the time. I aimed a few inches high and knocked him over. That big rifle did too much pelt damage, and the .223 I shoot today would have been vastly superior. As far as what's best, the .243 Winchester is a better varmint caliber than any .22 caliber ever made. With our new governor going back to a bounty system, what I'm talking about today will become increasingly popular.

****

I can't resist relating the following story. The home of LuAnn, our youngest daughter, and her husband, Mark, lies along the shore of Madison, Wisconsin's Lake Mendota. There is a fireplace in the east facing living room that looks out over the lake. Next to the fireplace is a basket filled with furry little doggie toys that their two lapdog pets like to toss around. On the top of the toy pile was what appeared to be a furry white doggie toy.

On the west side of the house at ground level is a little doggie door just large enough for the dogs to crawl through when they need to go outside. The two dogs love to sit on the window ledge and watch for squirrels. When a squirrel is spotted, the race is on as the dogs speed across the living room floor and head or their doggie door.

Yesterday, as LuAnn and Mark enjoyed their fireplace when it was sixteen degrees below zero F. outside, that furry white "doggie toy" scurried out of the toy basket and led the dogs on a merry chase through the house. That white "doggie toy" was a weasel, one of the fiercest little animals known to man. So far as they know, the dogs didn't catch the weasel (fortunately for them), and the weasel did not exit through the doggie door.

When I sleep, my arm often hangs over the bedside, allowing my fingertips to touch the floor. If I knew there was a weasel in my house, I think my arm would be tucked in beside me. I related this story to Dave, the Wagner exterminator last night, and he said that the weasel can be trapped. Good luck, LuAnn.

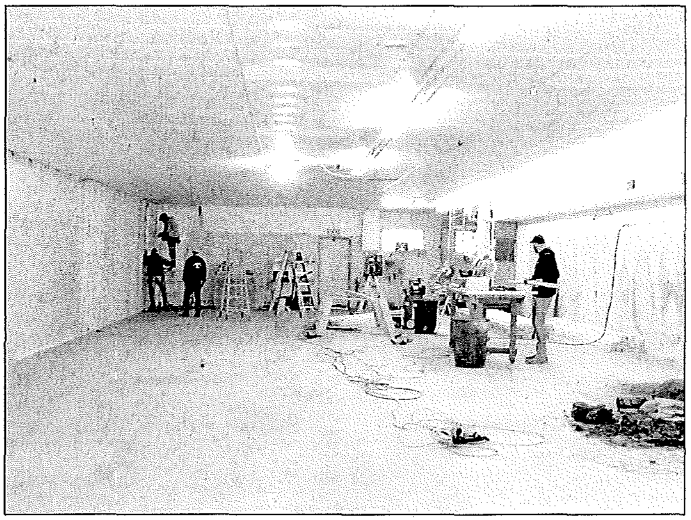
****

SD Game, Fish, & Parks recently released the deer season dates for 2019. While the Black Hills season opens on the traditional November 1st, West River opens November 16th while East River opens November 23rd. This is a week later than usual, and I believe it will affect the harvest.

Why? Deer are more vulnerable during the rut. Typically, at least in my estimation, The West River season catches the rut, and the rut is winding down come East River hunting. With the season a week later, East River hunters might be pursuing bucks that are far more wary. Let me know your thoughts.

Walleye action through the ice is the ticket at Pickstown right now. Successful anglers have been using minnows on *Rapala Jiggin' Raps.*

See you next week..... hopefully with a firsthand ice fishing report.



Kevin Eben and Don Kocmich, along with some of the crew work on their new project on Main Street Tuesday afternoon

Schultz Redi Mix Buys True Value for recreation entertainment

Kevin Eben and Don Kocmich, *owners of Schultz Redi Mix, LLC have* recently took on a new job. They bought the old True Value Store, which was vacated this summer, have gutted it, are insulating it, sheet-rocking and other improvements, along with some outside *work on the block work.*

They hope within the month, a new recreation center, including two golf simulators, pool table, foosball, and a on-sale beer license with a small bar in the middle of the store.

Eben and Kocmich put in their request for the beer license at the City Council Meeting on Monday night and hope to get that approved in the next month.

Avon Council Advertises for Summer Help

The Avon City Council met this past Monday night at the Avon City Office with all members present including Mayor Gill, Finance Officer Simmons, Kevin Eben and Don Kocmich.

Much of the meeting was focused on the new business venture of Kevin Eben and Don Kocmich in the old True Value Store that will a couple golf simulators, pool, darts and foosball, a family oriented club house type of hang-out, with some big screen TV's, serving up pizza, frozen/microwave sandwiches and chips, along with a cold beer if so inclined.

High school kids out for golf often have a hard time getting out to the golf course in the spring, because of the weather, they thought the golf simulators may also come in handy for them as well.

The beer license applied for by the two was approved by the Council but a public hearing will have to be held before continuing.

They hope to be open in three to four weeks, depending on the beer license.

Also on the agenda was to advertise for summer help. Along with the normal lifeguard help, a pool manager, concessions, coaches and ball concessions, a part-time police officer is needed, as Don Mudder did not renew his police status.

Look for advertisement in this Clarion and applications are due by February 22.

Gill talked about the construction workers that will be coming into town this summer to build the new wind farm. He said many will have campers that would need hookups and others will be looking for a place to live for the summer.

The old "Mike Carpenter" house that was torn down this summer could hold up to possible three hookups for campers. Gill was going to talk to Schultz and see when he could get that going.

NWPS made kind of a mess by the softball field and they will level as soon as the frost comes out.

JOB OPENING
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for the 2019-2020 School Year Open Until Filled

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Carol Rempp, Director
South Central Cooperative
Box 430
Tyndall, SD 57066
Phone: 1-800-568-4193
Email: carol.rempp@k12.sd.us

Pub. Jan. 23-Feb. 13c

PUBLIC INPUT ENCOURAGED!

Public review and comments are sought on a draft Environmental Assessment of a proposed wind energy facility *located in Bon Homme, Charles Mix, Hutchinson, and Yankton* counties between the towns of Avon, Tripp, and Wagner, South Dakota.

The proposed project, called Prevailing Wind Park, would include up to 61 wind turbine generators, associated access roads, an underground power collection system and communications system, a new project collector substation, up to four permanent meteorological towers, and an operations and maintenance facility. The project would also include a 27.6-mile 115-kilovolt overhead electric transmission line to interconnect the project substation with Western Area Power Administration's Utica Junction Substation.

The proposed interconnection is a Federal action under the National Environmental Policy Act of 1969. As a result, the draft Environmental Assessment has been prepared to analyze the effects of the proposed project on resources such as wetlands, vegetation and wildlife, cultural and recreation resources, and other social, economic, and environmental resources.

Western Area Power Administration is requesting your review and comment on the draft Environmental Assessment, which is available for download at the following website:
https://www.wapa.gov/regions/UGP/Environment/*Pages/PrevailingWind.aspx*

Comments may be submitted in the following ways:

- By mail to:
  Western Area Power Administration
  Attn: Ms. Christina Gomer
  2900 4th Avenue North, Billings, MT 59101
- By phone to (406) 255-2811
- *By fax to (406) 255-2900*
- By email to gomer@wapa.gov

Comments must be received no later than February 25, 2019.

Of Ice Fishing and Gun Shows

Rog's Rod & Nimrod

by Roger Wiltz of Wagner, hunting and fishing enthusiast

As most of my recent ice fishing adventures have either been on Wisconsin lakes with my son-in-law, Tom, or on small SD dams where I was alone at the time (very unwise), I've been completely out of touch with the latest trends in SD ice fishing. Yesterday's trip to Burke Lake brought me up to speed with today's modus operandi. It was a shock to my system.

To the many anglers on the lake, it appeared that I had stepped out of the '70's. One kid had never seen a manual ice auger. I was walking and carrying my gear – rods, auger, skimmer, seat, bucket, etc. Everyone else drove their own ATV's as they buzzed around the lake, drilled holes with power augers, and checked the holes for fish with their Vexilars. The guy next to me had his pop up tent hooked up to a front end loader on his ATV so that with the push of a lever he was set up and ready to go! These ATV's were simply driven on and off of trailers pulled by pickups parked near the boat ramp.

I hope I don't sound critical of my fellow anglers. It's more like I'm jealous. I slipped and fell down, and some guys from Corsica hurried over to help me up. These same guys told me that the day was slow, but they showed me some very nice crappies and perch. They told me that the crappies were much larger than last year's. They also had a good northern pike.

I used wax worms on tear dots, and fished just off of the bottom. Other than small bluegills, I caught perch from what I will call four different age groups. The largest was 11 inches long. Jack Broome, the Guru of Gregory County ice fishing, told me that the key to success on Burke Lake is getting out early. I'll follow his advice next time.

Regarding the Parkston wolf, she weighed 60 pounds – typical for a female Minnesota timber wolf. The DNA testing hasn't been done yet as the lab is closed down as a result of the government shutdowns.

****

If there is such a thing as "The Event" for South Dakota hunters and gun nuts, I would have to name the Sioux Falls Gun Show known as "The Big One." It is sponsored by The Dakota Territory Gun Collectors Association, and it's on February 9th and 10th at the Sioux Falls Convention Center. I don't often give advice or get technical, so please bear with me today.

If you put any stock in my opinions, you might keep an eye out for an Austrian made Steyr Model 1956 bolt-action carbine. It will also say "Daimler-Puch" on the receiver. The rifle features a full-length Mannlicher stock, a "butter knife" bolt handle, double-set triggers, and a release button on the top right side of the receiver that releases all cartridges without cranking them through the action. This rifle is light in weight and extremely accurate.

I've personally handled all of the elite rifles including the Krieghoffs, Blausers, and Rigbys at both the Safari Club International and the Dallas Safari Club expos, and I believe that this Steyr is the finest rifle ever made. This rifle has enabled me to shoot with extreme accuracy in spite of my tremor.

I first saw one of these rifles during a 2002 hunt in South Africa. The .300 magnum was carried by Jon Dirkse Dorfling, my guide or professional hunter. He puts his life in the hands of this rifle. I later read about the same rifle in a gun magazine where the author named it one of the top ten rifles ever made. I came across one a year later in a Rapid City gun shop that held it for me with a down payment. Within a year the rifle was mine. I paid $1200 for it. Mine is in .30-06 caliber.

I'm telling you this because you might find one at the Sioux Falls show. At the most recent Rock Island Auction Company sale, a Model 1956 Steyr in .243 Winchester caliber went for $3450. It was in 99% condition. I believe that you might find one for the $1200 figure I paid. If you buy it, you'll call and thank me in a couple of years.

Don't forget the Mitchell gun show on March 9th and 10th. See you next week.

Revitalizing Rural South Dakota

By Governor Kristi Noem

January 25, 2019

Hometowns are the heartbeat of South Dakota. I'm proud to be from a rural hometown. It's where I learned the values of hard work and self-reliance, where Bryon and I chose to raise our kids, where we started an insurance business and hunting lodge, and where my family has farmed and ranched for a century. But many small towns like ours are struggling today.

In South Dakota, according to our most recent statistics, we have 15,363 job openings and 13,500 people actively looking for work. Unfortunately, what we have is a skills gap – those unemployed workers don't have the skills necessarily to fill the open jobs.

I strongly believe that the best way to prepare our young people for their careers is through work experience. Over the coming year, I'm asking school leaders to work with me to dramatically increase work experience in our high schools. We need more CTE and skills training in high school. We need more apprenticeship programs. And we need more opportunities for young people to get out of the classroom and experience a real job.

I would like our high schools to join together each year to hold a "Week of Work." This will be a special week when every high school student will get out of the classroom to experience a day on the job. I hope this can lead to schools coordinating more internships and experience-based classes.

Another state-imposed barrier to workforce can be professional licensure. I am directing the Department of Labor and Regulation, over the next year, to work with our professional organizations and licensure boards to conduct a full review of licensing requirements. We need to consider the elimination of unnecessary licenses, opportunities to streamline the licensure process, and options to fast-track licenses for apprentices, in-state graduates, veterans, and military personnel and their families. We can't let unneeded red tape get in the way of growth.

Furthermore, I want to break down barriers to help fill workforce shortages. In our smaller communities and more rural areas, affordable housing creates difficulties for employers. Earlier this year, I announced a pilot project by the South Dakota Housing Development Authority to help fix this problem. We will be building new modular multi-housing units, called DakotaPlex, at the state prison facility in Springfield. It will be similar to the Governor's Houses, but built as duplex, triplex, or quadriplex units. South Dakota communities of less than 5,000 people will be eligible to purchase these units and offer them for rent at affordable levels. I'm confident this new project will help our smaller communities expand housing options for workers.

I believe the most sustainable way to strengthen rural communities is to expand economic opportunity, and that can only come from a healthy workforce. I am fully committed to revitalizing South Dakota's rural culture so small-town schools and businesses can thrive for generations to come.

SD Game Fish and Parks 3rd and Final Annual Deer Roundup

A South Dakota Game, Fish & Parks specialish nets and tags a deer just outside Avon Sunday

Sunday morning a group of regional wildlife scientists and a couple South American pilots got together for the last deer roundup south of Avon. In years past they focused on the adult whitetail population. This year they targeted the 6 month old deer which were caught with a net dropped by the helicopter crew. Then expandable collars were put on them so they could be monitored monthly to determine their locations. If a collar stops moving, a team will be sent to find the collar to determine if the deer has died or just lost the collar. A few years ago, disease had claimed a good portion of the population. It seems the findings from the last few roundups have shown the population is rebounding. It was reported that many of the deer seen in this area were young males with short forklike antlers. No mule deer were seen. While it is the final year of deer roundups, the collars will be monitored through 2022.

The area covered by research spread from northern Huron and Wessington down to a southern area by Avon including 13 counties. Collars were to be placed on 110 six month old whitetails. The information from these roundups and radio collars will improve how deer licenses are allocated and also help to better manage whitetailed deer in habitats similar to our area. Randy Johnson, a Wildlife Resource Biologist from Sioux Falls and cohorts Aaron and Emily were very informative. Randy said to be sure to thank the private landowners as this would not be possible without their support.

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APPENDIX R - AGENCY CORRESPONDENCE AND PUBLIC COMMENTS

Letter Number	Comment Number	Entity	Date of Comment	Comment	Response	Section in EA/PEIS	Comment Topic
Scoping							
A	1	Private Citizen	12/9/2017	I am writing to voice my strong opposition to Prevailing Winds, LLC's plan to develop an industrial wind farm in Bon Homme County, South Dakota. There are numerous reasons that this project should not be developed - too many to innumerate in this short letter. The most serious concerns surround the fact that there is so much conflicting information available. What is so striking are the claims from the wind Industry that there are virtually no adverse health effects, no unreasonable noise, very minimal Impact to the environment, no real safety issues, no devaluation of property - yet those biased studies are debunked time and time again by real people living near real wind projects. Independent, objective studies - those that are not funded by the wind industry- are clear: Wind farms should not be developed too near people's homes or farm land. And courts all over the world are affirming that living too close to a wind turbine causes human harm.	WAPA's review of socioeconomic impacts (such as property values) and human health (such as shadow flicker, infrasound), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	Appendix M, 3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
A	2	Private Citizen	12/9/2017	I am concerned with the numerous adverse effects that industrial wind farms bring to a community, and I shudder to think of what South Dakota will look like when these behemoths are built from border to border. The sky is filled with red blinking lights every.single.night. Our nightmares begin before we even fall asleep!	Comment noted.	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual
A	3	Private Citizen	12/9/2017	And what happens when these 500-600 foot turbines are no longer working? (A drive through the countryside today shows the remains of hundreds of old, relatively small windmills.) Who will take the turbines down then?	As stated in the EA Section 4.7.1, inoperative turbines shall be repaired, replaced, or removed quickly. Nacelle covers and rotor nose cones shall always be in place and undamaged. At the end of the Project's operational life, the Project will be decommissioned. A decommissioning plan was developed for the wind farm portion of the Project and is available on the PUC's website (https://puc.sd.gov/commission/dockets/electric/2018/EL18-026/prefiledexhibits/prevailing/a11-2.pdf). Information about decommissioning the gen-tie transmission line is available upon request.	Chapter 3, 3.5 of the PEIS Chapter 2 of the EA	Decommissioning
A	4	Private Citizen	12/9/2017	These developers come in to a community with their scam, pit neighbor against neighbor, build the project, and then move on to the next unsuspecting town. The most beautiful, tranquil areas of our state are slated to become polluted by Big Wind. Yes, polluted - visually.	Comment noted.	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual
A	5	Private Citizen	12/9/2017	And the real irony is that they don't even deliver on their promises! Wind energy is NOT green. There is no benefit to the area in the form of lower electricity costs (in fact, electric bills increase), the promised funds to the town and school do not counter the loss due to the decreased tax base as people leave or do not build in the area (for obvious reasons.)	Comment noted.	3.10 and 4.10 of the EA 4.10 and 5.10 of the PEIS	Economics
A	6	Private Citizen	12/9/2017	They don't deliver on their promises. They are for-profit businesses whose primary goal is to make money. When the tax subsidies run out, these developers will not be able to continue. And I, for one, will be praising God on that day!	Comment noted.	No section.	General
B	1	Private Citizen	12/18/2017	I attended an open meeting on this project. It is so encouraging to see S. Dakota embrace the use of our natural resource. This will eventually help so many electricity users. My hope is that we continue to see turbines, state wide. Thank you for such a large investment.	Comment noted.	No section.	General

