

**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**

*
* **INTERVENOR GARRETT HOMAN’S TES-**
* **TIMONY REGARDING THE DEUEL HAR-**
* **VEST WIND ENERGY PROJECT**
*
* **EL18-053**
*
*

My name is Garrett Homan. My family and I currently live at 5669 Maple Grove Road in Hermantown, Minnesota. I am providing testimony on the following topics:

- A. The Project’s impact on aviation safety
- B. The Project’s failure to adequately protect from ice throw
- C. The Project’s risks associated with turbine fires
- D. The Project’s risks associated with pollution

My parents are John and Teresa Homan, and they own property in the vicinity of the Deuel Harvest Wind Energy Project being proposed. I grew up in Watertown but spent most of my free time working, hunting, and enjoying the outdoors at the family farms in Deuel County. I have always enjoyed spending time in the outdoors, everything from hiking, camping, canoeing, hunting, skiing, snowshoeing, bird watching, gardening, and wildlife and habitat conservation. My wife does as well, and sharing the love of the outdoors with our two children, particularly at our family’s farms, has become a large part of our life.

I am currently employed as a Certification Project Engineer at an aircraft development company named Joby Aviation. I hold a Bachelors of Science in Aerospace Engineering from Iowa State University, which I received in 2006. I have worked in the aerospace industry since graduating, primarily on the design and FAA certification of small aircraft.

I am a private pilot with around 150 hours total time, and I am near completing my instrument rating. I am permitted to fly small, single engine airplanes, and most of my experi-

ence has been in models such as the Piper Warrior, Piper Archer, Cessna 172, Cirrus SR20, and Cirrus SR22. I am a member of the Duluth Flying Club which gives me easy access to renting a number of small aircraft.

A. The Project's Impact on Aviation Safety

The Project as proposed does not comply with SDCL 49-41B-22 (3), which states the applicant has the burden of proof to establish that the facility will not substantially impair the health, safety or welfare of the inhabitants.

Related to aviation safety, I will discuss how the project as proposed does not account for 1) the hazards presented to users of our family's airstrip, 2) compliance to SDCL chapter 50 regarding creating hazards for public and private airstrips, and 3) various other known potential hazards to aviation safety that were not addressed by the Application's Aviation Study.

1) The Project as proposed will create a substantial threat of serious injury or death to users of our family's airstrip, and the Application does not address any impacts to my family's airstrip in section 20.4.2.2 Air Traffic.

Our 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. There are wind turbines sited in close proximity to the airstrip that will create significant risks to my life and the lives of my family, friends, and any other pilots that use the airstrip. The associated risks are not only from the turbines being dangerous obstacles to flight at low altitudes and during critical phases of flight but also because of the unsafe wake turbulence and wind shear effects that affect the safe use of airspace above my family's property, the runway, and the approach and departure paths.

The Applicant has been fully aware of our airstrip for quite some time, since they had been active in opposition to our airstrip during numerous Deuel County Board of Adjustment meetings where the Special Exception Permit for our airstrip was discussed at length. In addi-

tion, the Applicant has been aware of our concerns regarding the safety of users of our airstrip. During the Special Exception Permit hearing for the Deuel Harvest Wind Projects, I spoke and submitted a written statement on these very concerns. However, the Board never expressed any interest in hearing my concerns, nor did they ask any questions to educate themselves on the issues. The Application acknowledges the Special Exception Permit for our airstrip, however section 20.4.2.2 Air Traffic, which is included to "address the potential impacts of the proposed Project on air traffic" conveniently omits our airstrip. Therefore, the Applicant does not fully meet their burden of proof to establish that the facility will not substantially impair the health, safety or welfare of the inhabitants. I sincerely ask the Public Utilities Commission to not dismiss my concerns as both the Applicant and the Deuel County Board of Adjustment has; the turbines close to our airstrip present a very real threat of serious injury or death.

To explain a bit more about about our airstrip: Homan Field is a private-use airport consisting of one 2350 ft (long) x 100 ft (wide) grass surface runway oriented north/south (runway 36/18). The runway is located in section 32 and is centered at 44°48'33.80" N, 96°29'55.75"W. Refer to Exhibit A Figure 1 for runway layout. Construction is currently underway, but has been paused due to frozen ground during winter. Construction is intended to be completed this spring. Operations are planned to range from ultralight aircraft up to 4+ seat general aviation airplanes (e.g. Cessna 182, Cirrus SR20, etc.). Public use will be allowed with prior approval from the airport owner. The construction and operation of Homan Field Airport provides 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. Notice of approval to establish a private use airport from the FAA was signed on June 12, 2017 for Homan Field. The special exception permit to construct a private airstrip (Homan Field Airport) in an Ag District was approved by the Deuel County Board of Adjustment on September 11, 2017.

