

**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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**INTERVENOR GARRETT HOMAN’S
REBUTTAL TESTIMONY**

EL18-053

I, Garrett Homan, would like to respond so a few items brought up in John Thurber’s pre-filed testimony.

Decommissioning:

I agree with the Staff and Deuel Harvest’s work to reach an escrow agreement that protects for a much higher decommissioning cost than what Deuel Harvest originally estimated in their application. I believe that will help to reduce the financial risk of decommissioning this project. However, there are still logistic issues that need to be addressed in the decommissioning of this project – the most significant is where will these 336 wind turbine blades go when they are removed? This will have long lasting effects on the community if it is not addressed prior to approving the project.

The blades of the GE 2.3-116 model are approximately 191 ft long and the blades of the GE 2.82-127 are approximately 209 ft long. To put this in perspective, the blades are about as long as the wingspan of the Boeing 747 jumbo jet (195-224 ft wing span, depending on the variant). There are about 534 Boeing 747 jumbo jets in service around the world at this time (March 2019). There are 336 blades being proposed in this project (3x 112 turbines), or approximately 2/3s of the Boeing 747 wings world-wide will be used for this project alone. And that’s assuming the blades will never have to be replaced before the end of the project, which there is no guarantee won’t happen. They may need to be replaced multiple times over the life of the project. The blades themselves cannot be scrapped, salvaged, or recycled – they have to go in a hole in the ground somewhere, and they’ll never decompose. That’s a lot of garbage – too much garbage!

The decommissioning analysis states that the blades will be cut into manageable sizes and hauled to a “local landfill.” This is quite concerning, since no landfills have been identified by Deuel

Harvest as able or willing to accept this amount of garbage! What landfills are even “local” to the Project? The landfills closest to the Project are in Watertown, Brookings, and Day County. Does all of this waste have to go there? What happens if, in 30 years, no landfills will take the blade waste? Where does it go? Will Deuel County need to build mountains out of fiberglass that will never decompose or disappear. Will the turbines just be left standing? How does this not affect the local environment or welfare of the county?

Additionally, the decommissioning analysis provides no specific details relating to how or where the almost 23,000 gallons of used oil will be disposed at the end of the project’s life. What local landfills can take on that much oil? For example, the Watertown Regional Landfill explicitly states they do not accept waste oil. How often do the turbines require oil changes – how many gallons of oil will need to be disposed of over the life the Project and where will that go?

There are too many questions and not enough answers surrounding the decommissioning of this project. Burns and McDonnell Engineering have never managed or executed a wind farm decommissioning project, and very few wind farms have actually been decommissioned or demolished to date. Has Invenergy had any experience with decommissioning wind farms? How are we to believe Deuel Harvest has any idea what the decommissioning will actually entail and that it won’t affect the environment or the community? Specifically, regarding decommissioning, Deuel Harvest has not met their full burden to prove that the Project 1) will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the area, 2) will not substantially impair the health, safety or welfare of the inhabitants, and 3) will not unduly interfere with the orderly development of the region. I sincerely request that the Commission adds a condition requiring a full, detailed decommissioning plan, with landfill agreements in place, prior to approving the project permit.

Turbine Layout Changes:

I strongly support the Staff’s request that Deuel Harvest produce a final turbine layout as soon as possible. This layout is necessary to determine if the project application meets all burden of proof requirements, that the project (1) will comply with all applicable laws and rules; (2) will not pose a threat of serious injury to the environment nor to the social and economic condition of inhabitants or expected inhabitants in the area; (3) will not substantially impair the health, SAFETY or welfare of the inhabitants; and (4) will not unduly interfere with the orderly development of the region. Without a final turbine layout it is impossible for the Parties and the Commission to determine if all requirements are met. Providing this most basic project

information this late in the process imposes a significant burden on all parties in limiting time to prepare before the Evidentiary Hearing.