C	1	Private Citizen	12/13/2017	I think that the Prevailing Wind Project is very important to the economy of the local area & I think it would benefit all. I would encourage you to support this project.	Comment noted.	No section.	General
D	1	Bureau of Indian Affairs	11/29/2017	We received your letter regarding the proposed Prevailing Wind Park Wind Energy Facility Project. We have considered the potential for both environmental damage and impacts to archaeological and Native American religious sites on lands held in trust by the Bureau of Indian Affairs, Great Plains Region. You should be aware; however, that Tribes or Tribal members may have lands in fee status near the sites of interest. These lands would not necessarily be in our databases, and the Tribes should be contacted directly to ensure all concerns are recognized.	WAPA has initiated tribal consultation with eight tribes, beginning on July 10, 2017. The EA contains a more detailed timeline of WAPA's coordination with Native American Tribes.	6.3 of the EA	Cultural
D	2	Bureau of Indian Affairs	11/29/2017	We have no environmental objections to this action as long as the project complies with all pertinent laws and regulations.	Comment noted.	No section.	General
D	3	Bureau of Indian Affairs	11/29/2017	We also find that the listed action will not affect cultural resources on Tribal or individual landholdings for which we are responsible. Methodologies for the treatment of cultural resources now known or yet to be discovered- particularly human remains - must nevertheless utilize the best available science in accordance with provisions of the Native American Graves Protection and Repatriation Act, the Archaeological Resources Protection Act of 1979 (as amended), and all other pertinent legislation and implementing regulations.	If any inadvertent discoveries are made during project implementation, work will cease in the area of discovery and the THPO will be contacted within 72 hours.	3.8, 3.9, 4.8, and 4.9 of the EA	Cultural
E	1	Private Citizen	12/27/2017	I attended the scoping meeting in Tripp, SD on December 13, 2017. I had a nice visit with the project engineer. He had some real good info for this planned project. I would be more than happy to have wind energy produced on my farmland. I was originally signed up for the first wind turbine project that included my land in Douglas and Charles Mix counties. According to the new project under consideration, my land in Douglas County is not included. The project engineer state that the plan is to stay out of Douglas County. The wind in this area is very good. I have been interested in wind energy way back when Charles Mix Electric (REA) sent out a survey to see if anyone was interested in harvesting electricity by wind. I know that not everyone can get a wind turbine on their land, but I hope you will consider my land for this project. I don't have many acres so my changes may be slim. There are some landowners who already have several turbines and are greedy and want more. I hope you will also consider my land.	Comment noted.	No section.	General
F	1	Bureau of Land Management	11/28/2017	We received your letter dated 11/20/17 about the Prevailing Wind Park project. Would you please send us a GIS shapefile of the project boundary as shown on map you included with this letter. It would helpful if you would also send the PLSS data for this area as well. Thank you for the opportunity to comment.	WAPA responded via email on 2/12/18, indicating the Developer/Developer's consultant was preparing the information and the GIS would be transmitted, once available. As this project is still in the scoping phase, the Developer has not finalized the locations of facilities within the project boundary. The Developer sent the GIS files 3/15/2019.	No section.	General
G	1	Private Citizen		I am writing to provide comments in regards to your notification letter regarding the proposed Prevailing Wind Park. I encourage you to avoid allowing Prevailing Winds, LLC massive footprint to engulf 47,000 acres of this pristine, aesthetic region of rural America. The agricultural splendor, wildlife habitat and great people who have made it their home for	Comment noted.	No section.	General

				generations do not deserve the life altering ill effects associated with the transition into an industrial wind park.			
G	2	Private Citizen		Just like in other regions of the country (and world), property values will take a loss; sometimes severe. Families already strapped lose much needed equity in order to secure bank loans. School districts will become affected since state subsidies are tied with population. The county tax bases will also be affected by the limit of future growth twofold: Wind turbine placement limits housing/ranch building eligibilities, and moreover let's face it; it's clear if people have a choice they do NOT want to move to a region where there are numerous 500' tall industrial wind turbine generators towering over their family farms.	WAPA's review of socioeconomic impacts (such as property values and tax revenues), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	3.10 and 4.10 of the EA 4.10 and 5.10 of the PEIS	Economics
G	3	Private Citizen		Another ill effect that often gets overlooked is how detrimental industrial wind parks are to farmers who rely on aerial applicators to apply crop protection products. The SDAA (South Dakota Aviation Association) recommends at least a 1 mile setback between a wind turbine and a property line so they have ample room to tum a loaded airplane. Without aerial applicators, necessary crop protection products cannot be applied and the crop becomes collateral damage. A farmer's business already has enough risks. Not being able to safely and effectively protect his crop because of a multitude of 500' industrial wind towers shouldn't be one of those. The life of an Ag Pilot already has enough risks. Industrial wind parks compound the risks.	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for establishing minimum setbacks. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. The Project's aboveground collection and transmission lines are expected to be similar to existing distribution lines (located along the edges of fields and roadways), and the turbines and meteorological tower(s) themselves would be visible from a distance and lighted and marked according to FAA guidelines. The Project would comply with FAA safety requirements.	No section.	Land Use
G	4	Private Citizen		There is a plethora of information available regarding negative health effects of industrial wind turbine structures erected too close to residences/communities. Ill effects including noise pollution/infrasound, sleep disturbance, and shadow flicker. 89 testimonies alone from Brown County, WI provide ample proof why the Brown County Board of Health designated the Shirley Wind Farm a "Human Health Hazard". Studies by Dr. Alex Salt, Jerry Punch, PhD, and Richard James, INCE, BME all provide supportive evidence of the ill effects. The Minnesota Dept. of Health's award-winning White Paper Public Health Impacts of Wind Turbines concluded people (who live in and around industrial wind parks) suffering from sleep deprivation, migraine headache, vertigo and tinnitus are most likely a result of low frequency noise (infrasound) created by large wind turbines. Furthermore, the health of some Minnesotans is being harmed by wind turbines.	WAPA's review of human health impacts (such as shadow flicker, infrasound), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	Appendix M, 3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
G	5	Private Citizen		"The subsidy of Big Wind hasn't come cheap: In just eight years -- from 2008 to 2015 -- the credit cost taxpayers $9.6 billion, more than a billion dollars a year. And it gets worse: The credit is expected to cost taxpayers more than $23 billion over just five years from 2016 to 2020, according to the Congressional Research Service. It also hasn't done much for most Americans. Despite the billions that Congress has provided in subsidies, wind energy still produces only 6 percent of our country's electricity. Wind blows only 35 percent of the time -- and its schedule is not exactly pegged to our demand-- so until there's some way to store large amounts of wind power, a utility still needs to operate nuclear, gas, or coal plants to cover when the wind doesn't blow." - Op-ed by Tennessee Senator Lamar Alexander: End the Wind Production Tax Credit" 22 Nov 2017	The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	General

G	6	Private Citizen		Wind energy is far from green energy. Wind turbine technology is an expensive, obsolete, unreliable, intermittent source of energy and should be considered no more than a byproduct of massive subsidies. Billionaire mogul Warren Buffet said it best: " .... on wind energy, we get a tax credit if we build a lot of wind farms. That's the only reason to build them. They don't make sense without the tax credit."	The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	General
H	1	Private Citizen		I am in favor of Prevailing Wind Park. I own land in the footprint area. I am in favor of growth and technology. The wind farm will benefit our town, state, and county. On my property I have a lease site for a cell tower, easement for B-Y Water, telephone, fiber optic, and power lines with very little impact on crop production. I thank WAPA for the survey and serving our area.	Comment noted.	No section.	General
I	1	Private Citizen	12/13/2017	We are for the wind towers. Hope to get several.	Comment noted.	No section.	General
J	1	Private Citizen	12/1/2017	It has come to our attention that you are asking for public comment on wind farms, since we live near a proposed wind farm project [Prevailing Winds] I felt we need to respond. My husband and I have seen many changes in our life some for the good and many others that should never have happened. We feel that wind farms are one of those that should have never came to light. We have been told before of how many things are good for the environment only to find out that it is not so. We are finding out more and more about how they are having a negative effect on people's health, the wildlife even down to the insects that inhabit our soil.	Comment noted.	No section.	General
J	2	Private Citizen	12/1/2017	We have also been told a lot of these farms are owned by foreign corporations. When are we going to stop letting other countries take away from the USA, it's time to make America great again not foreign corporations.	Comment noted.	No section.	General
J	3	Private Citizen	12/1/2017	Electricity came to our rural areas to help people to improve their way of life, now we are told that these wind farms will help our electric rates only to find out this is not so but may even double or triple our rates. This will really make it hard on many of us who live on fixed incomes. This is not helping to improve our lives but sending us backwards.	Comment noted.	3.10 and 4.10 of the EA. 4.10 and 5.10 of the PEIS	Economics
J	4	Private Citizen	12/1/2017	What I have taken from all this about wind farms it is just another snake in the wood pile, looks good on the outside but when you get into it the snake appears and strikes. All I see coming from this is split communities, churches and even down to friends and neighbors. We feel there are better options then wind farms that are less costly or destructive.	Comment noted.	No section.	General
K	1	Cheyenne & Arapaho Tribes THPO	12/11/2017	On behalf of the Tribal Historic Preservation Office of the Cheyenne and Arapaho Tribes, thank you for the notice of the referenced project. I have reviewed your Consultation request under Section I 06 of the National Historic Preservation Act regarding the project proposal and comment as follows: At this time, it is determined to be categorized as No Properties; however, if at any time during the project implementation inadvertent discoveries are made that reflect evidence of traditional cultural properties (TCP) such as: ceremonial or celebration objects, stone rings, villages, burial mounds, battlefield artifacts, or human remains please cease work immediately, in area of discovery and notify the Cheyenne Arapaho THPO Office within 72 hours.	If any inadvertent discoveries are made during project implementation, work will cease in the area of discovery and the THPO will be contacted within 72 hours.	3.8, 3.9, 4.8, and 4.9 of the EA	Cultural

K	2	Cheyenne & Arapaho Tribes THPO	12/11/2017	In addition, if inadvertent discoveries are made; pursuant to Title 36 Code of Federal Regulation Part 800.13, as amended; you will also be required to make arrangements for a professional archaeologist to visit the site of discovery and assess the potential significance of any artifacts or features that were unearth. If human remains are discovered State and Tribal NAGPRA representatives will be contacted and protocols will be executed.	If any inadvertent discoveries are made during project implementation, work will cease in the area of discovery and the THPO will be contacted within 72 hours.	3.8, 3.9, 4.8, and 4.9 of the EA	Cultural
L	1	Private Citizen	1/23/2017	To Prevailing Winds LLC, persons listed, other associated persons, and in general to whom it concerns, and regarding all and any proposed projects, or any general issue. I am the lawful owner of property in Bon Homme County, South Dakota. I hereby give notice that I do not grant access rights, nor lease rights, nor any rights, nor any claims to my land located in Bon Homme County South Dakota or any other lands that I own in any state in the United States of America. This includes but is not limited to equipment, turbines, and transmission lines for the proposed project Prevailing Wind Park wind energy facility proposed by Prevailing Winds LLC. Any access, encroachment, entry, or physical change to my land is explicitly forbidden. Any access and/or trespass and/or action that results in damage to either my property or the crops and/or property of lease(s) will result in potential legal action against violators of the law.	Comment noted.	No section.	General
M	1	Private Citizen	12/13/2017	We would take tower on our ground that is signed up in Bon Homme Co. We are totally in favor of the project.	Comment noted.	No section.	General
N	1	Private Citizen	11/27/2017	We own farm land in Charles Mix County that is within the proposed boundaries and land in Douglas County that may be impacted by this wind turbine project. In August of 2016 we submitted our concerns for a proposed project by Prevailing Winds, LLC to the South Dakota Public Utilities Commission in the same location within Charles Mix and Douglas Counties. A meeting was held for those concerns at a public meeting on August 24, 2016 in Avon, South Dakota. We have been unable to locate the meeting minutes of this public meeting to see if any of our concerns then were addressed. We did find that Prevailing Winds received approval to withdrawal its application for this earlier proposed project, excerpts from Commission meeting on September 13, 2016 shown below.	The South Dakota Public Utilities Commission (SD PUC) operates separately from the WAPA environmental process. Any permissions or approvals from the SD PUC are outside the scope of WAPA's authority. Information, including meeting minutes, regarding the Prevailing Winds Project (Docket EL16-022) can be found on the SD PUC website, located here: https://puc.sd.gov/Dockets/Electric/2016/el16-022.aspx	No section.	General
N	2	Private Citizen	11/27/2017	We still have concerns what the impact will be on our farm land: • land valuation	A number of studies have assessed the potential impacts of wind projects on property values due to deterioration in aesthetic quality, increases in noise, real or perceived health effects, and traffic congestion. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	4.10 and 5.10.1.3 of the PEIS	Economics
N	3	Private Citizen	11/27/2017	• offset distance from turbines to residents	Establishing minimum setback distances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	No section.	Land Use
N	4	Private Citizen	11/27/2017	• Location of turbines on properties that impacts how much of crop producing land is used for constructing turbines, egress roads.	The location of turbines on private property is negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	Land Use
N	5	Private Citizen	11/27/2017	• Noise pollution to nearby residents	Comment noted.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise

N	6	Private Citizen	11/27/2017	• Shadowing effects from turbines to nearby residents	Comment noted	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual
N	7	Private Citizen	11/27/2017	• Liability issues to land damage during construction and turbine operation	Land use leases, including payments for property damage, are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	General
N	8	Private Citizen	11/27/2017	• Land easements terms (30 or 50 years)	Land use leases, including the term of the agreements, are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	General
N	9	Private Citizen	11/27/2017	• Damage to land when turbines are removed by lessee	Land use leases, including payments for property damage, are negotiated between the Developer and the landowner and are outside of WAPA's authority.	3.5 of the PEIS	Decommissioning
N	10	Private Citizen	11/27/2017	• Why power is being sold to other states and not being used locally	Power generated by the project will be sold to customers, as described in the Project's power purchase agreement (PPA). A PPA is a contract between two parties, one which generates the power (Prevailing Winds) and one which purchases the power (the customer). WAPA does not enter into PPAs, nor does WAPA assist developers in finding a customer.	No section.	Economics
N	11	Private Citizen	11/27/2017	We are confident that these and other concerns will be addressed at the December 13, 2017 meeting and that meeting minutes will be available to the public.	The December 13, 2017 meeting was open house format, so no official meeting minutes were taken. All materials that were presented during the public meeting are available on WAPA's website, located at: https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWinds.aspx	No section.	General
N	12	Private Citizen	11/27/2017	It is interesting that the proposed project area for 2017 is similar to the one in 2016. It is also noted that in 2016 area also included an alternate expansion of the wind park. Is there such an alternate expansion in this project? We have been unable to determine this from reviewing your web site and the Prevailing Winds, LLC web site.	WAPA is unaware of any planned expansions of the Prevailing Winds Project.	No section.	General
N	13	Private Citizen	11/27/2017	It is also interesting reading about the impacts on land and communities of other wind park projects and how those counties are amending ordinances to address future projects.	Comment noted.	No section.	General
N	14	Private Citizen	11/27/2017	We are not in favor of Prevailing Winds, LLC locating wind turbines on our land within this proposed project and are not in favor of wind turbines being located adjacent to our property in Charles Mix or Douglas County.	Comment noted.	No section.	General
O	1	Federal Emergency Management Agency	11/29/2017	Currently FEMA has not identified a Special Flood Hazard Area for Bon Homme County. However, we highly recommend you take into consideration any locally known flooding sources and drainage issues during the design and construction of the proposed project. Floods are the most devastating of all natural disasters in this country and any efforts to reduce the impacts are worthwhile. We also recommend you contact Mr. Ron Gall, Charles Mix County Emergency Manager, 29048 382nd Avenue, Lake Andes, South Dakota (605) 487-7845 and Mr. David Hoffman, Hutchinson County Emergency Manager, P.O. Box 715, Parkston, South Dakota (605) 770-7927; for further guidelines regarding Floodplain management in these counties	The nearest mapped floodplains are along Choteau Creek, over 1 mile southwest of the Project Area. A small floodplain in Yankton County associated with Prairie Creek is located adjacent to the transmission line ROW (Figure 3-3). The Developer contacted the county emergency managers on 3/15/2019.	4.1, 4.2, 4.3, 5.1, 5.2, 5.3 of the PEIS 3.2 and 3.3 of the EA	Water Resources
P	1	Private Citizen	12/12/2017	Wind turbines are bad for the environment; they ruin the landscape, dry out fields, drive earthworms out of crop fields and take away the beauty of our rural neighborhoods.	Comment noted.	Chapters 3 and 4 of the EA; Chapters 3, 4, and 5 of the PEIS	Land Cover Wildlife Visual

P	2	Private Citizen	12/12/2017	Wind turbines have serious negative health aspects including hearing problems, sleeping problems, constant agitation and anxiety.	WAPA's review of human health impacts, as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	Appendix M, 3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS.	Human Health
P	3	Private Citizen	12/12/2017	Wind turbines are bad for wildlife. Reports on the we-care website show that pheasants, turkeys and deer will flee from the area. Even frogs and crickets disappear. Migratory birds are slaughtered if they fly through a turning wind turbine.	Comment noted.	3.6 and 4.6 of the EA.	Wildlife
P	4	Private Citizen	12/12/2017	Wind turbines are built on a false premise that all the effects are positive including tax revenue, lower electricity rates, cleaner form of energy, when in fact the agenda to build wind turbines is based on 1 major thing: Production tax credits. In essence, our tax money funds the production tax credit which makes the building of wind towers financially feasible. It is a transfer of wealth from middle class tax payers to rich investors and large corporations, including foreign corporations.	The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	Economics
P	5	Private Citizen	12/12/2017	A big share of the wind farms in the United States are owned by large foreign corporations, including Spain, Ireland, India, Germany, China and others. When the so called local group that started the project sells out, the farmer/landowner has had his easements transferred to a foreign entity with no recourse.	Comment noted.	No section.	General
P	6	Private Citizen	12/12/2017	Wind turbines decrease property values, including not only homes, but bare land. Nobody wants to live in the middle of an amusement park. While politicians talk about keeping the younger generation on the farm, who is going to live in the neighborhood of wind towers in the next generation?	A number of studies have assessed the potential impacts of wind projects on property values due to deterioration in aesthetic quality, increases in noise, real or perceived health effects, and traffic congestion. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	4.10 and 5.10.1.3 of the PEIS	Socioeconomics
P	7	Private Citizen	12/12/2017	Wind turbines will not decrease electric rates. Any statistics the developers show to the contrary are based on the taxpayers pouring in money to make these wind turbines look good.	Comment noted.	No section.	General
P	8	Private Citizen	12/12/2017	The root agenda behind wind turbines is so the environmentalists can continue putting restrictions on coal, making it so expensive that eventually wind energy will be feasible. In the meantime our electric bills are likely to double and triple.	Comment noted.	No section.	General
P	9	Private Citizen	12/12/2017	Wind turbines split communities. They make enemies out of friends. They split towns and churches.	Comment noted.	No section.	General
Q1	1	Private Citizen	11/29/2017	This letter is in response to your letter of November 20 asking for input on the Prevailing Winds Project in my area. I am absolutely opposed to this project. I have been studying the wind energy scam for nearly 8 years now and have been involved in educating people about it. With the help of my son, we have written a book that describes what the wind energy scam really is. I have included a copy for you to read.	WAPA read the book you provided - thank you for the comment.	No section.	General
Q1	2	Private Citizen	11/29/2017	In that book, Chapters 5 and 6 specifically talk about Prevailing Winds LLC and how they tried to build their project already. In August of 2016 they even had the South Dakota Public Utilities Commission hold a meeting in Avon. There was so much opposition that a week later Prevailing Winds withdrew their own application. Since then all they have done was lie. They told us they would not "split" the community. They already did. They told us that they would not break up the big project into smaller projects, but they did. They broke it up into 13 different LLC's to qualify for PURPA	Comment noted. The South Dakota Public Utilities Commission (SD PUC) operates separately from the WAPA environmental process. Any permissions or approvals from the SD PUC are outside the scope of WAPA's authorities.	No section.	General

				and force utility companies to purchase the electricity. They said they would have more public meetings to better inform the public of their project. Since August of 2016 there have been zero meetings.			
Q1	3	Private Citizen	11/29/2017	They came in and completely hoodwinked the county zoning board and commissioners. They railroaded a setback ordinance through called Article 17, which gave residents only 1000 ft. setback from their homes. They did this with the majority of the people in the footprint against it.	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for ratifying minimum setbacks for various zoning categories.	No section.	Land Use
Q1	4	Private Citizen	11/29/2017	There will be economic decline if another project is built. They want to build this adjacent to the Beethoven Wind Farm. These are the same developers and nearly the same board of directors that are pushing Prevailing Winds. They promised the little town of Tripp, South Dakota all this so called tax money and how it would save their school and town. Their school nearly closed last year, and had to raise land taxes to stay open temporarily. Their grocery store was closed. Tripp is a ghost town. Wind energy did nothing for it. As a matter of fact, people will never ever move into an area where there are hundreds of wind turbines, they will only move away.	Comment noted.	No section.	Economics
Q1	5	Private Citizen	11/29/2017	This project is hard on the environment. Wildlife moves out. Wildlife likes it where it is peaceful and quiet, not noisy with shadow flicker from turbines. infrasound is a huge problem with people's health because of the fluctuation in air pressure. It affects how people sleep. Birds and bats are slaughtered. Bats lungs explode from the changes in air pressure, and in time will greatly affect our ecosystem.	Comment noted.	Appendix M, 3.6, and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife Human Health
Q1	6	Private Citizen	11/29/2017	The biggest problem with a project like this is that they are not even built to produce electricity. As Warren Buffet said: "We get a tax credit if we build a lot of wind farms. That's the ONLY reason to build them." Electricity is just a byproduct. Our politicians like John Thune, Mike Rounds and Kristie Noem all get lobby money from multinational companies like Next Era (who pays no income tax) and Berkshire Hathaway (who got $250 million in tax credits last year).	Comment noted.	No section.	General
Q1	7	Private Citizen	11/29/2017	I encourage you to read the book. Prevailing Winds LLC is a company building this project for one thing and one thing only: MONEY. Money from the production tax credit when they sell it to some multinational corporation, money from the State of South Dakota, money from us, the taxpayers who pay for all of this. Wind energy is a scam that takes money from the middle class taxpayer and sends it to multinational and foreign corporations.	WAPA read the book you provided - thank you for the comment. The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	General
Q1	8	Private Citizen	11/29/2017	There is no desire to have this project built in our area from the residents. The bulk of the land that is signed up is owned by absentee landowners. They will never live here. The Prevailing Winds Board of Directors or any of the investors will never live here. They are going to ruin our quality of life and our peaceful enjoyment of our property for money for them selves.	Comment noted.	No section.	General
Q1	9	Private Citizen	11/29/2017	I am including along a list of "helpful resources". This will help you see what is going on in our country with the opposition against wind energy. The Facebook page "Wind Energy 101" has new articles daily.	Comment noted. WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence.	No section.	General

