

**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

**IN THE MATTER OF THE
APPLICATION OF DEUEL HARVEST
WIND ENERGY LLC FOR A PERMIT
OF A WIND ENERGY FACILITY AND
A 345-KV TRANSMISSION LINE IN
DEUEL COUNTY**

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**GARRETT HOMAN'S RESPONSE TO
APPLICANT'S FIRST SET OF DATA
REQUESTS**

EL18-053

**Exhibit
G22**

Below, please find Garrett Homan's response to Deuel Harvest Wind Energy LLC's ("Applicant") First Set of Data Requests to Garrett Homan. The original request is restated and followed by my response to that request.

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

The Staff's first data request to Garrett Homan is attached to this response, and I will continue to provide all future correspondences.

- 1-2) Identify the address of your permanent residence (where you reside).

5669 Maple Grove Road, Hermantown, MN, 55811

- 1-3) Identify all property you own within the vicinity of the Deuel Harvest North Wind Farm ("Project") and the location (by section, township, and range) of such property. Are there any habitable buildings on the property you own?

I do not own property in the vicinity of the project.

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

I do not have a residence in the vicinity of the project.

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

This question is broad. Assuming the question is in regards to land in the vicinity of the project, I do not own land there. Regarding how we use my parents' property in the vicinity of the project, my family loves to spend time there enjoying nature in the peace and quiet – such as hunting and fishing, watching the variety of birds and wildlife, developing habitat, stargazing with the clear skies, camping, hiking, canoeing, developing habitat, planting and harvesting pumpkins, picking fruit, and generally enjoying nature and our time together.

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

Unique features of my parents' property that will be impacted by the project include – safe use of the airstrip we're building; abundant wildlife, habitat, and hunting; the local ecosystem, including Monighan Creek and its drainage areas; and our enjoyable use of and future development of the property.

1-7) Describe your concerns regarding the Project.

I have many concerns regarding the Project:

- 1. The safety of my family, friends, and myself in using our airstrip.**
- 2. Noise and shadow flicker negatively affecting the wildlife and driving them away from the habitat we have worked so hard to develop on the property.**
- 3. Noise and shadow flicker and blinking lights negatively affecting my family's use and enjoyment of the property**
- 4. The large grouping of wind turbines affecting the safety of all inhabitants with respect to masking tornadic activity in the area and reducing the ability of meteorologists to track storms and tornados and provide accurate warnings.**
- 5. Risks of ice throw and turbine damage hurting people and damaging property, as well as risk of fires that can't be put out in a timely manner devastating habitat and property and putting human life at risk.**
- 6. The ecological impact associated with construction, operation, and decommissioning – driving wildlife away, directly killing birds, bats, bugs, and butterflies, contaminating ground water and the sensitive Monighan Creek and its drainage systems, pollution from oil leaks, and the**

substantial landfills that will be required to handle a mountain of non-reclaimable materials used in wind turbines.

- 1-8) Describe what mitigation measures would address the concerns you identified in response to Request 1-7 and whether any of the mitigation measures identified by the Applicant in its Application could address any of your concerns.

Keeping a rectangular area measuring 1.0 miles to the west and 1.75 miles to the north, east, and south of our runway free of turbines would allow use of our runway by family, friends, and the general public without substantially affecting flight safety. This would also provide the benefit of protecting the wildlife, habitat, ecosystem, and enjoyable use of our property.

In general throughout the project, increasing the minimum setbacks from property lines to be 1,100 feet would mitigate the risk to non-participating neighbors and the public right of ways for ice throw, by meeting the manufacturers safety recommendations.