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 ap-

proval, 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 7400.2M, 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. Exhibit A Figure 3 is provided from JO 7400.2M as reference. Exhibit A Figure 2 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.

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 Exhibit A Figure 2, purple lines sketch the dimensions for the approach surfaces.

Research has shown that industrial wind turbines create wake vortex turbulence and wind shear downwind of them. The Applicant knows this because it is wind industry practice to account for these issues when siting turbines, because the wake turbulence and wind shear from upwind turbines affects the performance and structural fatigue life of downwind turbines. In addition, I have provided one representative research paper Wind Turbine Wake Aerodynamics (Vermeer, 2003) as Exhibit D. But what effects does this have on the safety of low flying aircraft in and around the project area?

Some aerial applicators, who are commercial pilots highly experienced in flying at low altitudes and close to obstacles, are refusing to fly in and around wind turbines due to the significant risk they pose as obstacles and because of wake turbulence and wind shear effects. I spoke with one aerial applicator, Denny Meyer from Steier Ag Aviation in Whittemore, IA, that has experienced severe turbulence from flying downwind of turbines stating it will “shake the hell out of you.” He has since decided his family company will not operate in or around wind farms due to the significant risk they pose to the safety of him and his sons who operated the business. Spray planes are more heavily wing loaded than the small general aviation airplanes or ultralight aircraft that will fly into and out of our airstrip, so they are less affected by turbulence. If wind turbines “shake the hell” out of a spray plane, what would they do to an ultralight flown by a less experienced pilot? A similar experience could easily be catastrophic.

Please refer to the SMS Report No. 1101, Aviation Safety-risk Assessment of the Effect of Wind Turbines on General Aviation Aircraft (SMS / COPA, 2011), which I have provided as Exhibit B with permission to use as Exhibit C. The SMS / COPA report 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 - exactly the use case we are discussing now. 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 Exhibit A Figure 2 red lines are used to show the a 10x rotor diameter setback from the Homan Field runway and approach surfaces. 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. In Exhibit A Figures 5-8, I have identified 26 possible alternate sites (green circles) for the 6 turbines not meeting the SMS / COPA proposed setbacks from our runway and its approach surfaces (red circles). Also, it's evident from the maps themselves that there are more possible alternate sites.

2) Wind turbines in close proximity to my family's airport will create a hazard and as such do not meet South Dakota Codified Law chapter 50 Aviation and 50-10 Airport Zoning which provides protection to private airports by preventing the creation of hazards to landing and taking off.

SDCL 50-1-1 defines "Airport" as "any area of land or water used, or intended to be used, for landing and take-off of aircraft, and any appurtenant area, structure, facility, or right of way to facilitate that use. The term includes any military airport, private airport, public airport, and temporary airport."

SDCL 50-10-1 defines "Airport hazard" as any structure, or tree, or use of land, which obstructs an aerial approach of such an airport or is otherwise hazardous to its use for landing or taking off."

SDCL 50-10-2 defines "airport hazards as danger to life and property. It is hereby found that an airport hazard endangers the lives and property of users of the airport and of occupants of land in its vicinity, and also, if of the obstruction type, in effect reduces the size of the area available for the landing, taking off and maneuvering of aircraft, thus tending to destroy or impair the utility of the airport and the public investment therein. It is hereby declared:

(1) That the creation or establishment of an airport hazard is a public nuisance and an injury to the community or the United States served by the airport in question; and

(2) That it is therefore necessary in the interest of the public health, public safety, and general welfare that the creation or establishment of airport hazards be prevented.”

Therefore if a structure or use of land would be hazardous to the use of a private airport for its landing or taking off, SDCL states it is a danger to life and property and that the creation of such structure or establishment of such use of land must be prevented in the interest of health, safety, and general welfare.

Section 3.2 of the SMS / COPA report summarizes how wind turbines constitute hazards to general aviation aircraft, including:

- 1) Physical Obstacles to Aircraft Flying at Low Altitudes
- 2) Wind Turbine Induced Turbulence
- 3) Wind Turbine Blade-tip Vortices
- 4) Wind Shear Caused by Wind Turbines
- 5) Interference with Signals generated by VOR Navigation Aids

Section 4 of the SMS / COPA report provides strategies to mitigate the hazards, which includes Minimum Setback Distance Standards. Again, The expert panel recommended these standards 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.