Q1	10	Private Citizen	11/29/2017	There are a lot of people that need to be educated on this topic. But we are making progress. We have seen several counties recently stand up to BIG WIND: Pierce Co. Nebraska 6 month moratorium Stanton Co. Nebraska voted to deny any wind energy projects in their county Walworth Co. South Dakota 2 mile setbacks Cherry Co. Nebraska 2 mile setbacks, no shadow flicker on any public road Lincoln Co. South Dakota 1/2 mile setbacks Clark Co. South Dakota 3/4mile setbacks Deuel Co. South Dakota 2000 ft. setbacks.	Establishing minimum setback distances or moratoriums on certain developments are outside of WAPA's authorities. Typically, county zoning boards are responsible for ratifying minimum setbacks and establishing zoning requirements.	No section.	General
Q1	11	Private Citizen	11/29/2017	Right now there are 13 counties organized in South Dakota against this scam. The sleeping giant has awakened! We hope your will consider what these projects do to a community and to residents who have to live where they are built. They destroy the good life; the reason we moved or stayed here in the first place.	Comment noted.	No section.	General
Q2	1	Private Citizen	12/10/2017	I hope to visit with your staff on Wednesday night in Tripp, SD concerning the Prevailing Winds LLC proposed project. I want to give you the heads up on what you might experience. Prevailing Winds is good at stacking the deck. They will bring in the investors, their wives, kids, parents, aunts and uncles to promote their project. The people against this project are the good citizens of these 3 counties that will HAVE TO LIVE UNDER THE WIND TURBINES. If you feel it would help you, ask the people you visit with what their interest is in the project. Ask them if they are an investor or have sold a lease/easement. Then ask them where they live. Ask everybody where they live.	Comment noted.	No section.	General
Q2	2	Private Citizen	12/10/2017	The problem we have here in Bon Homme County is the smooth talking developers took over our county officials early on. They forced a 1000 ft. setback from a home on us. The residents had the majority that wanted a longer setback but they voted for the 1000 ft. setback and put on a public meeting that was a sham and should be an embarrassment to anybody. This was 2 years ago. Right now the following counties have organized opposition to short setbacks. Those counties are Walworth, Campbell, Hughes, Hyde, Hand, Bon Homme/Charles Mix, Coddington, Deuel, Sanborn, Davison, Lincoln, Sanborn, Clark, and maybe some of I can't think of this morning. Some of these counties have succeeded in getting setbacks from 1/2 mile to 2 miles. We will not be able to tolerate the 1000 ft. setback. We are totally against this project.	Establishing minimum setback distances are outside of WAPA's authorities. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	No section.	General
R	1	Private Citizen	12/8/2017	We live where we were told by Prevailing Wind that we will be 'surrounded' by wind turbines. We moved out in the country to enjoy country living. We would never have built this new home at this location 5 years ago had we known about the wind towers. Which leads you to the	Comment noted.	4.10 and 5.10.1.3 of the PEIS	Land Use Economics

				obvious, other people would not build in a wind industrial park either. Getting away from concrete, steel and blinking lights are often why people choose to live in the country. I have yet to meet anyone who is informed who has a desire to move into a Wind Industrial Park to live and raise their children.			
R	2	Private Citizen	12/8/2017	We have been in contact with many people who live close to wind turbines, besides what is being complained about and documented in every area where there are wind turbines. Generally they have profound physiological affects, lack of sleep, heart pounding, ear ringing and an overall feeling of anxiety.	Comment noted. WAPA's review of human health impacts, as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	Appendix M, 3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
R	3	Private Citizen	12/8/2017	Outdoorsmen have also told us and it is also documented that wild life prefer living without the infrasound if they are on the ground. Masses of flying birds are killed by the blades.	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
R	4	Private Citizen	12/8/2017	And for what. For the Production Tax Credit. If you are a large enough corporation like Next Era Energy or MidAmerican Energy, you can benefit from them in a huge financial way. Meanwhile the people who live near them 'pay' for it, with diminished land values and quality of life and higher electricity bills. It is terrible way in my opinion to pay less taxes.	The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	General
R	5	Private Citizen	12/8/2017	We have watched in our community and also many other areas in South Dakota and neighbors in Nebraska torn apart because of Wind Energy. Neighbor against neighbor. Most often those signing up are either absentee land owners or will not live under the towers but their neighbors are forced to. Wind Energy has not been a good thing for South Dakota. We are working very hard to inform others of the dangers of wind energy and also the deceit we have witnessed with wind developers. They lie and tell one land owner their neighbor is signed up so they might as well also, and after they do the land owner finds out his neighbor had not signed up. We have witnessed that behavior over and over, plus inflated money promises to school districts and county governments. They seem to be willing to say anything to get their job done. Of course when their job is done here, they go back to their homes, which aren't under 550 foot wind turbines.	Comment noted.	No section.	General
S	1	Private Citizen	12/6/2017	I live in the center of where they want to put wind towers. I could write 20 pages of reasons why wind towers are No Good. But I will only touch on the main ones that everyone knows about. I lived on the family farm that has been in the family forever. I wake up to birds singing, wild turkeys coming out of the shelter belt to walk around my house, We have pheasants and deer, its a wonderful place to live. For years we had friends come up from southern states to hunt. We do not run a hunting lodge, we just made friends through the years and people love the open range of hunting in this part of the state. We have a pasture about 9 miles north of here, there are wind towers up there. We take cow calf pairs up there every year, the cows have always been content up there, sense they started the wind towers, when I go up to check on them, there ears are up and they are always in a alert state, never before, but sense the wind towers started, they are. Really, not kidding, true.......... The guy that lives up there with wind towers around him I know, I stopped at his place about a month or so after the towers started turning, I drove in his yard and there was a steady hum, I got out and him and his son met me, I said is it always like this, Yes, was his	Comment noted. WAPA's review of human health impacts (such as shadow flicker, infrasound), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	Appendix B, Appendix M, 3.5, and 4.5 of the EA. 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Noise Human Health

				answer, when the wind is blowing, and its worst when the air is heavy. I asked him if he could hear it in his house, his answer was yes, I said what about if the tv is on, Yes again. I then asked about the shadow flickering, thats when his kid started shaking his head up and down. But he is signed up with the wind, he can not say anything bad about them, they drag him around everyplace they go to show that here is a guy that is living in towers. Well what is his or anyone choices after they sign that 40 year lease. How many companies make you sign a piece of paper to say that you can never say anything against wind, not your headaches, your sleepless nights, your nervousness that it causes. I can buy a new pickup with a window sticker of 40,000 dollars and if I am not happy with it, I have 30 days to take it back. What kind of a company makes it unbreakable to get out of it if there is health reasons, noise, and all the other bad things that comes with wind.			
S	2	Private Citizen	12/6/2017	It makes your land worth as much as 40 % less if you are even close to wind towers, your wild life will leave, it will kill birds, bats, and the noise you hear is bad, but the noise you do not hear is even worst.	WAPA's review of human health impacts (such as shadow flicker, infrasound), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	Appendix B, 3.6, 3.12, 4.6 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Economics Wildlife Noise
S	3	Private Citizen	12/6/2017	The blinking lights all the time is something else. I can look north and see them that are 9 miles away, blinking all the time every night, but I can also walk to the end of my driveway and look sw into neb and see at least 90 red blinking lights, its hard to believe that I can see those wind tower lights from here, as they have to be more than 60 to 90 miles away. Just think of the poor people that have to live in that. And they are speaking now, but its to late for them. And the ones that signed up, they know it too, but will never be able to speak bad about it.	The Project would adhere to FAA lighting requirements. Lighting for facilities shall not exceed the minimum required for safety and security, and full cutoff designs that minimize upward light scattering (light pollution) shall be selected. If possible, site design shall be accomplished to make security lights nonessential. Where they are necessary, security lights shall be extinguished except when activated by motion detectors (e.g., only around the substation).	4.1, 4.7, 5.6 of the PEIS 3.7 and 4.7 of the EA	Visual
S	4	Private Citizen	12/6/2017	These towers north of me have there office south of me, so they drive by everyday, 3 to 4 new pickups, almost always with one driver, I always wanted to stop them and find out why they don't pickup pool, and all get in one pickup, but then after they first sold the wind towers to some holland company, and they then sold it again to northwestern, who was forced to buy it and pay the millions of dollars so they could all make money, then in the end, northwestern just puts the extra money they need by increasing the bills to the customers. If you are a northwestern customer around here, your rates went up. So they can drive as many pickups as they want to, cause in the end, the northwestern customers will pay for it. And whenever I would check cattle there are always at least 2 to 4 that are not working. They already came out and put new bearings in 8 of them, and they were only a couple of years old. guess who pays that.	Comment noted.	3.1 and 4.1 of the EA. 3.10 of the PEIS.	Transportation

S	5	Private Citizen	12/6/2017	The people that are pushing this lie, and the greed that they have and the investors have is unbelievable, they will do and say anything to get there way. One of the meetings they had in avon had all the investors handing out stickers that say I love wind, caps, whatever they thing will sway people to thinking that they should sign up. At the meeting, all the people that spoke for wind were investors. They were there because they want to make money. All the others that were there and spoke against them did so because they do not want them, for the reasons above and the many more that I did not list. One of the things that bringing wind towers into a farming community or any community is that it splits people, I can see it in town, in our country church, everyplace that is in the area of the towers you have hard feelings. Its making a what was a friendly community into a hateful community. All in the name of money. The wind people don't even hold meetings around here anymore, they know that people Don't want them, so now they moved up north to have there secret meeting to the people that are uneducated on what wind is really about. I am guessing that is why they are having that meeting that is coming up in tripp. I have heard that two of the things that God hates the most is lieing and greed, if I had to say two words that define wind companies, those are it. I know that there are people that signed up without knowing the facts about wind towers, they were just lead into thinking that they were going to get easy money. Some of them are starting to realize what a mistake they made. No one wants to live in a wind farm, and if you check out the investors you will find that none of them live in the area where they want to put them. The wind companies seem to have a way of buying the people they need to move there plan ahead, they care about nothing but money. If anyone stops them, they will try to go around and do it some other way. After seeing all the things they have done to get there way, evil, is to good of a word for them.	Comment noted.	No section.	General
S	6	Private Citizen	12/6/2017	So my opinion on wind towers is clear, WE DO NOT WANT THEM, THEY ARE NO GOOD, THEY HURT THE HEALTH OF PEOPLE, THEY TAKE AWAY WILDLIFE, THEY SPLIT COMMUNITIES, THEY MAKE YOUR LAND WORTH LESS, AND THEY DON'T OR NEVER WILL PAY FOR THEM SELVES. THEY ARE ONLY PUT UP FOR THE TAX CREDITS, AND THE INVESTORS TO MAKE MONEY, THAT IN THE END, THE TAX PAYERS WILL PAY FOR. AND NO ONE WANTS TO LIVE IN A WIND FARM, NO ONE..............................	Comment noted.	Chapters 3 and 4 of the EA; Chapters 3, 4, and 5 of the PEIS	General
T	1	Private Citizen	12/2/2017	I've lived here on farm for 67 years: it's a county farm, I like the country living. So peaceful, love the wildlife ect. Then the wind lease came in 10-12 mi north of me, evenings looked like Las Vegas strip, all those blinking lights ect. They are ruining our state. It's all about money and the sad thing about wind towers is how it is splitting up neighbors, towns, churches. Most of the people that want them didn't live anywhere around them. I have found that they are so secret (can't let anyone know what we offered you). You can have them put wherever you want!! Another lie. What are we going to have for our grandchildren and great grandchildren? Tons & tons of cement and lots of material. Who will take them down etc.? What I have noticed is that many of the turbines aren't turning. My trip to Minn a while back went past so many turbines not turning, don't need them?!! So much for wind towers.	Comment noted.	No section.	General

T	2	Private Citizen	12/2/2017	I don't like what they are doing, destroying the birds, chasing away the deer, turkeys, etc.	Comment noted.	3.6 and 4.6 of the EA	Wildlife
T	3	Private Citizen	12/2/2017	And yes they are noisy.	Comment noted.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise
U	1	Private Citizen	12/13/2017	Please consider this a letter of strong support for the Prevailing Wind Park Project. After attending the public scoping meeting and open house Dec 13, 2017 at the Tripp, South Dakota Legion Hall, I am even more convinced that this is a good project. The location zoning, environmental, safety & economics. All factors have proven that this project should be completed. I have seen many proposed wind projects, some have been very good and some did not make it past the drawing board. This project will be a great economic boom to our area & will provide safe clean electric energy for many years. This is a good project & I strongly support all aspects of it.	Comment noted.	No section.	General
V	1	Private Citizen	12/10/2017	This letter is to protest the proposal of another 47,000 acre industrial wind park for parts of Bon Homme, Hutchinson and Charles Mix Counties, South Dakota. We border Charles Mix County living in Gregory County. With many grandchildren living in the near vicinity, we know this is not a good thing to have this close or anywhere at all. According to records, this is a money scam raping us tax payers of our hard earned money! A big inventory - Warren Buffet has been quote to say in 2014 "...we get a tax credit if we build a lot of wind farms. That's the only reason to build a lot of wind farms. That's the only reason to build them." That statement says it ALL!! This letter of opposition to this hostile takeover of our land and homes comes from local land owners that hope to pass our land down to our child and grandchildren. Help keep our land free of this scam!	Comment noted. The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	General
W	1	Private Citizen	12/13/2017	I am a landowner that will be affected by the Prevailing Winds Wind Farm. Will the meeting in Tripp tonight be recorded or broadcast over the internet? I live near Bellingham, WA and probably won't be there. Pretty sure I won't be there. I will be sending you my comments in the near future but am very interested in the meeting tonight. Thank you.	The December 23, 2017 public scoping meeting was not recorded or broadcast over the internet. Materials presented during the open house are posted on WAPA's webpage, available at: https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWinds.aspx	No section.	General
X	1	Private Citizen	11/22/2017	I am married to a landowner that has agreed to have this valuable alternative to fossil fuels established on her land. I just want to thank you for your patience and for bringing the alternative of wind power to the state of South Dakota. Not only are you not putting 100 Ks of gallons of toxic tar oil in the ground but you are actually allowing the people of South Dakota (by making us a provider of energy) to get back a share of the wealth that has gone out of state so that they could have minimal power supplies in place. New technologies such as solar and solid state batteries along with electric vehicles-all sorts of vehicles- will further propel the changes that will brighten the futures and make the people of South Dakota less dependent on outside wealth to provide the sources of energy that will be needed.	Comment noted.	No section.	General
Y	1	Private Citizen	12/11/2017	I oppose this wind farm.	Comment noted.	No section.	General

Z	1	Private Citizen	12/19/2017	Saw this public notice in the Tripp Star Ledger. I am a land owner in the area of the proposed project. Since I am stationed and located in the Denver area, I was not able to attend the informational meeting. Can you direct me to an info sharing area or website that WAPA may have established for this project? If none, can you please forward any document(s) that describe the project and provide basic information (summary in nature would be great)? I would greatly appreciate your assistance.	WAPA provided the following response on 12/20/17: Thank you for your interest in the project. The attached letter and map were mailed to all landowners within and adjacent to the proposed project area. WAPA also has a website dedicated to the project, located at: https://www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWinds.aspx.	No section.	General
AA	1	Private Citizen	11/25/2017	We are totally supportive of the Prevailing Winds project and Renewable Energy, both wing and solar. We strongly urge WAPA to give this new project their full support and approve it's development and construction. Thanks you for allowing us to voice our support of Prevailing Winds.	Comment noted.	No section.	General
AB	1	Private Citizen	11/25/2017	We are totally supportive of the Prevailing Winds project and Renewable Energy, both wing and solar. We strongly urge WAPA to give this new project their full support and approve it's development and construction. Thanks you for allowing us to voice our support of Prevailing Winds.	Comment noted.	No section.	General
AC	1	Private Citizen	12/11/2017	I own land that lies in the footprint of the proposed above mentioned project. It is the most valuable and cherished asset that I own. I've invested a lot of hard work and sweat into this land alongside my parents and frequently dwell on the many memories I have from those experiences. I often think about the nights on the homestead when it was so quiet that you could hear the sounds of cattle rustling in the feed yard, coyotes in the distance, and the wind blowing softly through the trees. It was quiet tranquility and free therapy. I travel back to my land every year and look forward to physically standing on the ground that I grew up on and revisiting these memories. This experience and unique open prairie landscape would disappear forever if this huge wind farm project would be built as proposed. I keep up with the local rhetoric from the wind farm developers and marvel at how they continue to manipulate their agenda to deceive the residents, owners, and local governing boards for just one thing, and that is "MONEY". In August, 2016, at a formal town hall meeting in Avon, the local people already resoundingly spoke and rejected a similar wind farm proposal.	Comment noted.	No section.	General
AC	2	Private Citizen	12/11/2017	Since that meeting, much more solid historical evidence on operating wind farms has become available for discussion and analysis. Evidence has shown the environmental and health risks involved with wind farms are real.	Comment noted. WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding impacts to the environment and human health.	No section.	General