In regards to protecting the environment and participants' and non-participants' health and safety, I request a State-managed 24-7 hotline and response department for the intended purpose of providing a means for the public to report environmental, health, and safety issues (such as oil leaks or other pollution, ground water contamination, excessive noise and shadow flicker, road or property damage from ice throw or turbine failures, fire, etc.) observed during project construction and operation and to coordinate the appropriate independent assessments and corrective actions. This hotline and response department should be funded by the Applicant via an escrow account for the duration of the project, but managed by the State to ensure the public's best interest is being served and to remove any potential for the applicant to delay or mishandle reports due to financial incentives.

- 1-9) Identify any documents, information, education, training, or professional experience you have relied upon to form your opinions concerning the Project. Where you have relied upon documents or other tangible materials, please provide such documents and/or materials.

I have read many online articles about the safety concerns of flying around wind turbines, including articles and summaries of the wind turbine accident in Highmore, SD in 2014 that resulted in 4 fatalities. I have attached an article from the Airplane Owners and Pilots Association about the safety effects wind turbines can have on aircraft especially in the vicinity of airports.

I have also spoken with aerial applicators, one being Denny Meyer from Steier Ag Aviation in Whittemore, IA, a highly experienced commercial pilot, who shared his harrowing tale of flying in and around wind turbines and how they “shake the hell out of you.” His business has decided to no longer service land in or around wind turbines due to the substantial safety risk they pose to him and his sons who fly for the family business as well.

I have also read wind turbine wake effect research papers published for the wind turbine industry to use for siting turbines to maximize performance and mitigate turbine blade fatigue life issues from upwind turbine wakes. There are numerous such research papers available online that demonstrate turbine wakes have aerodynamic effects that should be addressed properly, one such that I have attached is Vermeer et al, “Wind Turbine Wake Aerodynamics”, Progress in Aerospace Sciences, Volume 39, Issues 6 and 7, August to October 2003.

I have also educated myself by using the COPA/SMS Report No. 1101, Aviation Safety-risk Assessment of the Effect of Wind Turbines on General Aviation Aircraft (see references), summarizes the results and determinations of a 9-member panel that consisted of experts representing pilots COPA (the Canadian Owners and Pilots Association, a group representing airplane owners and pilots), aviation safety (SMS Aviation Safety Inc.), the Canadian civil aviation authorities (Transport Canada and Nav Canada), and a wind energy consulting engineering firm (Genivar). The report was produced with the intent of being used by policy makers, industrial wind turbine project developers, and pilots to manage the risks imposed on aviation by industrial wind turbines. I have permission to use this report to help in promoting aviation safety and have attached the report to this response.

Regarding safety around wind turbines in freezing weather and icing conditions, I have reviewed the “GE Power and Water, Technical Documentation, Wind Turbine Generator Systems 1&2MW Platform, Safety Manual” which is included in the public docket for the OPSB Application for Seneca Wind and can be easily found online. The safety manual considers icing a “special danger” and states “it is advisable to cordon off an area around the wind turbine generator system with the radius R^* during freezing weather conditions, in order to ensure that individuals are not endangered by pieces of ice thrown off during operation. $R^* = 1.5 \times (\text{hub height [m]} + \text{rotor diameter [m]})$ (Recommendation of the German Wind Energy Institute DEWI 11/1999).”

1-10) Identify any witnesses, including expert witnesses, you plan to have testify on your behalf. For each witness (including expert witnesses), please provide a resume or statement of qualifications of the witness(es), identify the subject matter regarding which the witness will testify, and identify and provide any exhibits the witness will refer to or introduce.

None are planned at this time. However, I reserve the right to call witnesses at a later date.

1-11) Are you asserting that the Project will negatively impact your property value? If so, provide copies of any appraisals or other valuations that have been conducted for such property within the last ten years.

I do not own property in the vicinity of the project. However, I do assert that the project will negatively affect the property value of my parents' property, both monetary and the intrinsic value.