Safe setbacks from private airstrip - Homan Field:

The turbines located at 106, 107, 108, 117, 123, and 124 do not meet aviation and wind energy industry experts' recommendations for safe distances from runways or approach surfaces (see COPA / SMS report provided as GH Exhibit B). I have not requested that these turbines must be REMOVED from the Project, only from their locations. Removal is an option, but the turbines could also be moved to a different area within the project to accommodate the developer's business plans. To that point, I've previously identified over 20 other locations within the project boundaries that appear to be able to accommodate additional turbines, and there are entire areas within the boundaries with no turbines where these could be moved. If Deuel Harvest chooses to meet their burden of proof regarding safety, it would be possible to move these turbines elsewhere. If they choose not to meet their burden of proof regarding safety, then the Commission should deny the Project permit.

As to how I have determined what an appropriate setback from Homan Field is, I feel there is confusion about this, and I would like to attempt to clarify. I have not calculated these distances from a vacuum, I have relied on the succinct recommendations coming from an independent, third-party safety-risk assessment of the issue that included aviation safety experts, regulatory authorities, piloting advocacy groups, and wind turbine engineering consultants to provide these setbacks for safety. I am attaching to this testimony, the previously submitted COPA / SMS Report No. 1101 "Aviation Safety-risk Assessment of The Effect of Wind Turbines on General Aviation Aircraft." This was not admitted to the docket on my first attempt because the file name did not include "confidential" in it. I have corrected that mistake and am submitting it again, as GH Exhibit B. I have permission to use this report for these proceedings, see previous GH Exhibit C.

This report is directly applicable to the issue at hand; it was written with the explicit purpose of being used as a reference when considering the safe siting of wind turbines in proximity to public and private airports, since so little experience and precedent exists. The report's executive summary explains its purpose as:

"The recent growth of the wind energy industry across Canada caused the Canadian Owners and Pilots Association (COPA) to commission a multi-phased independent safety

analysis of the effect of wind turbines on general aviation (GA) aircraft. The first phases of the study involved studying technical and operational literature to identify aviation hazards, so that a panel of subject matter experts from the aviation and wind energy industries could assess the associated safety-risks.

This report summarizes the results of the expert panel meeting held in Ottawa on February 10 – 11, 2011. It is intended to be used by government policy makers, wind farm developers and GA pilots to manage the aviation safety-risks associated with the interaction of GA aircraft with wind turbines.

The deliberations of the Expert Panel focused on the physical hazards of wind turbine structures (i.e., wind turbines as obstacles to aircraft operating at low altitudes, and the potential effect of towers on ground-based navigation aids) and on the effects of the rotating blades of the wind turbines (i.e. turbine-induced turbulence, blade-tip vortices and wind shear).”

This expert panel concluded, on page 22 of the report, regarding safe setbacks from non-certified “aerodromes” (parlance for private airstrips in Canada):

“GA [general aviation] aircraft are most exposed to risks relating to wind turbines when aircraft fly at or below the height of wind turbines – most often during take-off and landing.

The panel determined that to reduce the risk to GA [general aviation] aircraft when operating from non-certified aerodromes, an adapted form of obstacle limitation surfaces should exist. This could be achieved through regulatory standard or policy. Based on the available information, the panel determined that the following criteria would be appropriate:

- An area extending 2.5 km from both ends and at least one side of the aerodrome’s runway in which there are no obstacles higher than 45 m⁴⁸;
- A restriction on constructing wind turbines within 7-10 rotor diameters from the approach surfaces⁴⁹; and

- The area of land under the aerodrome traffic pattern (or circuit) is free of wind turbines⁵⁰. Non-standard circuits can be specified to minimize turbulence based on the prevailing wind direction, among other factors⁵¹.”

I have attempted to simplify the above criteria in my pre-filed testimony as:

“• 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.”