AC	3	Private Citizen	12/11/2017	In addition, as more historical economic and operating data is becoming available, the argument against wind farms has grown even stronger. Wind farms can only exist because of heavy government subsidies (our tax dollars). Land values do erode. The landowner is tied into a ridiculous long-term contract that cannot be broken. Wind farm ownership eventually is with a foreign conglomerate and then forced on a local utility who has to impose higher utility rates to accommodate. The promise of a large local economic impact with many additional jobs and tax revenue is purely propaganda and has yet to materialize as evidenced from the existing wind farm that has been operating for several years near Tripp, SD.	Comment noted. The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA. WAPA's review of socioeconomic impacts (such as property values and tax revenues), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds. Land use leases and terms are negotiated between the Developer and the landowner and are outside of WAPA's authority.	Chapters 3 and 4 of the EA; Chapters 3, 4, and 5 of the PEIS	Economics
AC	4	Private Citizen	12/11/2017	I could not live with myself if I subjected the people living near my land to be burdened with the sight and sounds of wind turbines. Greed and money from supporting wind farms will never compromise my integrity. Please help save any further taxpayer time and money from being spent on this proposal, by respectfully honoring and accepting the people's overwhelming voice of opposition to any additional wind farms being built in these counties. Why not instead, change your focus, and pursue the possibility of building these inefficient and unsightly wind turbines on public land and help stop the wind farm proponents from continually trying to invade and encumber our private land?	The Project is being proposed by a private entity, on private property. WAPA's role in the Project is limited to the interconnection request. If there is available transmission capacity on the federal transmission system, WAPA provides open access to transmission services so that energy producers can transmit power to their customers. Any entity requesting transmission services must submit an application to WAPA for interconnection. For more information about the interconnection process, visit WAPA's website at: https://www.wapa.gov/transmission/interconnection/Pages/process.aspx. The federal interconnection process is separate from any State, County, or local permitting and approvals that may be required.	No section.	General
AD	1	Private Citizen	12/12/2017	Thank you for informing me of the proposed Prevailing Winds, LLC Wind Turbine project and the upcoming scoping period and public meeting. I wish to be informed of all updates regarding this project and I would appreciate seeing a more detailed prospectus of the proposal, including a more detailed map of the Project Area under consideration.	WAPA provided the following response on 12/18/17: You have been added to WAPA's distribution list for updates to the proposed Prevailing Winds Project and no additional application is necessary.	No section.	General
AD	2	Private Citizen	12/12/2017	You must be aware that this same company applied to the South Dakota Public Utilities Commission in 2016 for a permit for this project. In August 2016 there was a very well attended public hearing (300-500 people) during which the majority raised extremely well thought out opposition to the project. The people in support of the project were all investors in Prevailing Winds. The PUC had both a court stenographer and a videographer recording the entire proceeding. Your agency should review the entire four hour meeting to hear the studied, scientific, thoughtful, passionate, and emotional speeches made in opposition to the Wind Turbines. We were each allowed only 10 minutes, which I found insufficient to relate the extent of my opposition.	WAPA is aware of the Project's application through the South Dakota Public Utilities Commission (SD PUC). The SD PUC operates separately from the WAPA environmental process. Any permissions or approvals from the SD PUC are outside the scope of WAPA's authorities.	No section.	General
AD	3	Private Citizen	12/12/2017	I would like to know why Prevailing Winds is now making application for this project through your Federal Agency, when they were unsuccessful with the local community and with SD Public Utilities. The Beethoven Wind Farm(B&H Wind, same developers as Prevailing Winds), north of Bon Homme County, was built without public approval or notifications or hearings because of loopholes in the South Dakota Public Utilities Energy Facilities Application Code relating to the number and MW of turbines. The Beethoven Project was sold to a subsidiary of German conglomerate BayWa before construction. B&H and BayWa benefited from the Production Tax Credit and the construction of the project before selling it to Northwestern Energy, who was required to buy the power generated, who in turn requested a rate hike which was settled at $20 million annually. The local population didn't need additional power, in fact, some farms don't use any power(you can tour the near-by efficient Hydro-	WAPA's role in the Project is limited to the interconnection request. If there is available transmission capacity on the federal transmission system, WAPA provides open access to transmission services so that energy producers can transmit power to their customers. Any entity requesting transmission services must submit an application to WAPA for interconnection. For more information about the interconnection process, visit WAPA's website at: https://www.wapa.gov/transmission/interconnection/Pages/process.aspx. The federal interconnection process is separate from any State, County, or local permitting and approvals that may be required. The proposed interconnection of the Project to WAPA's transmission system is a Federal action under NEPA. As a result, an Environmental Assessment (EA) will be prepared to evaluate the environmental effects of the Project. The EA will tier from the analysis conducted in the Upper Great Plains (UGP)	No section.	General

				Electric Plant at Fort Randall Dam, which generates 320 MW). Now the local population has a big rate hike to benefit the developers and the German conglomerate.	Wind Energy Final Programmatic Environmental Impact Statement (PEIS). The PEIS can be viewed online. Together, the EA and the PEIS will comprise the NEPA documentation for this proposed Federal action. If WAPA finds there are no significant environmental impacts, the interconnection request will be granted and WAPA will prepare a Finding of No Significant Impact. If significant impacts are identified, the Environmental Impact Statement (EIS) process would be initiated. An EIS provides a more thorough evaluation of impacts and alternatives, as well as a more formal public involvement process. The Beethoven Wind Farm did not propose to interconnect to WAPA's transmission system, and thus, there was no Federal action under NEPA. As a result, WAPA did not prepare an EA or any other environmental evaluation document.		
AD	4	Private Citizen	12/12/2017	I am sincerely concerned by the prospect that Prevailing Winds access to financing and influence which will override the concerns of the farmers, landowners, and residents in the area of this project, especially now that they are seeking approval from the more powerful federal agency.	WAPA's role in the Project is limited to the interconnection request. If there is available transmission capacity on the federal transmission system, WAPA provides open access to transmission services so that energy producers can transmit power to their customers. Any entity requesting transmission services must submit an application to WAPA for interconnection. For more information about the interconnection process, visit WAPA's website at: https://www.wapa.gov/transmission/interconnection/Pages/process.aspx. The federal interconnection process is separate from any State, County, or local permitting and approvals that may be required.	No section.	General
AD	5	Private Citizen	12/12/2017	I applied for and was granted 'Party Status' before the SD PUC. Please advise me if there is any similar application necessary to keep informed of developments on the Prevailing Winds issue.	WAPA provided the following response on 12/18/17: To be clear, the WAPA process is separate from the SD PUC permit and approval process. If you wish to stay involved in the SD PUC process, please contact the PUC. WAPA will periodically update a Project webpage as more detailed information becomes available. The webpage can be found at: www.wapa.gov/regions/UGP/Environment/Pages/PrevailingWinds.aspx.	No section.	General
AD	6	Private Citizen	12/12/2017	My brother and I own a farm of about 700 acres in Bon Homme County, which has been in our family for over 135 years. Our tenant farmer, who lives in Tripp, has farmed the property for 40 years. We also have relatives who farm nearby. Our farm is in the Prevailing Winds footprint as shown.	Comment noted.	No section.	General
AD	7	Private Citizen	12/12/2017	My concerns include but are not limited to: 1) Health, Environment, and Conservation Issues---i.e. Light Flicker, Sound Issues, Infrasound, Sleep Issues , Bird Kill , and Effects of Proximity to High-Power Transmission Lines	Comment noted.	Appendix M, Chapters 3 and 4 of the EA Chapters 3, 4, and 5 of the PEIS	Visual Noise Human Health Wildlife
AD	8	Private Citizen	12/12/2017	2) Permanent Destruction of the Landscape	Comment noted.	Chapters 3 and 4 of the EA; Chapters 3, 4, and 5 of the PEIS	Land Use Land Cover
AD	9	Private Citizen	12/12/2017	3) Unknown Industrial Contamination Liability	Comment noted.	3.8, 3.9, 5.12, and 5.13 of the PEIS	Hazardous Materials
AD	10	Private Citizen	12/12/2017	4) Permanent Degradation and Contamination of Site. Massive concrete foundation largely to remain in ground at decommission--- construction, deconstruction of site includes BLASTING, etc. of site- no controls on dumping of debris & toxins on farmland.	Comment noted.	3.5, 3.8, 3.9, 5.12, and 5.13 of the PEIS	Hazardous Materials Land Use

							Land Cover Decommissioning
AD	11	Private Citizen	12/12/2017	5) Unknown Real Estate Tax Liability, i.e. Turbine Assessment	WAPA's review of socioeconomic impacts (such as property values and tax revenues), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	3.10 and 4.10 of the EA 4.10 and 5.10 of the PEIS	Economics
AD	12	Private Citizen	12/12/2017	6) Destruction of local roads for construction without compensation to community	Requiring escrow accounts is outside WAPA's authority. The developer filed an escrow agreement as part of the SDPUC process in February 2019 (available at https://puc.sd.gov/commission/orders/electric/2019/el18-026liaison.pdf). In addition, the Developer has entered into Road Use Agreements with the counties and townships in the Project area.	5.1.2 of PEIS 4.10 of the EA	Economics
AD	13	Private Citizen	12/12/2017	I unequivocally oppose the Prevailing Winds Turbine Project. I do not see any benefit from the project to anyone but the developers.	Comment noted.	No section.	General
AE	1	Private Citizen	12/6/2017	I grew up on a farm north of Avon, SD in Bon Homme County, but now live in Texas. My parents worked very hard over their lifetime to attain the land that I now own in Bon Homme and Charles Mix County. Their intent was for this land to be passed down to future generations, and would be dismayed that investors want to build wind turbines in the area.	Comment noted.	No section.	General
AE	2	Private Citizen	12/6/2017	I am concerned that allowing wind turbines to be constructed in this area would greatly diminish the land values, damage the wildlife, cause health issues to the people who live there, and change the area's beautiful South Dakota landscape forever.	A number of studies have assessed the potential impacts of wind projects on property values due to deterioration in aesthetic quality, increases in noise, real or perceived health effects, and traffic congestion. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	3.6 and 4.6 of the EA. 4.6, 4.10, 5.6, and 5.10.1.3 of the PEIS	Economics Wildlife Human Health
AE	3	Private Citizen	12/6/2017	I don't believe that wind turbines will benefit anyone. The towers are massive and the cost is so enormous that they will never produce enough power to sustain the cost of the tower. Electricity rates go up where towers are built because power companies are forced to purchase the wind farms. The wind farm projects typically are sold and resold and often are bought by foreign corporations. The only people who benefit from building the turbines are the investors, and the only reason they invest is because of the production tax credit that the federal government provides. In my opinion, building wind farms is a complete sham and a shame that these investors try to cram them down the throats of landowners and residents. No one wants to live anywhere near a monstrous wind tower and they certainly will not want to live in an area where there are 100 of them.	Comment noted. The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	General

AF	1	Private Citizen	11/28/2017	I thank you for this opportunity to comment as you offered in the letter I received recently from you. I am currently a resident of Norfolk, Nebraska, and a landowner in Bon Homme County, South Dakota. My son lives on this property today, and my family has occupied this land for nearly 100 years. I also plan to retire to this area and specifically, this property, in the next 4 years. Fundamentally I am quite favorable to wind energy as it is a very clean source of energy. There is no continuous carbon footprint from consumption of coal or natural gas and there is no water demand for steam or cooling as other sources of energy require other than wind or solar. I would welcome the installation of several towers on my property if the facility reached to my property. I have researched this with several landowners who have these towers already North of this proposed project and also those who have had these towers for years North of Bloomfield, NE.	Comment noted.	No section.	General
AF	2	Private Citizen	11/28/2017	Frankly there were really no complaints about low sonic noise or shadow flicker. There were a few comments about the red lights used to alert local aviation but that was more or less the gist of negatives.	Comment noted.	No section.	Visual Noise
AF	3	Private Citizen	11/28/2017	Please add my positive agreement to this project. I appreciate the offer to attend the December 13th meeting in Tripp but I will be unavailable during this time. Please don't let a few loud voices of discontent derail the forward progress we need as a society. At one time these same type of people tried to stop the deployment of the automobile in favor of remaining with horses.	Comment noted.	No section.	General
AG	1	Private Citizen	12/11/2017	I am a land owner within the proposed Prevailing Winds project in Bon Homme County, South Dakota. I oppose this project. In the past few years the farmers have had some good crops and we have seen some economic benefit such as homes being built and investing in our smaller communities. If this project is built, that development will decrease as young people will not want to build a home close to a giant 600 ft. wind turbine rotating at 200 miles per hour. While politicians talk about keeping the younger generation on the farm, who of the next generation wants to live in a neighborhood of wind towers.	A number of studies have assessed the potential impacts of wind projects on property values due to deterioration in aesthetic quality, increases in noise, real or perceived health effects, and traffic congestion. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	4.10 and 5.10.1.3 of the PEIS	Economics
AG	2	Private Citizen	12/11/2017	Farming is the livelihood of the area and wind turbines make it impossible for farmers to aerial spray their crops. Some years it gets too wet to spray with a ground unit. Some chemicals need to be applied from the air when the crop is too tall. This would hinder the farmer's normal farming practice and would reduce yields.	The Project will comply with all FAA requirements regarding setbacks, lighting, and other safety requirements.	No section.	General
AG	3	Private Citizen	12/11/2017	Studies also say that wind turbines drive earthworms out of crop fields - earthworms are vital to the land for aeration and breakdown of organic matter…reduced yields and poor soil conditions result in economic decrease.	Comment noted. WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding soil and wildlife impacts.	3.2 and 4.2 of the EA. 4.2 and 4.2 of the PEIS.	Wildlife Soils
AG	4	Private Citizen	12/11/2017	Tourism in our state is a source of large economic revenue. If we continue to liter our landscape with wind turbines, the beauty and peacefulness	Comment noted.	3.10 and 4.10 of the EA. 4.10 and 5.10 of the PEIS	Economics

				that draws people to the prairie will be diminished. Tourism will suffer resulting once again in economic decrease.			
AG	5	Private Citizen	12/11/2017	Hunting also provides large economic revenue for our state. Reports on the we-care website show that pheasants, turkeys and deer will flee from the area where wind turbines exist. Even frogs and crickets disappear. Migratory birds are killed if they fly through a turning wind turbine. Once again – economic decrease.	Comment noted.	3.10 and 4.10 of the EA. 4.10 and 5.10 of the PEIS	Economics Wildlife
AG	6	Private Citizen	12/11/2017	For those communities adjacent to these wind farms, there is very little in the way of positive economic development. The town of Tripp has seen no positive changes since the first project was built 4 years ago. The turbines break down and big cranes carried by 17 semi-trucks come in and fix them. Local people are unable to fix them so there is no job benefit to the community. The cost to repair them is passed on to consumers and not to mention the wear and tear on our county roads …and who pays the county to make road repairs…all of us who live and own property in the county, not the owner of the turbines. There does not seem to be much local benefit from having these turbines in our front yards.	Requiring escrow accounts is outside WAPA's authority. The developer filed an escrow agreement as part of the SDPUC process in February 2019 (available at https://puc.sd.gov/commission/orders/electric/2019/el18-026liaison.pdf). In addition, the Developer has entered into Road Use Agreements with the counties and townships in the Project area.	5.1.2 of PEIS 4.10 of the EA	Economics
AG	7	Private Citizen	12/11/2017	We also do not want to live close to a project like this due to potential health risks associated with it. Studies have shown that infrasound is real. It causes headaches, sleeplessness, vertigo, nausea and a number of other symptoms.	WAPA's review of human health impacts, as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AG	8	Private Citizen	12/11/2017	We choose to live, work and raise our families in South Dakota because we have a great appreciation for our land and our wild life. We work hard and we care about our neighbor. The large corporations, local and foreign, do not care about our land or our way of life, they are only in this for the production tax credit that they can receive – greed and a quick buck. Would you want a big, gaudy wind turbine in your front yard…in your view out your living room window? Please allow us to preserve our property and our "front yard".	Comment noted.	No section.	General
AG	1	Private Citizen	12/4/2017	I am writing in opposition to the proposed 47,000 acre Prevailing Winds Project in south-central South Dakota. Attached is a packet of information I pulled together for my local county commissioners in 2016, during which time Juhl Energy was proposing a similar project in my home county, Sanborn County, SD. There are a LOT of issues with wind farms from a health, safety and environmental perspective. I won't even go into the subsidies issue, without which they would not be financially viable. Please take the time to read the attached information packet. And, if nothing else, please read the bottom line conclusion for each topic, highlighted at the bottom of each page. Thanks.	Comment noted.	No section.	General

AG	2	Private Citizen	12/4/2017	As promised in the county commissioners' meetings of April 5 and April 19, 2016, I have put together a packet of information on the pages that follow addressing the various issues surrounding wind turbines and the proposed project in southern Sanborn County. For each of the topics (e.g., Impact on Real Estate Value), I have tried to obtain data from objective sources, which has proven difficult; thus, the amount of time it has taken me to read through dozens of lengthy articles/reports and summarize them. Unfortunately, there is a lot of misinformation out there and/or propaganda from those either opposed to wind energy or those promoting it. I have taken key excerpts from the various articles/sources, yet still provided either a link to the site and source from which it was taken, or supplied the actual full document as an embedded file. Obviously, this printed file you are reading does not allow access to the embedded files. Therefore, I have also included a memory stick in this mailing, which you can use in your computer to access either the embedded files in their entirety, or you can use to take you directly to the internet sites that I reference throughout. Lastly, at the end of each of the issues addressed, I have attempted to provide the bottom line conclusion(s) from the data ... shown in bold face font. I would ask that you please take the time to analyze this data thoroughly before making any decisions on the subject. Please let me know if you have any questions or comments.	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	No section.	General
AG	3	Private Citizen	12/4/2017	"Wind Turbine Impact Study" by Appraisal Group One, Sept 9, 2009 performed on data from Dodge and Fon du Lac Counties, Wisconsin (389 ft. tall vs nearly 500 ft. proposed in Sanborn County): o Page 5: "In conclusion, it can be observed that: (a) in all cases with a 1-5 acre residential property, whether vacant or improved, there will be a negative impact in property value; (b) with 1-5 acre properties the negative impact in property value in bordering proximity [within 600 feet] ranged from -39% to -43%; (c) with 1-5 acre properties the negative impact in property value in close proximity [within 1000 feet] ranged from -33% to -36%; (d) with 1-5 acre properties the negative impact in property value in near proximity [within one-half mile] ranged from -24% to -29%" o Page 61: "Of the studies that found no impact on property value, nearly all were funded by wind farm developers or renewable energy advocacy groups. Of the studies and reports showing property loss, the average negative effect is -20.7%."	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	4.10 and 5.10.1.3 of the PEIS	Economics
AG	4	Private Citizen	12/4/2017	Clarkson University School of Business, Clarkson, NY, "Values in the Wind: A Hedonic Analysis of Wind Power Facilities" (March 3, 2011), abstract below with full report following: o "This paper uses data on 11,369 property transactions over 9 years in Northern New York to explore the effects of new wind facilities on property values" ... "We find that nearby wind facilities significantly reduce property values. Decreasing the distance to the nearest turbine to 1 mile results in a decline in price of between 7.73% and 14.87%. These	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	4.10 and 5.10.1.3 of the PEIS	Economics

				results indicate that there remains a need to compensate local homeowners/communities for allowing wind development within their borders." o Page 26: "for a given home the nearest turbine ... only 0.5 miles away results in a 10.87%-17. 77% decline in sales price depending on the initial distance to the nearest turbine and the particular specification ... At a distance of 1 mile (about 20% of our sample), we see declines in value of between 7.73% and 14.87%."			
AG	5	Private Citizen	12/4/2017	"The Sunday Times" newspaper, Suffolk, England, UK (July 22, 2012), article "Council tax cut for homes near wind farms" by Jonathan Leake (http://www.thesundavtimes.co. uk/ stop/news/ u k news/Environment/ article 1086138.ece) o The Valuation Office Agency (VOA), which decides council tax valuations, has accepted that having wind turbines built near homes can sharply decrease their value and has, as a result, moved some into a lower tax band ... a couple living near the 22-turbine Fullabrook wind farm near Braunton, Devon saw the price of their home fall from about £400,000 to £300,000. Three of the turbines are within 650 yards of their home.	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	4.10 and 5.10.1.3 of the PEIS	Economics
AG	6	Private Citizen	12/4/2017	Conservative bottom line impact on real estate value: • Within one-half mile = value impairment of from 11% to 18% • Within one mile = value impairment of 8% to 15%	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	4.10 and 5.10.1.3 of the PEIS	Economics
AG	7	Private Citizen	12/4/2017	The Juhl Energy tax information sheet recovered from Letcher's CorTrust Bank on April 4, 2016 contains severe misinformation regarding the tax benefit to schools.	Juhl Energy's tax information is outside the scope of this EA.		Economics
AG	8	Private Citizen	12/4/2017	2016 South Dakota Legislative Session and Annual Meeting, from the South Dakota Wind Energy Association website (http://www.sdwea.org/news.html): Senate Bill 131: The Bill has been signed into law on March 11, 2016. "any wind energy tax revenue apportioned to a school district from a wind farm producing power for the first time after June 30, 2016, one hundred percent shall be retained by the school district to which the tax revenue is apportioned for the first five years of producing power, eighty percent for the sixth year, sixty percent for the seventh year, forty percent for the eighth year, twenty percent for the ninth year, and zero percent thereafter. "	Comment noted.	4.10 and 5.10 of the PEIS	Economics
AG	9	Private Citizen	12/4/2017	The only way for a school district to retain all the wind energy tax revenue as local effort for production after June 30, 2016 is to opt-out of the new funding bill. This has been verified by our local state representatives (Mathew Wollmann on April 18, 2016 and Leslie Heinemann on April 24, 2016), as well as by our State Senator, Scott Parsley (on April 26, 2016).	Comment noted.	No section.	Economics
AG	10	Private Citizen	12/4/2017	Sanborn Central School District will incur $72k/yr. higher teacher salaries as a result of the new teacher pay program enacted this year (per Gayle Bechen, business manager for Sanborn Central School on April 24, 2016). If they were to opt out (which Bechen says they do not have plans to do), they would be funded under the old program ... meaning they'd lose $72k/yr. in funding.	Comment noted.	No section.	Economics