1-12) Identify any communications, written or otherwise, you have had with units, officials, and/or representatives of local, state, and/or federal governments or agencies concerning the Project.

a) For any written communications, provide a copy of the communication; and

I have submitted statements to the Deuel County Board of Adjustment and made verbal statements during the Project permitting process. My submittals can be found on the docket maintained for that hearing by the Deuel County auditor.

b) For any unwritten communications, provide the date of the communication, the persons involved, and the subject matter of the communication.

None that I am aware of.

1-13) In the last five years, how often have you visited South Dakota? Of those visits, how many times did you use aircraft as transportation?

In the last five years, I have visited South Dakota numerous times per year (exact numbers unknown). My wife, children, and I love spending time in South Dakota enjoying the beautiful area I grew up in. We come back to South Dakota often for family birthdays and

get-togethers, holidays and vacation days, and spending time on our family's property hunting, canoeing, hiking, camping, gardening, watching wildlife, and enjoying nature in the peace and quiet. In the past 5 years, I believe I've only flown to South Dakota 1 or 2 times. We look forward to flying much more often in the future because of the availability of our airstrip.

1-14) What locations in South Dakota have you visited in the past five years?

This question is overly broad. We have visited too many locations to list them all. Most of our time is spent at our family's property in Deuel County (Section 32, Township 116, Range 47; Section 20, Township 116, Range 48; Section 15, Township 116, Range 49) and Watertown, Clear Lake, Gary, Lake Cochrane, Pierre, Rapid City, and the Black Hills.

1-15) How many times in the past five years you have landed an aircraft in South Dakota and, of those times, how many landings were at the Clear Lake Airport?

In the past 5 years, I believe I've only flown to South Dakota 1 or 2 times, and I have not landed at the Clear Lake Airport.

1-16) Describe any ownership interest you have in, or right to use, a personal aircraft.

As a private pilot, I can rent single engine land airplanes from any Fixed Based Operator or other rental company following a basic checkout procedure with their instructor. I currently am a member of and use airplanes from the Duluth Flying Club in Duluth, Minnesota. I have been considering buying an airplane or entering into a shared ownership for the past few years, since it has been a life goal of mine to own an airplane since I was young. I have also been considering buying a powered parachute or ultralight aircraft for use at our airstrip. I love South Dakota and I love flying and I can't think of many things more enjoyable than flying over that countryside in an open cockpit ultralight or parachute.

1-17) Describe any interest you have in Homan Steel Construction, Inc. ("Homan Construction") or the W1/2 Section 32-116-47, Glenwood Township, Deuel County, South Dakota ("Glenwood Property")

I have no ownership interest in Homan Steel Construction.

1-18) In your January 15, 2019 comment to the PUC, you state that your “family is currently constructing a 2,350 foot long turf runway, named Homan Field, on the western half of section 32 in the Glenwood township of Deuel County” (“Private Landing Strip”). With respect to the Private Landing Strip:

a) What is the intended use of the Private Landing Strip?

The airstrip is intended to serve operations ranging from ultralight aircraft up to 4+ seat general aviation airplanes. The airstrip is intended to be used by myself, my family and friends, and public use will be allowed with prior approval. The construction and operation of the airstrip is also intended to provide a benefit to South Dakota and the general aviation community in the form of a charted navigational aide and, more importantly, a safe landing site in the event of an in-flight emergency.

b) You state that turbines on the northeast side of the proposed Private Landing Strip have been removed and “This allows for a one-sided traffic pattern to be flown without flying over any wind turbines, except turbine number 108 which is under the margin the FAA standards establish on the far side.” i) What FAA standards are you asserting apply?