Therefore, in order to prevent the creation of hazards to Homan Field airstrip, and abide by South Dakota Codified Law, the Applicant should move or remove turbines in the vicinity of the airport to meet the expert panel’s recommended setback criteria. In addition, in the name of aviation safety, I feel this criteria should be universally adopted for any other private or public airports in or near the Project and also be adopted for all other in work or future wind energy projects in South Dakota.

3) The Applicant does not fully meet their burden of proof in that the Aviation Study does not address all aspects of aviation safety that will or may be affected by the project.

The applicant's aviation study included in the application docket does not address all the impacts wind turbines have on aviation and the navigable use of airspace. The applicant's aviation study does not mention wind shear, wake turbulence, or safety effects of wind turbines that occur downwind. If these issues have not been researched and found to be positively safe with respect to existing airports and airstrips, with objective evidence to such, then the Applicant has not met their burden. The FAA regulations are *minimum* requirements, and the state or local municipalities may impose more stringent requirements to promote safety. The Project should be required to address all known and potential impacts to aviation safety, not just the minimums required by Federal law.

The scope of the Aviation Study was limited to how wind turbines may effect airspace as obstacles only. Again, wake turbulence and wind shear downwind from turbines are well known issues, and the developers account for those effects on turbine performance and fatigue life for downwind turbines. But the applicant did not address their effects on aviation safety in or around airports. Clear Lake Airport (FAA identifier 5H3) is in close proximity to the project boundaries as well (.56 nautical miles). How will wake turbulence and wind shear affect Clear Lake Airport?

Also, the Aviation Study states that electro-magnetic interference (EMI) effects on aviation communication and navigation systems was not addressed. What are the effects this wind energy project could have on aircraft communications and navigation, which are both critical to safe flying? How will the project affect the reception of VOR navigation aids in the area (such as Watertown VOR identifier ATY, Redwood Falls VOR identifier RWF)?

What about other aspects of aviation that are not covered by the applicants Aviation Study? How will this project affect the ability of helicopter ambulances to respond to emer-

gencies in or around the project area? What risks are presented when the turbine lighting fails and is not fixed in a timely manner? An inoperative obstruction light on a wind turbine near Highmore, SD, contributed to a catastrophic accident that resulted in four fatalities in 2014, all because of a burned out lightbulb not being fixed. The risks associated with constructing wind turbines around airports and the effect they can have on navigation and airspace are real and very severe.

B. The Project Fails to Adequately Protect from Ice Throw

The Project as proposed does not provide an adequate level of safety to the public or neighbors from “ice throw”, or chunks of ice that are shed from spinning turbine blades during freezing weather conditions. The project as proposed does not comply with 49-41B-22 (3) since the minimum setbacks used for siting do not meet the wind turbine manufacturer’s (GE) recommendations for the required safety distances surrounding turbines in freezing weather to mitigate hazards associated with ice throw. This puts the safety of neighbors and the general public using roads at risk.

In support of this claim, I am submitting evidence from the Seneca Wind Farm project public docket currently under review in Ohio as Exhibits E and F.

To expand upon my background, I was previously employed at Cirrus Aircraft for over 10 years as a Mechanical Systems Engineer and Engineering Manager responsible for the development and FAA certification of ice protection systems on general aviation aircraft and the FAA approval of general aviation aircraft to safely operate in icing conditions. I was also appointed as a company Designated Engineering Representative of the FAA which meant the FAA acknowledged I had adequate experience to approve ice protection and icing related designs on their behalf. As such, I have knowledge of and previous experience relating to atmospheric icing, ice accretion physics, and their effects on airfoils and aircraft.

The Seneca Wind Farm Application to the Ohio Power Siting Board made in July 2018 is provided here as Exhibit E. It is relevant to the Deuel Harvest Wind project in that both

Projects propose one identical GE turbine model and another from the same 2MW platform. The Seneca Wind Farm project proposes GE turbine models GE 2.3-116 and GE 2.5-127 (see page S-2 of Exhibit X). And the Deuel Harvest Wind Application is proposing to use GE turbine models GE 2.3-116 and GE 2.82-127. The Seneca Wind Power application includes “Appendix G Turbine Safety Manual” entitled “GE Power and Water, Technical Documentation, Wind Turbine Generator Systems 1&2MW Platform, Safety Manual” (herein referred to as the Safety Manual) provided here as Exhibit F.