AG	11	Private Citizen	12/4/2017	Juhl Energy claims that the proposed Sanborn County project would have a capacity factor "in the low 40's" even though the actual capacity factors for wind turbines from U.S. Energy Information Administration (a government website) are as follows: 2013 = 32.4%, 2014 = 34.0%, and 2015 = 32.5%; three-year average = 33.0%. https://www.eia.gov/electricity/monthly/epm table grapher.cfm?t=epmt 6 07 b I have assumed 35% for the base case and 42% for the most optimistic case in the Excel file embedded below.	Juhl Energy's project is outside the scope of this EA.	No section.	Economics
AG	12	Private Citizen	12/4/2017	At 35% capacity factor, the 30 year average tax revenue to the School District would be only $7600/yr. Even at a 42% capacity factor, this increases to only $7800/yr.	Comment noted.	No section.	Economics
AG	13	Private Citizen	12/4/2017	The 2016 reimbursement rate from the state to the school district is $4877 /yr./student. This rate will be higher under the new funding formula, so the file below contains a very conservative look at the implications.	Comment noted.	No section.	Economics
AG	14	Private Citizen	12/4/2017	Conservative bottom-line impact and conclusions: • The tax revenue from wind energy generation for Sanborn Central School would only be $7600-7800/yr. (35%-42% capacity factor) average over the 30 year project life (not the ">$1M" over the 30 year life claimed by the proponents of this project) • This is equivalent to only 1.6 students over the 30 year period (meaning if one family moves away and doesn't have their children educated in Sanborn Central School, the tax benefits from wind energy to the School District are more than offset)	Comment noted.	No section.	Economics
AG	15	Private Citizen	12/4/2017	South Dakota Game Fish and Parks ("Siting Guidelines for Wind Power Projects in South Dakota", PDF embedded below) o Page 5: "Avoid large, intact areas of native vegetation. Sites where native vegetation is scarce or absent will have substantially fewer biological resource concerns" (the proposed southern Sanborn County project is in the midst of CRP)	The Project has been sited to avoid large, intact areas of native vegetation whenever possible.	3.1, 3.6, 4.1, and 4.6 of the EA.	Wildlife
AG	16	Private Citizen	12/4/2017	"Wind Turbine Impact Study" by Appraisal Group One, Sept 9, 2009 performed on data from Dodge and Fon du Lac Counties, Wisconsin (389 ft. tall wind turbines), with full report in Section #1: o Page 44: "Many people living near operating wind turbines are reporting neurological and physiological disorders that are only resolved when the turbines are off or when the people leave the area. Common symptoms include sleeplessness, headaches, dizziness, unsteadiness and nausea, exhaustion, anxiety, anger, irritability and depression, problems concentrating and learning, and Tinnitus (ringing in the ears). Symptoms can be experienced up to 1.2 miles away in rolling terrain; 1.5 miles away in valleys; and 1.9 miles away in mountainous regions. These symptoms are being referred to as 'Wind Tower Syndrome' in the U.S., but they are the same symptoms of a proven ailment, Vibroacoustic Disease (VAD)." o Page 46: "The international community recommends generous setbacks from wind farms in order to mitigate any potential health effects and loss to property values. The setbacks range from a minimal 1,500 foot setback to 1 1/2 miles away from any home, school or business. Because symptoms can be suffered up to a mile from a wind farm, one study suggests that turbines should be no closer than 1 1/2 miles from a	Establishing minimum setback distances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	No section.	Human Health

				residence. Others recommend an immediate and mandatory minimum buffer of 1 1/4 miles between a dwelling and an industrial wind turbine, and even more of a buffer between a dwelling and a wind turbine with greater than 2MW installed capacity."			
AG	17	Private Citizen	12/4/2017	The "General Recommendations for Revised Lincoln County [South Dakota] Wind Ordinance" (not yet adopted) specifies a "Setback from Dwelling" of 5280 feet.	Establishing minimum setback distances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	No section.	General
AG	18	Private Citizen	12/4/2017	"Argus Leader" newspaper, Sioux Falls, SD (May 4, 2015), "Lincoln County wind farm debate continues Tuesday" by John Hult: http://www.argusleader.com/story/news/2015/05/04/lincolncounty-wind-farm-debate-continues-tuesday/26896009/ o The planning commission has proposed a setback of five times a turbine's height from any structure on a non-participating landowner's property and a noise limit of 55 decibels at any property line.	Comment noted.	No section.	Land Use Noise
AG	19	Private Citizen	12/4/2017	Bottom line conclusion: • The minimum setback of any industrial wind turbine should be 5280 feet (one mile) from the nearest occupied dwelling.	Establishing minimum setback distances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	No section.	Land Use
AG	20	Private Citizen	12/4/2017	Town of Union, Rock County, Wisconsin, Ordinance #2008-06 (this is a very extensive study of the impact of wind turbines and outlines some very good specific requirements for installations in their vicinity), which they paid $40k to have developed: o Page 5 (Section 20.01.b): "maximum outside audible SPL [sound pressure level] of 35 dBA or 5 dBA over ambient, whichever is lower, in the Town of Union is necessary to protect residents from the adverse health effects associated with large wind turbine noise" and then the document goes on with four pages of supporting information on how they arrived at this conclusion o Page 8 (Section 20.01.c): "a setback of 2640 feet from large wind turbines to the nearest residence or other inhabited structure is necessary to protect the health and safety of Town of Union residents", followed by 3-1/2 pages of supporting information on how they arrived at this conclusion	Establishing minimum setback distances and sound ordinances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks and noise ordinances for various zoning categories.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise
AG	21	Private Citizen	12/4/2017	Canadian Family Physician magazine, Vol. 59, May, 2013 "Adverse Health Effects of Industrial Wind Turbines" (key excerpts below with full report): o "The noise is described as piercing, preoccupying, and continually surprising, as it is irregular in intensity. The noise includes grating and incongruous sounds that distract the attention or disturb rest. The spontaneous recurrence of these noises disturbs the sleep, suddenly awakening the subject when the wind rises and preventing the subject from going back to sleep" o "the noise emissions of IWTs [Industrial Wind Turbines] disturbed the sleep and caused daytime sleepiness and impaired mental health in residents living within 1.4 km of the two IWT installations studied" o "A 2012 board of health resolution in Brown County in Wisconsin formally requested financial relocation assistance for 'families that are suffering adverse health effects and undue hardships caused by the irresponsible placement of industrial wind turbines around their homes and property."' o "Industrial wind turbine noise is perceived to be more annoying than	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise

				transportation noise or industrial noise at comparable sound pressure levels"			
AG	22	Private Citizen	12/4/2017	Bottom line conclusions: • The audible noise from wind turbines has detrimental health effects, including impaired mental health, in residents living up to 1.4 km (0.87 miles = 4590 feet) away; thus, the need for a 5280 foot minimum setback from the nearest occupied dwelling	Establishing minimum setback distances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	Appendix B	Human Health Noise
AG	23	Private Citizen	12/4/2017	Minnesota Department of Health, Environmental Health Division, "Public Health Impact of Wind Turbines" (May 22, 2009); Conclusions (page 25, with full report PDF file below: o "Low frequency noise is primarily a problem that may affect some people in their homes, especially at night." o "Sleeplessness and headache are the most common health complaints and are highly correlated (but not perfectly correlated) with annoyance complaints." o "Low frequency noise from a wind turbine is generally not easily perceived beyond 1/2 mile. However, if a turbine is subject to aerodynamic modulation because of shear caused by terrain (mountains, trees, buildings) or different wind conditions through the rotor plane, turbine noise may be heard at greater distances." o "Most available evidence suggests that reported health effects are related to audible low frequency noise. Complaints appear to rise with increasing outside noise levels above 35 dB(A)."	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise
AG	24	Private Citizen	12/4/2017	Canadian Family Physician magazine, Vol. 59, May, 2013 "Adverse Health Effects of Industrial Wind Turbines" (page 474, full report in prior section): o "Industrial wind turbine amplitude modulation, audible low frequency noise, tonal noise, infrasound, and lack of nighttime abatement have been identified as plausible noise characteristics that could cause annoyance and other health effects."	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise
AG	25	Private Citizen	12/4/2017	"Wind Turbine Impact Study" by Appraisal Group One, Sept 9, 2009 performed on data from Dodge and Fon du Lac Counties, Wisconsin (389 ft. tall wind turbines), with full report in Section #1: o "the final WHO [World Health Organization] document of 1999 reversed that statement: 'The evidence on low frequency noise is sufficiently strong to warrant immediate concern."'	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	No section.	Noise
AG	26	Private Citizen	12/4/2017	"Wind Turbines: A Different Breed of Noise?", from Environmental Health Perspectives, Volume 122, Issue 1, January 2014, http:Uehp.niehs.nih.gov/122-a20/ o "Shortly after the turbine switched on in 2010, Sue began experiencing headaches, dizziness, insomnia, and a ringing in her ears. When she noticed the symptoms briefly disappeared during trips out of town, she began attributing them to the arrival of the turbine. Within two years she was ready to leave." o 'wind turbines generate lower frequencies of sound than traffic. These lower frequencies tend to be judged as more annoying than higher frequencies and are more likely to travel through walls and windows. infrasound, or sound frequency lower than 20 Hz-inaudible to the human ear-has been associated in some studies with symptoms including fatigue,	WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise

				sleeplessness, and irritability, as well as with changes to the physiology of the inner ear that have poorly understood implications."			
AG	27	Private Citizen	12/4/2017	Bottom line conclusions: • Sub-audible noise (infra-sound vibration) is a contributing factor in the adverse health effects outlined in the audible noise section noted previously. • A minimum setback of 5280 feet from the nearest occupied dwelling is needed to minimize potential impact	Establishing minimum setback distances are outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	Appendix B, 3.5, and 4.5 of the EA. 4.5 and 5.5 of the PEIS	Noise
AG	28	Private Citizen	12/4/2017	Minnesota Department of Health, Environmental Health Division, "Public Health Impact of Wind Turbines" (May 22, 2009); Conclusions (page 25, with full report in section #4): o "Shadow flicker can affect individuals outdoors as well as indoors, and may be noticeable inside any building. Flicker can be eliminated by placement of wind turbines outside of the path of the sun as viewed from areas of concern, or by appropriate setbacks."	Comment noted. Establishing setback distances is outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual
AG	29	Private Citizen	12/4/2017	The "General Recommendations for Revised Lincoln County [South Dakota] Wind Ordinance" (supplied in Section #3) specifies a Shadow Flicker on Dwelling "Maximum Annual Total" of 15 hours	Comment noted. Establishing setback distances is outside of WAPA's authority. Typically, county zoning boards are responsible for ratifying minimum setbacks for various zoning categories.	No section.	Visual
AG	30	Private Citizen	12/4/2017	"Autism and Wind Turbines" (http://www.windawareireland.com/soclal-issues/) o "in the UK, Planning Inspectors and Planning Authorities have been sufficiently convinced of the effects of infrasound on those with Autistic Spectrum Disorders that they have refused planning permission for several wind energy facilities on the grounds that there were individuals living nearby with the condition. For example, a wind energy facility planned for North Lincolnshire was rejected in 2010 because of the serious effect it would have on twin autistic boys living nearby. A report from a Clinical Psychologist in this case pointed out the 'extreme distress' that turbines could cause to people with autism. In this particular case, the twin boys had a fixation with spinning objects and the report asserted that 'the time they spend engaged in spinning and observing objects had to be limited in order to allow them to engage in other more meaningful activities."'	Comment noted. WAPA is committed to scientific integrity. WAPA will review and consider the best available credible scientific evidence regarding wind project impacts.	No section.	Visual Human Health
AG	31	Private Citizen	12/4/2017	Bottom line conclusions: • A "shadow flicker" analysis needs to be performed on the proposed project's potential impact on neighboring households • The impact of infrasound and/or the rotation of wind turbines can have a detrimental impact on people with autism, as they are very sensitive to lighting and noise • Julia Stach, daughter of Ken and Lila Stach, would be 1.04 miles from the nearest proposed "'500 foot wind turbine and would be potentially impacted by its motion and infrasound noise	Comment noted. Prevailing Winds completed a shadow flicker analysis.	Appendix M of the EA.	Visual Human Health
AG	32	Private Citizen	12/4/2017	"New Scientist" article "Farmland Birds Still Chirpy Despite Wind Turbines" (October 1, 2008), link: https ://www.newscientist.com/article/dn14845-farmland-birds-still-chirpy-despite-wind-turbines/ o "They found that all the species - including several listed on the Red List of endangered species - were found in equal numbers across the area, whether they were within 150 meters or 750 meters of the turbines. There was one notable exception: the team found more common	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife

				pheasants (Phasianus colchicus) as they moved further away from the turbines. Why pheasants would be more disturbed by wind turbines than crows, skylarks and yellowhammers is not entirely clear. The researchers suggest it might be because pheasants are larger and less able to make quick sharp turns. This could make them more likely to collide with the turbine blades."			
AG	33	Private Citizen	12/4/2017	Conclusion: • The impact of wind turbines on pheasants is greater than for other species of birds, as they are less able to make quick sharp turns.	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AG	34	Private Citizen	12/4/2017	US Fish and Wildlife Service website (http://www.fws.gov/mldwest/wind/wildlifeimpacts/): o "Migratory Birds. The Service estimates that wind turbines may kill a half a million birds a year." o "Bald and Golden Eagles. Eagles appear to be particularly susceptible. Large numbers of golden eagles have been killed by wind turbines in the western states. However, bald eagles have also been killed, although not in the numbers seen in the West."	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AG	35	Private Citizen	12/4/2017	US Fish and Wildlife Service website (http://www.fws.gov/m Midwest/wind/wildlife impacts/inbafatalities.html): o "The number of bats of these species being killed at wind facilities far exceeds any other documented natural or human-caused sources of mortality" o "A paper published in Science estimates that bats typically save farmers $74 per acre, and that the value of bats to agriculture in the continental United States is roughly $22.9 billion annually"	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AG	36	Private Citizen	12/4/2017	US Geological Survey, Fort Collins Science Center (https://www.fort.usgs.gov/science-feature/96): o "Bats are being found beneath wind turbines all over the world. Bat fatalities have now been documented at most wind facilities in the U.S. and Canada and it is estimated that tens to hundreds of thousands die at wind turbines in North America each year."	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AG	37	Private Citizen	12/4/2017	Audubon Society's website: http://www.audubon.org/content/audubons-position-wind-power o Wind farms kill eagles. The infamous Altamont Pass alone kills 65-70 eagles per year, and a study released in September 2013 by U.S. Fish and Wildlife Service biologists documented an additional 67 eagle deaths elsewhere over the last five years. But those are just the ones we know about. The toll is likely higher, and it's increasing. Nationwide, wind turbines have been estimated to kill 573,000 birds per year, including 83,000 raptors.	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AG	38	Private Citizen	12/4/2017	Sioux Falls Argus Leader, May 16, 2013, "Wind turbines deadly for eagles, pheasants; Protected birds die without prosecution of energy companies" o "Every year 573,000 birds are killed by wind turbines, according to an estimate published in March in the peer-reviewed Wildlife Society Bulletin." o "'What it boils down to is this: If you electrocute an eagle, that is bad, but if you chop it to pieces, that is OK,' said Tim Eicher, a former U.S. Fish and Wildlife Service enforcement agent based in Cody."	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife

AG	39	Private Citizen	12/4/2017	Conclusions: • Half a million migratory birds per year are killed by wind turbines. Bald and golden eagles are particularly susceptible. • Tens to hundreds of thousands of bats die at wind turbines in North America each year	Comment noted.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AG	40	Private Citizen	12/4/2017	• In the event of project approval, a $100k "road reclamation bond" is recommended to be required of the developer for three years to ensure our roads are brought back to their original condition in Sanborn County • Jim Farmer, Black Hills Land Developer, said he was able to obtain an $18k "reclamation bond" for $200 for one year (as communicated to Ken Stach on April 4, 2016). Thus, a $100k road reclamation bond (assuming pro-rata) would only cost the developer around $1000/yr. • A minimum of a $100k "road reclamation bond" should be required of the developer, in the event of project approval.	Requiring road reclamation bonds is outside of WAPA's authority.	3.1 and 4.1 of the EA. 3.10 of the PEIS.	Transportation
AG	41	Private Citizen	12/4/2017	"Wind Turbine Impact Study" by Appraisal Group One, Sept 9, 2009 performed on data from Dodge and Fon du Lac Counties, Wisconsin (389 ft. tall wind turbines), with full report in Section #1: o "In a case in Canada, four families had to abandon their homes near the wind farms -prompting the wind company to bury the turbines' collector line near the worst-hit homes. A collector line transports wind-generated electricity below ground within the turbine rows and above ground from the rows to the main substation. The operator also installed an insulator between the neutral line and the grounding grid. It reduced the high frequencies, but didn't completely cure the situation." Conclusion: • In the event of project approval, the developer/operator should install insulators between the neutral line and the grounding grid to minimize potential for stray voltage from underground collector lines.	Comment noted.	No section.	Human Health
AG	42	Private Citizen	12/4/2017	April 27, 2014 airplane crash into wind turbine near Highmore, SD killed four people; link to article below: http:Uwww.nola.com/news/index.ssf/2014/04/4 dead after small plane crash .html	The Project will comply with all FAA requirements regarding setbacks, lighting, and other safety requirements.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AG	43	Private Citizen	12/4/2017	April 19, 2015 report by the National Transportation Safety Board concluded that a contributor to the crash was an inoperable Wind Turbine light, article link below: http://edgarcountywatchdogs.com/2015/04/inoperable-wind-turbine-light-highlighted-in-ntsb-report-on-plane-crash-that-killed-4/	The Project will comply with all FAA requirements regarding setbacks, lighting, and other safety requirements.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AG	44	Private Citizen	12/4/2017	National Agricultural Aviation Association journal (May/June, 2000), article entitled "The Campaign for Responsible Wind Energy Development" by Jay Calleja, Manager of Communications: o Fields nearby or with erected wind turbines or meteorological testing towers will not be sprayed if inaccessible; if accessible they will include significant surcharges	Comment noted.	No section.	General
AG	45	Private Citizen	12/4/2017	National Agricultural Aviation Association journal (May/June, 2000), article entitled "Consequences of Wind Development Not Always in Landowners' Control" by Jay Calleja, Manager of Communications: o Even in cases when aerial applicators decide a field located in or around wind turbines is safe to access, they typically will charge more because	Comment noted.	No section.	General