My comments submitted to the docket contain clarifying information:

What is the traffic pattern airspace required in order to use Homan Field? Since the Deuel Harvest North Wind project layout has changed since the Special Exception Permit approval, wind turbines to the northeast of Homan Field have been removed by the developer. This allows for a one-sided traffic pattern to be flown without flying over any wind turbines, except turbine number 108 which is under the margin the FAA standards establish on the far side of the runway. The dimensions of the traffic pattern airspace for Homan Field, as defined by FAA standards established in FAA order JO 7400.2L, are 1.5 nautical miles (1.73 statute miles) from each end and the east side of the runway and .25 nautical miles (.29 statute miles) from the west side of the runway. Figure 2 [attached at the end of my response] illustrates the airport environment around Homan Field superimposed over a section of the project layout map. The yellow dashed line illustrates the traffic pattern airspace boundary.

ii) Is turbine location No. 108 the only turbine location you assert will interfere with the Private Landing Strip? If not, please explain.

My comments submitted to the docket contain clarifying information:

What are safe setback distances from wind turbines for general aviation operations? The expert panel reviewed the available research and addressed numerous potentially catastrophic risks associated with wind turbines, as obstacles for low flying aircraft and sources of wake turbulence and wind shear. The expert panel made recommendations for minimum setback standards for industrial wind turbines near airports and airstrips should include:

- **a restriction on constructing wind turbines within the distance equal to 7-10 rotor diameters from the runway or approach surfaces and**
- **the area of land under the traffic pattern airspace is free of wind turbines.**

In Figure 2 [attached at the end of my response], red lines are used to show the a 10x rotor diameter setback from the runway and approach surfaces. As shown above, the wind turbines numbered 106, 107, 108, 117, 123, and 124 from the application layout maps do not meet the recommended setback standards for wake turbulence and wind shear and therefore pose a substantial risk to serious injury or death for those flying into or out of Homan Field.

- c) You include a discussion of and figure showing approach surfaces. What regulations are you asserting establish these surfaces for the Private Landing Strip?

My comments submitted to the docket contain clarifying information:

Title 14 of the Code of Federal Regulations Part 77 defines the federal regulations for the Safe, Efficient Use, and Preservation of the Navigable Airspace. The standards used to define approach surfaces for runways are defined per section 77.19. An approach surface is applied to each end of each runway based upon the type of approach available or planned for that runway end. For Homan Field, a preliminary assessment of the approach surfaces shows the approach surfaces are sized as follows. The inner edge of the approach surface is the same width as the primary surface and it expands uniformly to a width of 1,250 feet. The approach surface extends for a horizontal distance from the ends of the runway of 5,000 feet at a slope of 20 to 1. In Figure 2 [attached at the end of my response], purple lines sketch the dimensions for the approach surfaces.

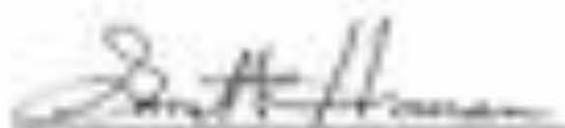
- d) What experience, education and training do you have regarding wake turbulence and wind shear?

As a private pilot, I have received training on the basis of aircraft make instructions and wind shear and the significant effects they can have on flight safety and the importance of avoidance. As an aerospace engineer, I have a Bachelor's of Science in Aerospace Engineering and a basic professional understanding of aerodynamics and fluid dynamics.

- c) Provide any correspondence to or from the Federal Aviation Administration regarding the Private Landing Strip.

I have included a figure I had sent to the FAA showing the proposed location details during the permitting process (attachment included below). I no longer have the text email.