On page 5 of the Safety Manual, GE states “The safety manual must be read and understood by the operating and maintenance personnel and the *owner*, in order to guarantee safety in and on the wind turbine generator system and to prevent accidents and personal injuries. ... The basic rules of conduct for safe working in and on the WTG are described in this safety manual.”

On page 44 of the Safety Manual, GE states “Ice build-up on wind turbine generator systems (WTG) and, in particular, the shedding of ice from rotor blades can lead to problems if wind turbine generator systems are planned in the vicinity of *roads, car parks or buildings at locations with an increased risk of freezing conditions*, unless suitable safety measures are taken.”

On page 45 of the Safety Manual, GE 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)”

Freezing weather conditions are common in Deuel County during the fall, winter, and spring months, so the probability of turbines encountering icing conditions is very high. As stated in the Safety Manual “ice will form more quickly on blades than nacelles” which current ice accretion research explains is due to speed and geometry effects so even if an ice detector is installed on the turbine there still is a risk of icing being present on the blades and not trig-

gering the detectors (the application does not state if the turbines proposed will include ice detection systems). For background, atmospheric icing conditions can exist whenever moisture of any kind is present and static air temperatures are below or even slightly above freezing. And ice can build on structures moving through an air mass, or an air mass moving over structures, when icing conditions are present. This is a well known condition in aviation due to the significant safety concerns associated with ice accretions on aircraft.

How do the proposed Deuel Harvest Wind project setbacks compare to the GE recommended safety distances “to ensure that individuals are not endangered by pieces of ice thrown off during operation”? They do not meet the manufacturer’s recommendations.

Table 8-2 from the Application provides specifications for the wind turbine models, from which *R for the two models can be easily calculated:

$$*R = 1.5 \times (\text{hub height [m]} + \text{rotor diameter [m]})$$

$$*R_{\text{GE2.3-116}} = 1.5 \times (80 \text{ m} + 116 \text{ m}) = 294 \text{ m} = 965 \text{ ft}$$

$$*R_{\text{GE2.82-127}} = 1.5 \times (88.6 + 127) = 323 \text{ m} = 1061 \text{ ft}$$

The Project setbacks from property lines and the public right of way are a *minimum* of 110% of turbine height per Deuel County zoning ordinances section 1215.03. For the GE 2.3–116 model, that *minimum* setback distance is 497 feet. For the GE 2.82-127 model, that *minimum* setback distance is 549 feet. As one can see, both of these minimum setback distances do not meet GE’s safety manual recommendations, and therefore the Project as proposed does not adequately protect the public or neighbors from the risks of ice throw, which can lead to property damage, serious bodily injury, or even death. Bear in mind, per GE’s own safety manual, the turbine owner and operator must read and abide by the safety manual recommendations, however the Applicant does not currently comply with those safety recommendations.

C. The Project’s risks associated with turbine fires

The Project Application does not address the risk of fires associated with industrial wind turbines, which poses a serious threat to the safety and welfare of inhabitants in the vicin-

ity of the Project. Wind turbine fires are not uncommon in wind farms, as a simple Google news search will show, and as reported in Overview of Problems and Solutions in Fire Protection Engineering of Wind Turbines (Uadiale, 2014) which is provided as Exhibit G.

As reported by Uadiale, “The fire problem in wind turbines arises as a result of large amounts of highly flammable materials (hydraulic oil and lubricants, composite materials, insulation, and polymers) contained within the nacelle of the wind turbine and packed in close proximity to potential ignition sources such as overheated mechanical components (hot surfaces) and electrical connections that could fail. Once a fire is ignited in a wind turbine, the situation rapidly escalates because the high wind favoured by turbine locations enhances the supply of oxygen and, hence, the fire growth. In over 90% of wind turbine fires reported, a total loss of the wind turbine, or at least, a severe structural failure of the major components (blades, nacelle, mechanical or electrical components) has been reported. Moreover, even in the case of rapid detection, the fire brigade cannot intervene because of the turbine height, and for off-shore wind turbines it is impractical to send response teams to fight the fire. Under high wind conditions, burning debris from the turbine may fall on nearby vegetation and start forest fires or cause serious damage to property.”

See Exhibit H for recent evidence of wind turbine fires spreading to the ground. In March 2018, a burning wind turbine caused a grass fire near Weatherford, Oklahoma, as reported by KOKH (<https://okcfox.com/news/local/photos-wind-turbine-catches-fire-sparks-grass-fire-in-western-oklahoma>):

“WEATHERFORD, Okla. (KOKH) — A wind turbine caught fire, causing a grass fire Wednesday in western Oklahoma.