				they have to carry lighter loads and the field takes longer to spray because of the time it takes to maneuver around the wind turbines.			
AG	46	Private Citizen	12/4/2017	Conclusion: • Aerial application near wind turbine installations is more costly to the farmer landowners. Jim Stach and Les Blindauer, as examples, would have fields that would be inaccessible to aerial application due to existing high-voltage transmission lines and the added hindrance of the proposed wind turbines.	Comment noted.	No section.	General
AG	47	Private Citizen	12/4/2017	As indicated in the NTBS report in Section #11, the safety light on one of the Highmore, SD wind turbines was inoperable at the time of the April 27, 2014 plane crash. • Furthermore, the turbine sits idle to this day, two years after the incident Conclusion: • Wind turbine facility owner/operators have a history of lack of maintenance, as evidenced by the April 27, 2014 crash of a private plane into a wind turbine near Highmore, SD, killing all four passengers. The safety light on the tower was found inoperable on that tower.	The Project will comply with all FAA requirements regarding setbacks, lighting, and other safety requirements.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AG	48	Private Citizen	12/4/2017	From www.saukvalley.com (a northern Illinois newspaper): Article of June 13, 2014, entitled "Costs of decommissioning wind turbines at issue. County urged to consider bonds to insulate from liability." The article states: "it would cost about $19.4 million to take down the 87 turbines, about $224,000 each" (the proposed Sanborn County wind turbines are larger, thus requiring a greater decommissioning cost). Note that the cost cited in this article is above and beyond the scrap value of the materials. • An example of the consequences of not having a decommissioning and removal bond from the state of Hawaii. Conclusion: • A minimum of a $250k "wind turbine decommissioning bond" per wind turbine is recommended to be required of the developer, in the event of project approval, for the life of operation of the equipment (expected 30 years) = $2.25M decommissioning bond for 30 years	A decommissioning plan was developed for the wind farm portion of the Project and is available on the PUC's website (https://puc.sd.gov/commission/dockets/electric/2018/EL18-026/prefiledexhibits/prevailing/a11-2.pdf). The decommissioning plan calculates decommissioning costs. Information about decommissioning the gen-tie transmission line is available upon request.	Chapter 3, 3.5 of the PEIS Chapter 2 of the EA	Decommissioning
AG	49	Private Citizen	12/4/2017	"Wind Turbine Impact Study" by Appraisal Group One, Sept 9, 2009 performed on data from Dodge and Fon du Lac Counties, Wisconsin (389 ft. tall wind turbines), with full report in Section #1: o Page SS: "when the wind stops blowing, traditional power plants have to be constantly on (or "spinning") and generating reserve capacity equal to the maximum total power of wind turbines - ready at any moment to be 'ramped up' to stabilize the grid. This fluctuating backup system of spinning and ramping makes traditional power plants run inefficiently and increases fuel consumption (emissions). Keeping the necessary additional reserve capacity, and factoring in ramping up and down, will increase the fuel consumption (emissions) at least 8-10% compared with the steady operation of traditional power stations"	Comment noted.	No section.	General
AG	50	Private Citizen	12/4/2017	"The Impact of Wind Power on Household Energy Bills", Evidence to the House of Commons Energy and Climate Change Committee, by professor Gordon Hughes, University of Edinburgh, July 10, 2012; http:l/www.thegwpf.org/images/stories/gwpf-reports/hughes-evidence.pdf o "On this basis the average household electricity bill would increase from £528 per year at 2010 prices to a range from £730 to £840 in 2020 under	Comment noted.	No section.	General

				the Mixed Wind scenario. These figures amount to increases of 38% to S8% in the average household bill relative to the baseline under the Gas scenario. The equivalent ranges for the other scenarios are 29-46% for the More Onshore Wind scenario and 40-62% for the Future Offshore Wind scenario." o "In summary, wind generation imposes heavy costs on other parts of the electricity system which are not borne by wind operators. This gives rise to hidden subsidies that must be passed on to electricity consumers. In the interest of both transparency and efficiency, wind operators should be required to bear the costs of transmission, storage and backup capacity needed to meet electricity demand. Only then will it be possible to get a true picture of the costs and benefits of relying on wind power rather than alternative ways of reducing C02 emissions."			
AG	51	Private Citizen	12/4/2017	From the website WindOntario.ca; http://www.windontario.ca/ (Ontario Province, Canada): o 4% of our power is from wind energy, yet it costs us 20% of our electrical bill. o Ontario pays 11-13.5 cents per kWh for wind power. o The average price for Ontario nuclear, water and gas is 7 cents.	Comment noted.	No section.	General
AG	52	Private Citizen	12/4/2017	Conclusions: • Utility companies will have to be pay for and depreciate two sets of assets (the wind turbine assets and conventional fossil fuel assets as "backup" when the wind does not blow); • As a result, consumer electrical prices will increase by at least 8-10% with the installation of wind energy generation	Comment noted.	No section.	General
AG	53	Private Citizen	12/4/2017	Juhl Energy Financials • This subject was covered at length in the County Commissioners meeting of April 19, 2016, as documented on page 1 in the file below.	Juhl Energy's financial statement is outside the scope of this EA.	No section.	Economics
AG	54	Private Citizen	12/4/2017	Latest full year (2014) Balance Sheet below (from Yahoo Finance).	Juhl Energy's 2014 balance sheet is outside the scope of this EA.	No section.	Economics
AH	1	Private Citizen	12/6/2017	Would you please acknowledge receipt of the email with two attachments, one a picture and another, a letter?	WAPA provided the following response on 12/7/17: I received your email with two attachments (one letter and one picture).	No section.	General
AH	2	Private Citizen	12/6/2017	Thank you for the letter dated November 20, 207 announcing the meeting in Tripp, South Dakota on December 13 and an invitation to provide input. I am writing to object as strongly as I can to the OPPOSE the proposed Prevailing Wind Park energy project to produce up to 200 megawatts of generating capacity from up to 100 wind turbines and associated facilities in Bon Homme, Charles Mix and Hutchinson Counties between the towns of Avon, Tripp and Wagner, South Dakota. Our farm is one mile south of Tripp, South Dakota. It is listed with the National Park Service as a Tucek-Sykora Farmstead Historic Site. It is also listed as a South Dakota Family Owned Century Farm.	This property is located outside the area of potential effects (which includes a 2-mile buffer from turbine locations), and, therefore, would result in no impact to this residence.	4.9 and 5.9 of the PEIS Section 3.9 and 4.9 of the EA	Cultural

AH	3	Private Citizen	12/6/2017	When we bought the farm in 1996, it had been vacant for 7 years. The buildings were unpainted, shingles missing and surrounded by hundreds of dead trees. During the 21 years we have owned it, we have spent literally hundreds of thousands of dollars to make it a truly one of a kind historical farm in pristine conditions. All this was done in coordination with the South Dakota Historical Society.Key to this site is the view to the west where we have built a park including two man- made lakes, one 3/4 acre feet, twenty feet deep and one pond one-half acre feet, 7 feet deep, both feed by a well we put in, 340 feet deep. This at a cost of roughly $100,00.The plan here was to have an unobstructed view to west, the horizon and beautiful South Dakota sunsets.Then came the windmills now 5 miles west of our farm. No one contacted us for input. Now, looking west we see white elephants during the day and a sea of red at night. At great cost, we have removed hundreds of dead trees and moved in more than 30 trees, mostly 15 -20 tall to block the view of the wind mills. But that doesn't work.Now the proposed project would potentially put in dozens more windmills, but this time within two miles west of our farm. We are less then a mile east of Highway 37 one mile south of Tripp and it looks like the windmills would be about 1 mile directly west of Highway 37. For us, this would leave our farm on the very edge of an industrial park. This was to be our dream legacy to our children and grandchildren. There has got to be something very wrong with this kind of hostile move in.	The Project will change the visual landscape. The Project includes best management practices listed in Section 4.7 of the EA to minimize visual impacts.	3.7 and 4.7 of the EA4.7 and 5.7 of the PEIS	Visual
AH	4	Private Citizen	12/6/2017	There is a misleading tax issue as well. Where we live, near Tripp, the understanding was that income from the windmills would reduce property taxes. The Tripp-Delmont School District adjusted accordingly committing more funds for salaries and operations But after a few years, the State of South Dakota has reduced the schools state aid to offset that income. Result? We now have two tax opt outs for school expenses, with the farmers bearing most of the burden and property taxes increasing more than 20 per cent.	Comment noted. State property taxes are outside of WAPA's authority.	No section.	Economics
AH	5	Private Citizen	12/6/2017	Of course, the people who own the property to our west like the idea of the project, they like the income. But very few of them live here. We fear that the voices of the few who are living near or amongst the windmills, hearing the motors and having light shadows flickering on the walls of home in the immediate vicinity, are being overwhelmed by the investors and benefiting landowners. I am writing to Senator Thune and Senator Rounds expressing our frustration and opposition. We implore the Department of Energy to be sensitive to this kind of degradation of our property value. Can you help us? So, I have to ask, what is the impact of opposition voices by the few who actually live here? We look forward to hearing from you.	The Project is being proposed by a private entity, on private property. WAPA's role in the Project is limited to the interconnection request. If there is available transmission capacity on the federal transmission system, WAPA provides open access to transmission services so that energy producers can transmit power to their customers. Any entity requesting transmission services must submit an application to WAPA for interconnection. The federal interconnection process is separate from any State, County, or local permitting and approvals that may be required.	No section.	General
AI	1	Private Citizen	12/19/2017	To Prevailing Winds LLC, persons listed, other associated persons, and in general to whom it concerns, and regarding all and any proposed projects, or any general issue. I am the lawful owner of property in Bon Homme County, South Dakota. I hereby give notice that I do not grant access rights, nor lease rights, nor any rights, nor any claims to my land located in Bon Homme County South	Comment noted.	No section.	General

				Dakota or any other lands that I own in any state in the United States of America. This includes but is not limited to equipment, turbines, and transmission lines for the proposed project Prevailing Wind Park wind energy facility proposed by Prevailing Winds LLC. Any access, encroachment, entry, or physical change to my land is explicitly forbidden. Any access and/or trespass and/or action that results in damage to either my property or the crops and/or property of leasee(s) will result in potential legal action against violators of the law.			
AI	2	Private Citizen	12/19/2017	I am not giving consent to their company for my land.	Comment noted.	No section.	General
AI	3	Private Citizen	12/19/2017	40k acres is ~13%-14% of all land in Bon Homme County, a prime agricultural country for crops and livestock.	Comment noted.	3.6 and 4.6 of the EA	Land Use Land Cover Vegetation
AI	4	Private Citizen	12/19/2017	There is also opposition in the community. There are places all over the country suitable for wind power that won't affect farming and ranching. Why affect food security when there is other land that can be utilized? Forest Service land can be used, for example.	Comment noted.	No section.	General
AJ	1	Private Citizen	1/2/2018	Everything was going good until outside investors promoting Prevailing Wind Farms started causing hard feelings between neighbors who once were friends. Avon is a town of 560 people so when division starts it is hard to mend those hard feelings. I have enclosed a newspaper interview which falsely indicates the project is shovel ready. They haven't even applied for a permit from the State. Also support from WAPA hasn't been finalized. Wind farms are set up to help the rich get richer at the expense of the middle class. I am asking you to not support this project so we can preserve our pristine landscape and our community can return to normal.	WAPA's role in the Project is limited to the interconnection request. If there is available transmission capacity on the federal transmission system, WAPA provides open access to transmission services so that energy producers can transmit power to their customers. Any entity requesting transmission services must submit an application to WAPA for interconnection. The federal interconnection process is separate from any State, County, or local permitting and approvals that may be required.	No section.	General
AK	1	Private Citizen	12/3/2017	Below are listed some of the reasons I am opposed to wind turbine projects: 1) The negative health aspects of wind turbines is well documented. These health effects need to be seriously considered by regulating bodies. Stress from the sounds, infrasound, and shadow-flicker caused by the turbines increases cortisol levels. Elevated cortisol levels make restful sleep impossible. The loss of sleep alone is enough to shorten lives. Chronic agitation and anxiety with stress and elevated cortisol levels ruin quality of live.	WAPA's review of human health impacts, as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AK	2	Private Citizen	12/3/2017	2) Wind turbines decrease property values. Property in a rural setting has traditionally been the "Life savings" of landowners. Wind Turbine placement robs these retirees of a significant portion of their life savings.	WAPA's review of socioeconomic impacts (such as property values and tax revenues), as detailed in the PEIS, used the best available credible scientific evidence and found no significant impacts. WAPA is committed to scientific integrity and will review and consider any new additional information during the review of Prevailing Winds.	3.10 and 4.10 of the EA 4.10 and 5.10 of the PEIS	Economics
AK	3	Private Citizen	12/3/2017	3) The tax advantages of industrialized wind turbines is such that it promotes wealth for the rich, shouldered by taxing the poor, while eliminating the middle class. The middle class is the source of long term well-being for the economy. The Production Tax Credit is the only reason these are being built and should have been eliminated for wind energy years ago.	The Production Tax Credit program is administered by the U.S. Internal Revenue Service and is outside the scope of this EA.	No section.	Economics

AK	4	Private Citizen	12/3/2017	4) On every level, wind turbines are an insult to nature. In the air they massacre migratory birds and bats. At the soil level, the vibration, drying effect, and noise disturbs and repels insects and soil biology. In between, the absence of wildlife is profound. With construction of each tower compacted soil ensues.	Comment noted.	Chapters 3 and 4 of the EA; Chapters 3, 4, and 5 of the PEIS	Wildlife Soils
AK	5	Private Citizen	12/3/2017	5) The presence of wind turbines destroys the serene and sublime beauty of our landscapes valuable for our peace of mind as well as our future. This precious part of rural life cannot be quantified.	Comment noted.	No section.	General
AK	6	Private Citizen	12/3/2017	6) Another un-quantifiable aspect of rural life is the community cohesiveness ripped apart by greed. Many communities are unaware of the invasion until construction has begun. The majority of landowners do NOT want them! Rural communities besieged with wind turbines lose the community spirit that has helped them survive.	Comment noted.	No section.	General
AK	7	Private Citizen	12/3/2017	7) Why does the government require less approval for an invasive, destructive, permanent junkyard in a community than it requires for a private person doing dirt work on their land? Wetlands are necessarily protected by our government as a fragile ecosystem not to be damaged in order to preserve the balance of nature. Water projects are monitored by the government because "everyone owns the water." Why so little scrutiny on permanent effects for wind turbine placement?	The Project has been sited to avoid wetlands whenever possible.	3.3 and 4.3 of the EA.	Water Resources
AK	8	Private Citizen	12/3/2017	8) Escrow accounts sufficient to return the land to its former state of beauty and function should be required of each wind energy project. Mechanically weak, technologically unsound, short-lived towers no longer functioning must be removed without further taxpayer expense. To require less than that is unfair to every bonded business in the area.	Requiring escrow accounts is outside WAPA's authority.	No section.	Decommissioning
AL	1	Maxwell & Bowar Agency, Inc.	11/30/2017	I recently saw an ad in our local paper here in Parkston, SD regarding the proposed Prevailing Wind Park Project. I am unable to attend the meeting on Dec 13 in Tripp. I am interested if there is any investment opportunities that will still exist. I understand WAPA is just the purchaser of the power but I do not have any contact info for Prevailing Winds LLC. Can you provide a name with Prevailing winds or do you have any other investment info. I remember at one point I thought this project was turned down by locals in the area…but I may be wrong?	WAPA forwarded this comment to the Developer on 12/7/2017. The Developer will contact you if an opportunity exists.	No section.	General
AM	1	Private Citizen	12/13/2017	As a landowner that actually resides within the footprint of the PREVAILING WINDS project, I would like to express my vehement opposition. I currently live within the blinking red shadow of their previous project, and cannot express enough my disbelief, that there is a chance of it being extended even closer to my residence. Our third generation family farm, where we have tried to maintain the integrity of our surroundings, and pristine setting, is now being threatened by a group of entrepreneurs, concerned about PROFIT. Where I live, we have concentrated on maintaining & promoting a habitat for wildlife, that South Dakota much promotes. I work to keep the area as undisturbed as possible, often to my financial detriment, because this is what being a "steward of the land is about." As things currently exist, I am already deluged with more than my share of above ground utilities. In my immediate area, already effecting spraying/farming/wildlife, we have B-Y Electric, Charles Mix Electric, East	Comment noted.	No section.	General

				River Electric, & WAPA towers How much more, in the name of strangers financial gains, do I have to succumb to & be surrounded by ?			
AM	2	Private Citizen	12/13/2017	I am concerned as to devaluation of my property, as if we don't have enough unsightliness. Say what you want, there are plenty of folks out there that are still afraid of living in the shadow of your towers and undoubtedly the footprint of these windmills. Perception is reality for many, as I have seen tremendous photos of my land taken, only to have the WAPA towers photo-shopped out, or had visitors worried about the buzzing from the WAPA towers. Now I have to worry about these windmill beasts ? At some point will I have to be signing a "disclosure" should I decide to sell?, as if there was a something detrimental to health on the land?.	Comment noted.	No section.	General
AM	3	Private Citizen	12/13/2017	I next question, has a public safety study been done on the project ? Law enforcement, Fire & Rescue, vulnerability to acts of terrorism ? We are looking at a major project, tied into a major grid, accessible to whoever, high visibility with minimal public service. Ask PG&E (Pacific Gas & Electric) how much they calculate & spend on infrastructure security. Are we going to have additional public safety? hospital capabilities? firefighting equipment? security patrols, reasonable response times?	Comment noted.	3.1, 3.12, 4.1, and 4.12 of the EA. 3.8, 3.9, 3.10, 5.12, 5.13, and Chapter 6 of the PEIS.	Human Health Infrastructure
AM	4	Private Citizen	12/13/2017	I certainly hope that the DOE takes into account that this investment scheme, being supported by production tax credits, would be detrimental to the folks that actually live within its footprint, and want to merely farm & live in a quiet, flicker-less, relatively undisturbed area of God's great earth....	Comment noted.	No section.	General
AN	1	Private Citizen	12/13/2017	I am writing to voice my opposition to the proposed wind energy facility in Bon Homme, Charles Mix and Hutchinson counties of South Dakota. Not only do these facilities not benefit land owners but they are extremely harmful to humans and wildlife. The projects that have been completed to date have only increased energy costs for local residents. I am also greatly disturbed by the timing of this ONE meeting. To schedule this in the middle of the Holiday season can only benefit WAPA as attendance will surely be affected. I believe this was deliberate and carefully planned to diminish attendance. I do not want any of these horrid contraptions on my land!	Comment noted.	No section.	General
AO	1	Private Citizen	11/25/2017	I received your letter this week and can tell you I am in favor of this project. I own 80 acres of land and can not tell from the enclosed map if I would get a wind turbine or not. Could someone let me know if I am or not?	Wind leases are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	General
Draft EA Public Review Period							
AP	1	Private Citizen	undated	It has come to our attention with your letter, that you are asking for public comment, since we live near a proposed wind farm project [Prevailing Winds] I felt we need to respond. My husband and I have seen many changes in our life some for the good and many others that should never have happened. We feel that wind farms are one of those that should have never came to light. We have been told before of how many things are good for the environment only to find out that it is not so (sic).	Comment noted.	No section	General

AP	2	Private Citizen	undated	We are finding out more and more about how they are having a negative effect on people's health, the wildlife even down to the insects that inhabit our soil (sic).	WAPA's review of human health impacts, as detailed in the PEIS and EA, used credible scientific evidence and found the Project would result in no significant impacts to human health. Implementation of BMPs (Section 4.6.1) and Species-Specific Avoidance and Minimization Measures (Section 4.6.2.3) will limit impacts to wildlife.	3.6, 3.12, 4.6, and 4.12 of the EA 3.8, 4.5, 4.6, 4.10, 5.5, 5.6, 5.7, 5.10, and 5.13 of PEIS	Human Health Wildlife
AP	3	Private Citizen	undated	We have also been told a lot of these farms are owned by foreign corporations. When are we going to stop letting other countries take away from the USA, it's time to make America great again not foreign corporations (sic).	Comment noted.	No section	General
AP	4	Private Citizen	undated	Why would we want to introduce something to our state that only works 30% to 40% of the time. We have so many other "Green" options that could do the same thing without endangering the environment, wildlife, human health, and the pristine look of our South Dakota skyline.	Comment noted.	3.6, 3.7, 3.12, 4.6, 4.7, and 4.12 of the EA 3.8, 4.5, 4.6, 4.10, 5.5, 5.6, 5.7, 5.10, and 5.13 of PEIS	Human Health Wildlife Visual
AP	5	Private Citizen	undated	Electricity came to our rural areas to help people to improve their way of life, now we are told that these wind farms will help our electric rates only to find out this is not so but may even double or triple our rates. This will really make it hard on many of us who live on fixed incomes. This is not helping to improve our lives but sending us backwards. What I have taken from all this about wind farms it is just another snake in the wood pile, looks good on the outside, but when you get into it the snake appears and strikes. All I see coming from this is split communities, churches and even down to friends and neighbors. We feel there are better options then wind farms that are less costly or destructive. (sic)	Comment noted.	3.10 and 4.10 of the EA. 4.10 and 5.10 of the PEIS	Economics
AQ	1	Private Citizen	undated	This letter is in opposition to the proposed Prevailing Wind Park Energy Facility Project for the following reasons.	Comment noted.	No section	General
AQ	2	Private Citizen	undated	Further setbacks are needed because of the extreme height of the towers. These proposed towers would be the tallest in South Dakota. At least a 3/4 mile to 1 mile setback should be in place.	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for establishing minimum setbacks.	5.5.7.1 of PEIS 4.7.2 and 4.12 of the EA	Land Use
AQ	3	Private Citizen	undated	There are documented health concerns of people who currently live near wind towers. Future health problems for people who are exposed long term to wind towers should be considered in denying this project.	WAPA's review of human health impacts, as detailed in the PEIS and the EA, used credible scientific evidence and found no significant impacts.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AQ	4	Private Citizen	undated	Wind towers decrease the value of the land and property.	A number of studies have assessed the potential impacts of wind projects on property values. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	3.10 and 4.10 of the EA 4.10 and 5.10.1.3 of the PEIS	Economics
AQ	5	Private Citizen	undated	Wind towers change the flyways of and are a danger to migratory waterfowl and other birds. They will not fly over the towers or land under them.	The EA studies the potential effects of the Project on migratory birds, following Tiers 1, 2, and 3 of the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS, 2012). Implementation of BMPs (Section 4.6.1) and Species-Specific Avoidance and Minimization Measures (Section 4.6.2.3) will limit impacts to wildlife.	3.6, 4.6, and Appendices D through L of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AQ	6	Private Citizen	undated	Wind towers ruin the landscape and quality of life. For these reasons, please deny the request of the Prevailing Wind Park Energy Facility. Thank you.	Comment noted.	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual

AR	1	Private Citizen	2/18/2019	Please consider this a letter in strong support for the proposed Prevailing Wind Park Energy Facility Project. I believe that the project has met all the qualifications and requirements on the local, county, state and national levels. As a retired 22 year state legislator I have closely followed the project. The Board of Directors has done an outstanding job of following the rules and requirements at al levels of government. Also the project has worked very hard to meet all the environmental requirements especially concerning wetlands, vegetation, wildlife, cultural and recreational resources. They also have gone over and above to meet social economic and environmental conditions. In all my years as a state legislator and private citizen I have seen a lot of similar reports. This one clearly reveals a superb effort to meet all the requirements for such a project. I have reviewed all 112 pages of the report prepared on the project. It seems very straight forward, thorough and accurate. I am strongly in favor of this project moving forward.	Comment noted.	No section	General
AS	1	Private Citizen	2/13/2019	Upon review of the Environmental Assessment of the above referenced project, I believe there are issues that are not adequately addressed to cover the impact of the project.	Comment noted.	No section	General
AS	2	Private Citizen	2/13/2019	The environmental assessment does not address the impact the proposed project will have on the drainage of the Dry Choteau (sp.) Creek. The proposed project area includes drainages, wetlands, and low lands that provide habitat for flora and fauna. With the proposed setbacks of towers from property lines of 1.5 times the height of the tower, towers will be very close to the creek area. This will result in irreversible damage to the wildlife, birds, mammals and vegetation along the drainage area of the creek throughout the project way down to the Missouri River.	Dry Choteau Creek was identified as a named stream and floodplain in Section 3.3 (Water Resources) of the EA. The nearest proposed turbine to Dry Choteau Creek is approximately 750 feet to the west. As discussed in Section 4.3 of the EA, the Project would incorporate best management practices to address potential effects to water resources, and the Developer would obtain necessary permits for any impacts to wetlands and waterbodies. Disturbed areas would be revegetated to avoid erosion to surface water resources during Project operation. Implementation of BMPs and permit conditions would protect drainageways, streams, and associated aquatic ecosystems.	3.3, 3.6, 4.3, and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Water Resources Wildlife Vegetation
AS	3	Private Citizen	2/13/2019	Also the assessment fails to address the effect the project will have on the occupants/people living in the project area.	The EA evaluates the Project's potential effects to air quality, noise, visual resources, socioeconomics, environmental justice, and health and safety.	3.4, 3.5, 3.7, 3.10, 3.11, 3.12, 4.4, 4.5, 4.7, 4.10, 4.11, and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Air Quality Noise Visual Resources Socioeconomics Environmental Justice Human Health
AS	4	Private Citizen	2/13/2019	It is very ironic that many of the land owners that have signed contracts with Prevailing Winds LLC do not live anywhere close to where a tower will be built. For example, a proposed tower may be built within 900 yards of my property, but the owner on which it is to be constructed resides 4 miles away. Another owner on whose property a tower will be built lives or resides 6 miles away from the site and another lives in California. I am certain they do not care about the environmental impact to this area or land. Or the social or health impact on the people that live in close proximity to a tower.	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for establishing minimum setbacks. The Project complies with all required setbacks to property lines. Contracts are negotiated between the Developer and the landowner and are outside of WAPA's authority. The environment, social, and health impacts of the Project are evaluated as part of the EA.	Various	General

AS	5	Private Citizen	2/13/2019	With the proposed setback of a tower it will be near drainages and back ups that drain into the Choteau Creek. Therefore affecting the entire environment of the project area as well as the organisms and land within. Should setbacks be expanded as proposed in hearings with PUC of South Dakota of 2000 yards from a property line. The proposed tower sites would be very near the Choteau Creek drainage area and will definitely effect (sic) the entire area and flora and fauna found within. Your attention to this matter would be greatly appreciated.	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for establishing minimum setbacks. The Project complies with all required setbacks to property lines. Dry Choteau Creek was identified as a named stream and floodplain in Section 3.3 (Water Resources) of the EA. The nearest proposed turbine to Dry Choteau Creek is approximately 750 feet to the west. As discussed in Section 4.3 of the EA, the Project would incorporate best management practices to address potential effects to water resources, and the Developer would obtain necessary permits for any impacts to wetlands and waterbodies. Disturbed areas would be revegetated to avoid erosion to surface water resources during Project operation. Implementation of BMPs and permit conditions would protect drainageways, streams, and associated aquatic ecosystems.	3.3, 3.6, 4.3, and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Water Resources Wildlife Vegetation
AT	1	Private Citizen	2/16/2019	I am still very upset that our family did not get a turbine on any of our land (which is among the highest in Hutchinson). If I had not been a widow - would I still been taken advantage of (*sic*)?	Comment noted.	No section	General
AU	1	Private Citizen	1/29/2019	Thank you for the opportunity to comment on Prevailing Winds proposed wind project in our area. We have lived in the proposed site neighborhood since 1996, and witnessed the devotement and construction of the Beethoven Wind Project. We could not be happier on how much effort, time and resources were spent on restoring the effected (*sic*) lands by the contractor. We totally support the Prevailing Winds project and the proposed draft of the Environmental Assessment.	Comment noted	No section	General
AV	1	Private Citizen	2/21/2019	As I stated in my last communication to you, I vehemently object to the Prevailing Winds Project. In addition to everything I previously stated , I am now concerned that 1) the turbines create a microclimate around the installation which creates a warming effect, and that 2) the developers have seriously understated the RFI- Radio Frequency Interference which will ensue and which will also prohibit future progress in the area.	WAPA is aware of efforts to study whether wind power contributes to changes in climate. WAPA has reviewed this information and found no scientific consensus regarding the impact of wind power on global warming increases. WAPA did find greater support for the theory that wind turbines re-distribute cool and warm air, and ground and surface level air. The National Telecommunications and Information Administration (NTIA) is responsible for managing the Federal frequency spectrum for radio communications. In that capacity, NTIA works with the Federal Communications Commission (FCC) and with other Federal agencies to identify and resolve technical telecommunication interference issues. Private wind energy developers have no legal obligation to provide information to, or obtain approval from NTIA. Wind farm developers who voluntarily provide details of their wind farm locations and configurations to NTIA can expect that NTIA will distribute such data to the other Federal agencies represented on the Interdepartmental Radio Advisory Committee (IRAC) for comment and will forward comments and concerns, as well as agency points-of-contact information, to the wind farm developer so that any conflicts can be resolved directly between the developer and the IRAC member agency. Additionally, the FCC regulates emission standards for electromagnetic compatibility (including Radio Frequency Interference) via the requirements of Title 47 of the Code of Federal Regulations (CFR).	4.4, 5.4, 6.2 of PEIS 4.4, 4.4 of the EA	Human Health General

AV	2	Private Citizen	2/21/2019	The area does not need the power.	Power generated by the project will be sold to customers, as described in the Project's power purchase agreement (PPA). A PPA is a contract between two parties, one which generates the power (Prevailing Winds) and one which purchases the power (the customer). WAPA does not enter into PPAs, nor does WAPA assist developers in finding a customer.	No section.	Economics
AV	3	Private Citizen	2/21/2019	The state tax benefits to the local schools are a lying misstatement.	Comment noted.	3.10 and 4.10 of the EA 4.10 and 5.10 of the PEIS	Economics
AV	4	Private Citizen	2/21/2019	The cost to the taxpayer in tax incentives to the Prevailing Winds company would be better spent in hardening the electric grid from malicious disruption. Please curtail the Prevailing Winds project.	As stated in the PEIS and EA, Project developers shall work with appropriate agencies (e.g., DOE and Transportation Security Administration) to address critical infrastructure and key resource vulnerabilities at wind energy facilities, and to minimize and plan for potential risks from natural events, sabotage, and terrorism	5.5.13.3 of PEIS 4.12.1 of the EA	Economics Safety
AW	1	Private Citizen	2/19/2019	Once again the South Dakota PUC ignored the citizens with the approval of the Prevailing Wind Turbine project. The majority of the residents and landowners within the footprint of this wind project objected to this project. Yet, the PUC ignored them and approved it!! I am a landowner that lives out of state, but have followed this project, hoping and praying that the PUC would do the right thing for the people and deny the project. Some of the residents pleaded with the PUC, but unfortunately they didn't listen. They based their decision on big wind information, witnesses and money.	Commented noted. The South Dakota Public Utilities Commission (SD PUC) operates separately from the WAPA environmental process. Any permissions or approvals from the SD PUC are outside the scope of WAPA's authorities.	No section	General
AW	2	Private Citizen	2/19/2109	Because of their decision, the wildlife will be endangered, land values will decline, the landscape of the area will be destroyed FOREVER, and the health and wellbeing of the people will be in jeopardy. WHAT A TRAGEDY! The people of the great state of South Dakota deserve better, rather than public officials that have been bought off by big wind and their lobbyists. The Public Utilities Commission has forgotten that they represent the residents of the state – not lobbyists.	Commented noted. The South Dakota Public Utilities Commission (SD PUC) operates separately from the WAPA environmental process. Any permissions or approvals from the SD PUC are outside the scope of WAPA's authorities.	3.6, 3.12, 4.6 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Wildlife Human Health
AW	3	Private Citizen	2/19/2019	I would never live within an industrial wind project. No one would, not even the big wind people, their lobbyists and investors. Yet, they expect farmers and residents to do just that. It is incredibly sad to think about the destruction of the state for the sake of big money for the big wind people, investors and large corporations. These wind projects are destructive to the state's incredible wildlife, and the people within this wind project are expected to endure all the negative health effects that turbines of this size (600 ft.) cause. These projects should never be built in populated areas. Instead, the state is being flooded with these massive industrial wind turbines. I am totally against this project being built. I don't feel that it is in the best interest of anyone that has to endure the hazards that these turbines present, and it will be devastating to the residents and wildlife in the area. I pray that somehow, someway, this project will be stopped.	WAPA's review of human health impacts, as detailed in the PEIS and EA, used credible scientific evidence and found the Project would result in no significant impacts to human health. Implementation of BMPs (Section 4.6.1) and Species-Specific Avoidance and Minimization Measures (Section 4.6.2.3) will limit impacts to wildlife.	3.6, 3.12, 4.6, and 4.12 of the EA 3.8, 4.5, 4.6, 4.10, 5.5, 5.6, 5.7, 5.10, and 5.13 of PEIS	Human Health Wildlife
AX	1	Private Citizen	2/22/2019	I do not understand how and industrial when project can be placed where their are migrating birds that fly over this region. I have lived here all my life and so enjoyed watching them come over. We have land next to the Beethoven project and have seen firsthand the number not their. From the geese, deer as well as pheasants numbers have been cut down. My worries are watching these numbers going down. For example seeing that	The EA studies the potential effects of the Project on migratory birds, following Tiers 1, 2, and 3 of the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS, 2012), and found the Project would not likely adversely affect birds.	3.6, 4.6, and Appendices D through L of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife

				the whooping cran numbers are only 505. South Dakota brings in so much between Tourism as well as hunting. (*sic*)			
AX	2	Private Citizen	2/22/2019	These wind companies don't live anywhere near where these wind turbines are. Seeing first hand how they don't Monitor the dba after a few years. Seeing ice on the roads that we use. From November until February to clean up the oil from these turbines. They are polluting our environment. I feel that big wind don't care about anything but the money and not the wild life that inhabits this area. I beg that better studies need to be done and for a longer time to get a true feel for what wildlife that is around. You can't come in for a short time and expect to truly see how many animals that are here.	The Project will conduct post-construction noise monitoring as per PUC Condition 27 (https://puc.sd.gov/commission/orders/electric/2018/el18-026final.pdf). Icing control was discussed in Section 4.12.2.4 of the EA and addressed by implementing industry-recommended setbacks. Potential impacts of pollutants and associated BMPs were discussed throughout Chapter 4 (Environmental Consequences) of the EA. Wildlife studies conducted for the Project began in 2015, were coordinated with USFWS and SDGFP, and followed the USFWS Land-Based Wind Energy Guidelines.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Noise Human Health Wildlife
AY	1	Private Citizen	2/22/2019	1. there are 2 waterfowl production areas in this project which will disrupt the eco system in this set project.	As discussed in the EA, no Project facilities would be placed on the waterfowl production areas. WAPA's review of wildlife impacts, as detailed in the PEIS and EA, used credible scientific evidence. Implementation of BMPs (Section 4.6.1) and Species-Specific Avoidance and Minimization Measures (Section 4.6.2.3) will limit impacts to wildlife.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
AY	2	Private Citizen	2/22/2019	2. it will have a negative impact on two businesses in the proposed project. This area is a haven for pheasant and duck hunters who come from all over the world. the economic impact on the businesses that rely on the income from these natural resources will be greatly reduced.	WAPA infers that the two referenced businesses are related to hunting/outfitting. The Project will not physically alter access to public hunting areas (GPAs and Walk-In Areas). The EA describes impacts to waterfowl and other game birds, and additional discussion was added in Section 3.6.2.1. With the implementation of BMPs and Species-Specific Avoidance and Minimization Measures, the Project would avoid or minimize impacts to these resources.	4.10 and 5.10 of PEIS 3.1.3, 3.6.2, 3.10, 4.6, 4.10, and 5.0 of the EA	Wildlife Economic
AY	3	Private Citizen	2/22/2019	3. I have personally witnessed the total destruction of a family effected by this project. How many more lives have to be sacrificed for the project. Apparently as the legislature already stated it is all about the money not the value of humans and family values that are important. I as a taxpayer do NOT want my tax money supporting this kind of behavior. If the developers can come to a more compatible solution to the issues at hand I would be more receptive to the project.	Comment noted.	No section	General
AY	4	Private Citizen	2/22/2019	4. after a lot research it is becoming more and more evident that there are very serious health concerns surrounding Industrial wind projects such as these. I would strongly urge wapa to hold of on granting permission until all these concerns can be addressed and sufficiently taken care of.	WAPA's review of human health impacts, as detailed in the PEIS and the EA, used credible scientific evidence and found no significant impacts.	3.12 and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health
AZ	1	Private Citizen	2/1/2019	I reviewed the 100+ page document and find that a very thorough review was undertaken and I am more than satisfied that every care and precaution was taken to protect our environment and local residents.	Comment noted.	No section	General
BA	1	SD DENR	2/11/2019	The South Dakota Department of Environment and Natural Resources (DENR) Surface Water Quality Program has reviewed the proposed Prevailing Wind Park project. The DENR finds that this construction, using conventional construction techniques, should not cause violation of any statutes or regulations administered by the DENR based on the following comments:	Comment noted.	No section	General
BA	2	SD DENR	2/11/2019	1. At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site. Any construction activity that disturbs an area of one or more acres of land must have authorization	Comment noted. The Draft EA notes construction of the Project would require coverage under the General Permit for Storm Water Discharges Associated with Construction Activities issued by the SDDENR.	Section 4.2.2 of the EA	Soils

				under the General Permit for Storm Water Discharges Associated with Construction Activities. Contact the Department of Environment and Natural Resources for additional information or guidance at 1-800-SDSTORM (800-737-8676) or http://denr.sd.gov/des/sw/StormWaterandConstruction.aspx.			
BA	3	SD DENR	2/11/2019	2. A Surface Water Discharge (SWD) permit may be required if any construction dewatering should occur as a result of this project. Please contact this office for more information.	Groundwater dewatering is not anticipated to be a major concern within the Project Area, because wind turbines will most likely be placed at higher elevation where the water table tends to be deeper. Should groundwater be encountered that must be dewatered, the necessary permits would be obtained, and the duration of dewatering would be limited to the extent possible. Dewatered groundwater would be properly handled to allow sediments to settle out and be removed before the water is discharged, to reduce soil erosion and sedimentation of surface waters.	No section.	Water Resources
BA	4	SD DENR	2/11/2019	3. Impacts to tributaries and wetlands should be avoided or minimized if possible. These water bodies are considered waters of the state and are protected under the South Dakota Surface Water Quality Standards. The project area is in the vicinity of Cosby WPA, Bucholz WPA, and Schaefer WPA. These waterbodies are classified by the South Dakota Surface Water Quality Standards and Uses Assigned to Lakes for the following beneficial uses: (6) Warmwater marginal fish life propagation waters; (8) Limited contact recreation waters; and (9) Fish and wildlife propagation, recreation, and stock watering waters. Because of these beneficial uses, special construction measures may have to be taken to ensure that the 30-day average total suspended solids criterion of 150 mg/L is not violated.	Impacts to wetlands and waterbodies would be minimized. No Project facilities would be placed on WPAs. Construction of the Project would require coverage under the General Permit for Storm Water Discharges Associated with Construction Activities issued by the SDDENR. A condition of this permit is the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would be developed during civil engineering design of the Project and would incorporate BMPs to control erosion and sedimentation.	3.6 and 4.6 of the EA. Chapters 4, 5, and 6 of the PEIS.	Water Resources
BA	5	SD DENR	2/11/2019	4. The discharge of pollutants from any source, including indiscriminate use of fill material, may not cause destruction or impairment except where authorized under Section 404 of the Federal Water Pollution Control Act. Please contact the U.S. Army Corps of Engineers concerning these permits.	The Developer would obtain necessary Section 404 permits from the U.S. Army Corps of Engineers (COE) for impacts to waters of the U.S. The Project has coordinated with the COE, including submittal of a pre-construction notification package on December 19, 2018.	4.4 and 5.5 of PEIS Section 4.3 of the EA	Water Resources
BA	6	SD DENR	2/11/2019	This office requests the opportunity to review and comment on any significant changes that may be proposed before the project is completed. Thank you for the opportunity to comment on the proposed project. If you have any questions, please contact me at 605-773-3351 or Shannon.Minerich@state.sd.us.	Comment noted.	No section	General
BB	1	Private Citizen	2/21/2019	I am not pleased with the proposed building of towers within a half mile of our property. The financial benefit is only to a few and the eyesore is forever. Questions:	Comment noted.	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual
BB	2	Private Citizen	2/21/2019	1. I have been trying to determine where these towers will be placed. Please send me a detailed map of the proposed locations of towers.	Figure 2-1 in the EA identifies the proposed locations of towers and is the most detailed information available at this time.	2.1.1 of the EA	General
BB	3	Private Citizen	2/21/2019	2. Has an EPA study been completed and passed? Please provide.	WAPA is the lead federal agency for this EA, prepared under the National Environmental Policy Act. EA-level documents do not require submittal and approval by the EPA. The Developer is required to comply with EPA regulations and permit conditions, including air quality and hazardous materials regulations.	Section 3.4 and 4.2 of the EA	General