On 2/25/19



Grant Hansen

Inspector

5401 Maple Grove Road

Hamersville, OH 43021

gphansen@gmail.com

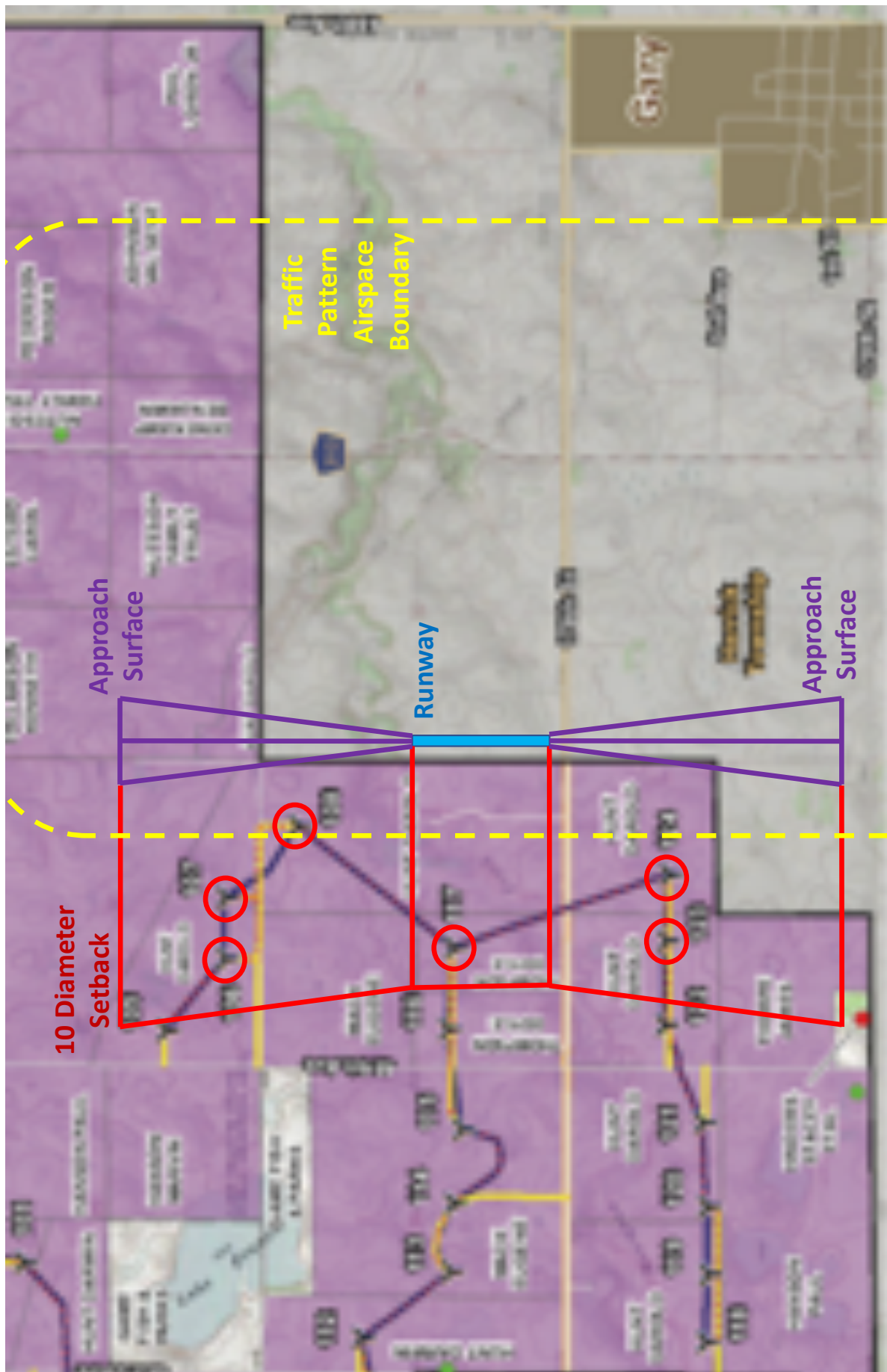


Figure 2 from My Public Comments



Attachment Sent to FAA During Airstrip Permitting Process



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WIND TURBINES REPRESENT POTENTIAL HAZARD TO PILOTS

March 26, 2009

By Ian J. Twombly

Wind turbines have the potential to be a hazard to air navigation, according to two new letters AOPA issued recently. While AOPA recognizes the role wind turbines play in green power generation, it is concerned that their tall construction could lead to potential collisions with aircraft and impact the reliability of radar.