I have used these recommendations in all of my proceeding set back requests. I have not claimed that the FAA regulations and policies from 14 CFR 77 and JO 7400.2L apply directly as law to private airstrips. However, in the absence of other industry accepted methods for determining *approach surface and traffic pattern airspace geometries*, as referenced in the expert recommendations above, 14 CFR 77 and JO 7400.2L provide the accepted standards in the US and they are the most appropriate to use here. Physics are physics after all, and pilots are trained to fly airplanes in a certain manner, so these fundamental aspects of aviation (specifically traffic patterns and approach surfaces) are germane to every runway regardless if public or private or mandated by law or not. To assume differently would be irrational and ignorant of aviation fundamentals. Additionally, no other standards for determining traffic pattern airspace or approach surfaces have been proposed in this manner (because these are the de factor standards).

On line 5 of page 17, Mr. Thurber states that “In addition, the DOT Aeronautics Office does not regulate setbacks of private airstrips.” That may be true at face value, but that doesn’t mean that South Dakota doesn’t address the safety of private airstrips in any way. Please refer back to my pre-filed testimony regarding SDCL definitions of “airport” and the creation or establishment of “airport hazards.” Additionally, it is important to note that the Project does not ONLY have to comply with all applicable laws and rules, but it also must also not substantially impair the health and safety of inhabitants. These are two distinctly different burdens, and the Applicant must prove that the Project meets both. Even if there are no direct South Dakota DOT or FAA laws regulating wind turbine setbacks from airports, that doesn’t mean that airports in close proximity to wind turbines are safe. Put another way, meeting the burden of proof that the Project complies with all applicable laws and rules regarding private airstrips does not also prove that the project will not impair the health and safety of users of those private airstrips. The issue of safety is one

that must be determined using an understanding of physics, aviation practices, and pilot training. To do otherwise would be negligent.

Having our own airstrip on the property has been a dream of ours for quite a long time. My father and I have been discussing the airstrip for at least 20 years. Since it was first discussed with Grabow Construction in 2013, my father has been planning the construction details for at least 6 years. Regarding the potential use of Homan Field, that is not limited to me alone. Both of my children have expressed interest in becoming pilots when they are old enough. My father and I both have friends that are pilots that we would welcome to use the airstrip. Because of the nature of my business, I have many current and previous coworkers that are pilots that we would welcome to use the airstrip. And additionally, my father and I have discussed allowing others to use the airstrip to fly in for hunting or other outdoor activities on the property. Anyone would be able to use the airstrip, as long as they attained permission ahead of time. Also, since the aviation community is quite committed to safety, private airstrips are generally available to the public as a potential landing site in the case of emergencies, and so will this one.

Finally, in regards to precedents of setbacks from private airstrips and this not being litigated before the Commission previously, both the Applicant and the Commission have an opportunity and an obligation to ensure that this project will not impair the health or safety of inhabitants. Failure to provide appropriate safety margins away from an airport's runway(s) and approach surfaces will impair the safety of any users, as evident from the COPA / SMS expert panel's recommendations. Whether the airport is public or private is not germane to this issue.

Ice Throw:

Regarding the GE documentation supporting the 1,100 ft safety distance for ice throw. In response to my data requests, Deuel Harvest has confirmed the document I referred to as "GE Power and Water, Technical Documentation, Wind Turbine Generator System 1&2MW Platform, Safety Manual" does apply to the turbine models in the application. Further, Deuel Harvest responded that they have submitted a "Safety Manual" to the Staff under Attorney's Eyes Only. I sincerely request that the Staff and Commission thoroughly review that document for concurrence with my requests for setbacks to maintain safety in the event of ice contamination. You will find that the calculations I have provided regarding safety zones around turbines in icing conditions are accurate and are even recommended by the manufacturer when ice detections systems are used (because those systems can't eliminate the risk). Furthermore, the Safety Manual I have referenced is publicly available on the Ohio Seneca Wind Public

Docket at the following web address: <https://senecawind.spower.com/wp-content/uploads/2018/10/Seneca-Wind-Appendix-G.pdf>. As such I am resubmitting it as GH Exhibit F to this testimony.

Respectfully,

Date 3/31/19



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