Oklahoma Forestry Services reports that on March 28 a wind turbine two miles south of Weatherford caught fire, throwing sparks to the ground.

The sparks caused a grass fire that was contained after growing to approximately five acres. Eight fire engines responded to the scene and were able to contain the fire.”

In August of 2018, a wind turbine caused a wildfire that burned 2,000 acres near Arlington, Oregon, as reported by KATU (<https://katu.com/news/local/wind-turbine-sparks-fire-in-arlington>):

“ARLINGTON, Ore. — A wind turbine caught fire Thursday, sparking a 2,000-acre wildfire, according to the North Gilliam Rural Fire Protection District.

The turbine was on Rattlesnake Road and, according to firefighters, the fire jumped Highway 19, closing the road.

Firefighters got the fire out but not before two railroad bridges were burned.

No evacuations were needed.”

It's easy to understand how a multi-thousand-acre ground fire could be disastrous in Deuel County, with all the crop land, pasture, natural grass land, and tree belts and groves covering the Project area. It is very likely in dry, windy conditions (think harvest time), a fire of this magnitude could destroy farms and homes and kill livestock and people. It could clear out a section mile or more very quickly, destroying everything in its path. In the case of the Weatherford, OK, fire, eight fire engines were on hand ready to contain the fire when it spread to the ground. But that's not a guarantee in Deuel County. The nearest fire departments to the Project are Clear Lake, Brandt, Gary, and Goodwin, and all are *volunteer* fire departments without any special equipment allowing them to fight a fire 290 feet in the air. So even if the volunteer fire fighters arrived before a turbine fire had to the ground, they would have no option but to wait and watch for sparks to fall to ground until the turbine fire burned itself out. This wait and see strategy alone poses a considerable risk to property and life since there would be no guarantee of catching it in time. And once it grew to the size of a prairie fire, there's no quick stopping it. In the case of the Arlington, OR, fire it burned 2,000 acres without endangering people, but that's not necessarily the case for Deuel County where numerous homes and buildings exist in and in close proximity to the Project layout. It's terrifying to think about how quickly a fire like that could grow to an unmanageable size and the damage it could do. The

Application doesn't even address the risk of fire and therefore doesn't meet the burden of proof regarding the project's impact on health, safety, and welfare of inhabitants.

D. The Project's Risks Associated with Pollution

The Applicant addresses pollution associated with the project in a number of places in the application, however it fails to address pollution due to oils and fluids leaking from the turbines during operation. Last December, my family and I drove through a wind farm near Kensett, IA, and we were shocked and appalled at the flagrant pollution associated with some time of oil (assumed to be hydraulic fluid, but not certain) leaking out of operating wind turbines (none were shut down). Out of around 100 turbines in the branch of the wind farm we drove through, we counted about 10 that were visibly leaking oil and still operating - 1 in 10. The leaks were not minor either, in that oil stains covering the nacelles, the top of the tower, and streaming out the span of the blades could easily be seen from the road. I have included pictures of some of the leaking turbines in Exhibit H. It's easy to understand that these would be large volumes of oil and that the oil doesn't just evaporate but would run down, be blown, or flung off of the turbines contaminating the local surroundings.

It's also easy to understand that since 1 in 10 turbines were showing evidence of significant leaks, the probability of some rare event causing this issue distributed across miles of a wind farm is unrealistically low. Rather, this would seem to be a somewhat normal operating condition associated with wind turbines.

The application does not include sufficient details to understand what fluids, oils, or other chemicals may be present in the turbines and the toxicity or environmental impact of those materials if they were to leak into the soil, ground water, or vegetation, especially on a seemingly normal basis. Even if only a very rare occurrence, which the evidence would say otherwise, how will the Applicant address the ecological impacts of this pollution? Also, what are the fire risks associated with oil leaks like this? The Application also does not address the probability of leaking fluids during operation or the corrective action necessary to reverse the

impacts to the local environment and ecosystem - there is nothing like a Spill Prevention, Control, and Countermeasure plan provided for the project.

This source of pollution is not addressed in the application sections relating to the effects on soil resources, ground water, surface water, ecosystems, and wildlife. As such the applicant does not fully meet their burden of proof that the Project as proposed will not pose a serious injury to the environment or impair the health, safety, or welfare of the inhabitants.

That concludes my testimony at this time.