AOPA made the comments in opposition to a bill in the Washington State legislature and on a request for comments to a wind farm proposed in Nantucket Sound off the coast of Massachusetts.

According to Greg Pecoraro, AOPA vice president of airports and state advocacy, "It has become increasingly important for AOPA to educate lawmakers across the country about the effects of these systems on aviation. Particularly so when the wind farms are in close proximity to airports," he said. "Aside from the obstruction itself, they can also interfere with communication and navigation, and wind patterns for all aircraft, especially gliders."

Pecoraro made the comments in his letter on Washington H.B.1008, a piece of legislation

that would regulate the installation and operation of wind turbines in the state.

"If the systems were to be installed near arrival or departure paths of these facilities, the safety of passengers and crew, as well as citizens below, would be severely compromised," Pecoraro said.

AOPA also is working on a high-profile wind farm issue off the other coast, in Nantucket Sound. This proposal caused political fireworks a few years ago when residents of the upscale islands opposed the clean energy source. Aesthetics aside, AOPA said there are serious aviation considerations as well.

Responding to the FAA's request for comments on the wind farm as a potential hazard to air navigation, AOPA said the proposed 130 wind turbines that cover a 35-square-mile area of the sound would cause a significant hazard to air navigation.

"The area of significant concern to AOPA is the high volume of low-altitude VFR flights between Barnstable Municipal, Martha's Vineyard, and Nantucket Memorial Airport," AOPA said.

The letter went on to say that the wind farm would impact radar coverage in the area, making it unlikely pilots would be able to receive flight following and other radar services over the water at lower altitudes.

The association will continue to monitor the wind turbine situation in Washington, Massachusetts, and around the country.

Ian J. Twombly

Ian J. Twombly is senior content producer for AOPA Media.

[GO TO IAN J. TWOMBLY'S PROFILE >](#)

From: Bernard Gervais bgervais@copanational.org 
Subject: SMS/COPA Report
Date: January 29, 2019 at 10:40 PM
To: garhoman@gmail.com
Cc: Kevin Elwood kelwood@copanational.org

BG

Mr. Horman,

Please feel free to use the SMS/COPA report for the purposes you see fit in the name of science and flight safety. If you could please cite the source when you mention material coming from it, it would be appreciated.

Best of luck!

Regards,

Bernard Gervais, PMP

Président - COPA - President & CEO

To advance, promote and preserve the Canadian freedom to fly

Faire progresser, promouvoir et préserver la liberté canadienne de voler.



Canadian Owners and Pilots Association
Association canadienne des pilotes et propriétaires d'aéronefs
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**BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF SOUTH DAKOTA**

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WIND ENERGY LLC FOR A PERMIT
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**STAFF’S FIRST SET OF DATA
REQUESTS TO INTERVENORS**

EL18-053

Below, please find Staff’s First Set of Data Requests to Intervenor. Please submit responses within 10 business days, or promptly contact Staff to discuss an alternative arrangement.

- 1-1) Provide copies of all data requests submitted to or by you and copies of all responses provided to those data requests. Provide this information to date and on an ongoing basis.
- 1-2) Refer to SDCL 49-41B-22.
 - a. Please specify particular aspect/s of the applicant's burden that you intend to personally testify on.
 - b. Please specify particular aspect/s of the applicant's burden of proof that you intend to call a witness to testify on.
- 1-3) Refer to SDCL 49-41B-25. Identify any “terms, conditions, or modifications of the construction, operation, or maintenance” that you would recommend the Commission order. Please provide support and explanation for any recommendations.
 - a. Specifically, what mitigation efforts would you like to see taken if this Project is constructed.
- 1-4) Please list with specificity the witnesses that you intend to call. Please include name, address, phone number, credentials and area of expertise.
- 1-5) Do you intend to take depositions? If so, of whom?

Dated this 12th day of February 2019.

Amanda M. Reiss

Amanda M. Reiss
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