BB	4	Private Citizen	2/21/2019	3. What escrow has been set up to repair damage to the local roads with the heavy equipment use of our roads? Amount?	Requiring escrow accounts is outside WAPA's authority. The developer filed an escrow agreement as part of the SDPUC process in February 2019 (available at https://puc.sd.gov/commission/orders/electric/2019/el18-026liaison.pdf). In addition, the Developer has entered into Road Use Agreements with the counties and townships in the Project area.	5.1.2 of PEIS 4.10 of the EA	Economics
BB	5	Private Citizen	2/21/2019	4. What payments to us are planned for use of wind crossing our property to be used by the tower? Amount?	Payments are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	Economics
BB	6	Private Citizen	2/21/2019	5. Why isn't a referendum required for all land owners to approve/disapprove this project? What process can require this to be completed before start of the project?	The Project is being proposed by a private entity, on private property. WAPA's role in the Project is limited to the interconnection request. If there is available transmission capacity on the federal transmission system, WAPA provides open access to transmission services so that energy producers can transmit power to their customers. Any entity requesting transmission services must submit an application to WAPA for interconnection. For more information about the interconnection process, visit WAPA's website at: https://www.wapa.gov/transmission/interconnection/Pages/process.aspx. The federal interconnection process is separate from any State, County, or local permitting and approvals that may be required.	No section.	General
BC	1	Farm Service Agency - SD	2/15/2019	Hi Christina, If you have GPS files for the Prevailing Wind Park, South Dakota I would appreciate a copy. Farm Service Agency has a secured farm loan on one property needing an easement and we would like to make sure there are not any additional producers that we are unaware of. Please let me know if you have any questions.	The Developer responded by email on 2/15/2019.	No section.	General Economics
BD	1	Private Citizen	1/29/2019	I live on a farm near Letcher, SD, which is probably a good 60 miles from the proposed project. However, I am still concerned and would like to provide my input. As a farmer, I cannot enhance water drainage from my ground onto a neighbor's ground to improve my ability to produce corn or soybeans on my farm…for the very simple reason that it impairs the value/ability of my neighbor to do so. Installation of these massive wind turbines is no different. If one neighbor installs them, it impairs the value of the other neighbors' adjacent farms! Quite simply, it reduces the value of the land for farming and for potential residential development. "Big wind" will say otherwise, using their highly paid "consultants" and lawyers to try to sway public officials! But, they are wrong. Just ask the little man! Or, ask a well-respected real estate agent like Ralph Kiner (owner of Mitchell Realty in Mitchell, SD).	A number of studies have assessed the potential impacts of wind projects on property values. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	3.10 and 4.10 of the EA 4.10 and 5.10.1.3 of the PEIS	Economics
BD	2	Private Citizen	1/29/2019	I am NOT opposed to wind energy; however, those neighbors within two miles of such a facility need to sign a release waiver/agreement (and potential be compensated for value impairment to their farms).	Comment noted.	No section.	General
BE	1	Private Citizen	2/21/2019	Thank you for the opportunity to review the 112 page Draft EPA document for the proposed Prevailing Wind Park Energy Facility Project to be located in South Dakota. As this is a draft, it seems to lack some information as to who is going to monitor the construction process to keep the contractors in compliance with this document.	The Project will be monitored during construction by contractors, inspectors, and cultural resources specialists. All site workers will be responsible for adhering to BMPs and Avoidance and Minimization Measures in the EA as well as conditions and measures required by other permits issued for the Project.	Chapter 3 of PEIS	General

BE	2	Private Citizen	2/21/2019	Project life span is projected at 30 years, but wind turbine projected life span is about 25 years. The decommissioning plan does not address how and where the wind turbines will be placed when decommissioned. Who's land disposal gets to receive and recycle these machines. It is noted that figure 2.1 (project map) does not show where the O&M facility and Laydown yard is to be located per statements in document.	A decommissioning plan was developed for the wind farm portion of the Project and is available on the PUC's website (https://puc.sd.gov/commission/dockets/electric/2018/EL18-026/prefiledexhibits/prevailing/a11-2.pdf). Information about decommissioning the gen-tie transmission line is available upon request. On Figure 2-1 the O&M facility and laydown yard are both overlapped in part by the yellow triangle representing the Project substation. Because the size of these facilities is small relative to the scale of the map, the facilities are not shown individually.	Chapter 3, 3.5 of the PEIS Chapter 2 of the EA	Decommissioning
BE	3	Private Citizen	2/21/2019	I am also disappointed about the lack of set back requirements and to location of wind turbines to residents and property lines. It appears that a landowner wanting to have a turbine located on their property can have it located a distance from their residence, but the location maybe to close to their neighbors residence.	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for establishing minimum setbacks.	4.7.2 and 4.12 of the EA	Land Use
BE	4	Private Citizen	2/21/2019	Also it is hard to know how the technology is going to work to keep the wind turbines shadowing effect during specific hours of the day during peak generation times.	A shadow flicker analysis was prepared for the Draft EA.	Appendix M of the EA.	Visual Human Health
BE	5	Private Citizen	2/21/2019	It is difficult to believe the project cost and impacts on the communities (negative and beneficial). That is the funds to be projected to be spent in the communities. Research on how past projects financial impact is not available from the companies who will be building this project. There is no documentation on where the power generated will be sold, no guarantee of any power to South Dakota.	WAPA's review of socioeconomic impacts, as detailed in the PEIS and EA, used the best available credible scientific evidence. Power generated by the project will be sold to customers, as described in the Project's power purchase agreement (PPA). A PPA is a contract between two parties, one which generates the power (Prevailing Winds) and one which purchases the power (the customer). WAPA does not enter into PPAs, nor does WAPA assist developers in finding a customer.	4.10, 5.10 of PEIS 4.10 of the EA	Economic
BF	1	Private Citizen	2/20/2019	I am writing in response to those requesting input on Prevailing Winds Environmental Assessment. I read through the report and I would say the wildlife portion caught my attention. First of all, the entire project is proposed to be located in a vitally important waterfowl production area. The Beethoven Project completely altered the migration route that did at one time run north to south through the area between Wagner and Tyndall. We haven't seen any birds other than a few snow geese. The local birds are the only waterfowl that have used this area over the last three years or so. I also believe this has resulted in the absence and relocation of several bald eagles in the area. If Prevailing Winds Project is built, it will continue to drive the waterfowl farther out of our area. The young birds aren't smart enough to stay away from the towers. As soon as the local and migrating waterfowl are driven out of our area, we will loose all of our raptor species as well. We talk so much statewide about attracting sportsmen, I think we've taken a wrong turn. Not too many waterfowl hunters are going to be attracted to this area.	As stated in the EA, no project facilities will be placed in Waterfowl Production Areas. The EA studies the potential effects of the Project on migratory birds, following Tiers 1, 2, and 3 of the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS, 2012), and found the Project would not likely adversely affect birds.	3.6, 4.6, and Appendices D through L of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
BF	2	Private Citizen	2/20/2019	After reading section three, I realize the paragraph concerning aircraft activity failed to mention the affects on drones and other pilot occupied light aircraft. There are several local farmers using drones and/or powered parachutes for the purpose of scouting fields throughout the growing season. Being challenged with dodging wind towers, field scouting is going to become hazardous, and potentially deadly.	Drones and powered parachutes (PPC) would most likely be flown during calm or low wind conditions when maneuverability is highest and the risk of collision with turbines or met towers is reduced. Drones and PPC are compatible with wind turbines.	No section.	General Land use

BF	3	Private Citizen	2/20/2019	We just traveled to Florida and were made aware of the business sign placement regulations. There is a height limit for the signs, the signs do not protrude above the tree tops for the single purpose of maintaining the attractive landscape for the tourists enjoyment. South Dakota doesn't seem to be concerned about the landscape we are presenting to our tourists.	Comment noted.	3.7 and 4.7 of the EA 4.7 and 5.7 of the PEIS	Visual
BG	1	Private Citizen	2/11/2019	I am writing as a concerned husband, father, grandfather, and great grandfather. Avon has been a great place to live, in the rural areas neighbors helping neighbors is what make life so special in our small community. The proposed Prevailing Wind Park is the first project to create tension in our community. The main reason is the CO commissioners have approved a one thousand foot setback from the neighbors house. As a farmer who has two sons and a grandson farming in the footprint of the Wind Park, we are concerned with losing a very important management tool, spraying with a airplane (*sic*).	Establishing minimum setback distances are outside of WAPA's authority. County zoning boards and the state are responsible for establishing minimum setbacks. Crop dusting is typically carried out during the day by highly maneuverable airplanes or helicopters. The Project's aboveground collection and transmission lines are expected to be similar to existing distribution lines (located along the edges of fields and roadways), and the turbines and meteorological tower(s) themselves would be visible from a distance and lighted and marked according to FAA guidelines. The Project would comply with FAA safety requirements.	No section.	Land Use
BG	2	Private Citizen	2/11/2019	In Dec 2016 Prevailing Winds utilized a provision in federal law to require the rural elective co-op to engage in a federally mandated negotiation process, PERPA. If built BasinElec will have a extra 220 megawatts to find a place for. The enclosed BasinElec rate increase indicates they already have enough electricity. I have enclosed a artical (*sic*) from Avon newspaper, you will notice they don't say anything about needing a permit from WAPA. They also do not inform the public that PURPA was used to force Northwestern to buy power from Beethoven and BasicElec to buy power from Prevailing Wind Park.	Comment noted.	No section.	General
BG	3	Private Citizen	2/11/2019	Also enclosed are the danger to birds from wind turbines. A friend of mine managed a ranch by Wessington Springs, S.D. When the wind turbines went up the deer disappeared, they can chose where they want to live, just jump over the fence. Cattle and humans aren't able to do that.	The EA studies the potential effects of the Project on migratory birds, following Tiers 1, 2, and 3 of the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS, 2012), and found the Project would not likely adversely affect birds. Implementation of BMPs (Section 4.6.1 of the Draft EA) during all phases of the Project would reduce and minimize potential impacts on wildlife by training site workers, properly disposing of waste, limiting the area of disturbance, using only designated roads, restoring habitat, implementing a noxious weed control plan, controlling Project lighting, and reporting wildlife mortalities to the appropriate State or Federal agency. In addition, Species-Specific Avoidance and Minimization Measures (Section 4.6.2.3 of the Draft EA) will further limit impacts to wildlife.	3.6, 4.6, and Appendices D through L of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
BH	1	NRCS	2/25/2019	Thank you for the opportunity to provide Farmland Protection Policy Act (FPPA) review of this project. The project area does encompass prime and important farmlands. Enclosed is a Web Soil Survey map delineating the FPPA farmland classifications of the project area. The area illustrated encompasses approximately 99,000 acres, with about one third classified as prime farmland, about one half classified as important farmland, and the remainder classified as not prime farmland. At this stage of project planning, it is difficult to tell how much of each farmland class the individual components of the project may impact. Typically the best sites for individual towers are on summit locutions facing the prevailing winds. The soils in that position often are affected by slope, and are not prime or important farmland. The underground power collection system should	WAPA completed the referenced form and calculated the total points to be less than 160.	Section 3.2 and 4.2 of the EA	Soil Resources

				not prevent the land from being farmed after it is installed. The surface components, (substation, overhead transmission line, access roads, and operations and maintenance facility will have small footprints relative to the size of the project area, and the attached maps can help you avoid the best farmland early in the planning stage. I have attached a Farmland Conversion Impact Rating Form (AD-1006) for the project, based on the 47 acres of permanently converted cropland and the percentages of the farmland classes listed in Table 3.3 of the Draft EA. The AD-1006 is to be completed by both your agency and by NRCS (instructions are on the back). I have completed Parts II through V. Please complete parts I, VI, and VII (see the attached Site Assessment Scoring for the Twelve Factors Used in FPPA for guidance). If the TOTAL POINTS in part VII are less than 160, the proposed activity will have no significant impact on prime and important farmland, and no further alternatives will need to be considered.			
BH	2	NRCS	2/25/2019	Before actual project construction begins the Natural Resources Conservation Service (NRCS) would advise the applicant to consult with the local NRCS and Farm Service Agency offices regarding any United States Department of Agriculture easements or contracts in the project areas that may be affected. For any other easements outside of the NRCS, you should check with the local courthouse.	Comment noted.	Section 3.2 and 4.2 of the EA	Soil Resources
BI	1	Private Citizen	undated	The wind farm cannot meet the ER or social and economic conditions. This letter was posted to the PUC as a comment to the Prevailing Winds Docket Number EL18-026. We are absentee landowners in the project area. We are opposed to the wind park. Commissioner Chris Nelson of the PUC said the decision to approve the project will be based on facts and facts alone. Let's look at the facts that must be complied with for the approval of the project. The following are the three requirements (FACTS) state by the PUC itself. We don't believe these requirements can be met:	Comment noted. The South Dakota Public Utilities Commission (SD PUC) operates separately from the WAPA environmental process. Any permissions or approvals from the SD PUC are outside the scope of WAPA's authorities.	No section	General
BI	2	Private Citizen	undated	PUC REQUIREMENT (FACT) NO 1. Will not pose a threat of serious injury to the environment nor to the social and economic condition of the inhabitants or expected inhabitants in the siting area. Economic Condition--Inhabitants are economically affected by a bad contract that favors the wind operator/owner. The landowner operating fee contract from the wind energy agreement is a 30 year contract, with a royalty payment per year of $15,200, with a 1.5% increase annually, per turbine for the landowner. The 1.5% increase is compounded annually. Assuming low inflation each year, using present value tables, the royalty payment after 30 years would be approximately $9380 (maybe lower) in today's dollars. Even at the end of 10 years the value of the annual payment in today's dollars has already decreased to approximately $12800. In addition to using present value tables we have worked this out one year at a time by hand to arrive at the same result. That is a bad contract! It is an unfair contract for the landowner who could end up receiving less than half of the agreed upon royalty amount. Please take this to your financial adviser to verify our results. (In the event of high inflation these numbers will be dramatically lower).	Contracts are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	Economic

				Economic Condition--According to section 4 of the main wind energy agreement the above contract can be extended 10 more years to make the total 40. The same annual payment would continue. The value of the payments in today's dollars would continue to decrease to around $6000. This extension is at the sole discretion of the turbine operator, not the landowner. (Same note as above, high inflation will make the number lower.)			
BI	3	Private Citizen	undated	Economic Condition--Impact studies have shown a decrease in value of improved and unimproved property in a wind farm (very serious economic injury to inhabitants).	A number of studies have assessed the potential impacts of wind projects on property values. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	3.10 and 4.10 of the EA 4.10 and 5.10.1.3 of the PEIS	Socioeconomics
BI	4	Private Citizen	undated	Economic Condition--electric rates have increased for inhabitants in a wind farm.	Comment noted.	3.10 and 4.10 of the EA. 4.10 and 5.10 of the PEIS	Economics
BI	5	Private Citizen	undated	Economic Condition--Future unilateral reduction of the royalty checks to the landowner. The wind operator during bad times may decide to reduce the landowner payments leaving the landowner with no recourse.	Contracts are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	Economics
BI	6	Private Citizen	undated	Environmental Condition--Impact on pheasants, birds, migratory birds, and bats.	The EA studies the potential effects of the Project on migratory birds, following Tiers 1, 2, and 3 of the U.S. Fish and Wildlife Service Land-Based Wind Energy Guidelines (USFWS, 2012). Implementation of BMPs (Section 4.6.1) and Species-Specific Avoidance and Minimization Measures (Section 4.6.2.3) will limit impacts to wildlife.	3.6, 4.6, and Appendices D through L of the EA. Chapters 4, 5, and 6 of the PEIS.	Wildlife
BI	7	Private Citizen	undated	Environmental Condition--Road damage. Also scars on the land from the holes in the ground 40 feet deep or more, filled with concrete that will never be totally removed.	The Project has entered into road use agreements with the counties and townships within the Project area to repair and maintain roads. In addition, turbine foundations will be removed to a depth of 42 inches below grade.	3.5 and 5.1.2 of the PEIS 4.10 of the EA	Transportation Decommissioning
BI	8	Private Citizen	undated	Social Condition--We heard the residents who live in the footprint and who spoke at the last PUC meeting beg the commissioners to decline the application. How can you possibly allow 4 or 5 turbines to be built less than a mile away from a residence and not be responsible for destroying the peaceful lifestyle of the inhabitants? Social Condition--We notice that the people who talk in favor of the wind turbines repeat the same general talking points such as "economic development of South Dakota", "harvest our abundant wind resource", "reduce our dependence on fossil fuels", "advance technologically with the rest of the world" etc. None of the speaking pro turbine people live in the turbine footprint nor do they talk about what it is like to live under turbines.	Comment noted.	No section.	General
BI	9	Private Citizen	undated	PUC REQUIREMENT (FACT) NO 2. Will not substantially impair the health or welfare of the inhabitants. Health Impairment--Audible noise, sub audible noise, shadow flicker, sleeping problems, stray voltage, and ice throw. We heard someone say that a person will get accustomed to the noise. When we talk about the noise we have in a modern society we are only talking about noise that we can turn off when we want. The noise from a turbine only stops when the wind is not blowing. The other dangers are obvious.	WAPA's review of human health impacts, as detailed in the PEIS and the EA, used credible scientific evidence and found no significant impacts.	3.5, 3.12, 4.5, and 4.12 of the EA 3.8, 4.5, 4.10, 5.5, 5.7, 5.10, and 5.13 of PEIS	Human Health Noise

BI	10	Private Citizen	undated	Welfare Impairment--Lawsuits from neighbors. This is a real disaster for the social condition and welfare of the inhabitants.	Comment noted.	No section.	General
BI	11	Private Citizen	undated	PUC REQUIREMENT (FACT) NO 3. Will not unduly interfere with the orderly development of the region with due consideration having been given to the views of governing bodies of affected local units of government. Development--There will be none. No one will build a home or business in a wind farm.	A number of studies have assessed the potential impacts of wind projects on property values. WAPA reviewed the best available scientific information and found no significant impacts to property values as a result of wind farms.	3.10 and 4.10 of the EA 4.10 and 5.10.1.3 of the PEIS	Socioeconomics
BI	12	Private Citizen	undated	Development--The confidentiality requirement in the contract makes it almost impossible to sell the land.	Contracts are negotiated between the Developer and the landowner and are outside of WAPA's authority.	No section.	Economics
BI	13	Private Citizen	undated	Development--In the case of the technical obsolescence of the turbines or termination of the contract we find it hard to believe that the money will be available for removal and restoration of the land. A bond is nothing more than a promise to pay and that promise is worthless from an insolvent company.	A decommissioning plan was developed for the wind farm portion of the Project and is available on the PUC's website (https://puc.sd.gov/commission/dockets/electric/2018/EL18-026/prefiledexhibits/prevailing/a11-2.pdf). Information about decommissioning the gen-tie transmission line is available upon request.	Chapter 3, 3.5 of the PEIS Chapter 2 of the EA	Decommissioning
BI	14	Private Citizen	undated	Development--How much will the county increase the assessment of land with turbines? Will the county change the classification of land with turbines?	County tax assessments are outside of WAPA's authority.	4.10, 5.10 of PEIS 4.10 of the EA	Economic
BI	15	Private Citizen	undated	CONCLUSION. The landowner operating fee contract is a bad contract favoring the turbine operator/owner and the project cannot meet the other PUC requirements. The application should be denied.	Contracts are negotiated between the Developer and the landowner and are outside of WAPA's authority. Comment noted.	No section.	Economics