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Ohio Power Siting Board
180 E. Broad St.
Columbus, Ohio 43215- 3793

Black Fork Wind Energy, LLC
Element Power US, LLC
Case # 10-2865-EL-BGN

Testimony of Thomas Allen Karbula Sr.

Dear Ohio Power Siting Board,

My issuses with this case are as follows,

(Exhibit A, Staff Report of Investigation, pg 24, item 22)

"No significant adverse impacts to public or private water supplies are anticipated due to construction or operation of the Black Fork Wind Farm." My concern with this anticipation of damage is, what immediate corrections will be made to my well supply if it is contaminated on a Friday afternoon, or any contaminations in general?

(Exhibit B, Staff Report of Investigation, pg 25, item 26)

"Noise impacts from construction activities would include the operation of various trucks and heavy equipment. Impacts from construction noise would be temporary and would be primarily restricted to daylight hours." My concern with this item is, what if the construction crew has issues during the day and is required to work through the night to fix the issue. This item says nothing of possible malfunctions in daily progress, and does not guarantee that work will stop completely at dark.

(Exhibit C, Staff Report of Investigation, pg 27, Site Selection)

Paragraph 1, line 3 states, "The Applicant began researching the desirability of installing a wind project in the state, evaluating prospective development sites against the following criteria: renewable energy demand, wind resource quality, transmission availability, land availability, land use compatibility, environmental constraints, interest from land owners, and community acceptance." Not once, did Element Power approach myself, on or off my property, and ask me if I liked the idea of having a wind turbin anywhere located near my residence. Now, Black Fork Wind Energy wants to put 4 wind turbins in various places close to my residence. I have no inclination whatsoever of having any wind turbins even visible from my property.

(Exhibit D, Staff Report of Investigation, pg 29, Aesthetics)

Paragraph 3, line 2 states, "Screening the turbines from view is not a practical mitigation measure as the project area is predominantly open land used for agriculture, and visual impacts would be unavoidable." I thoroughly enjoy sitting outside in the morning to drink my coffee, and even more so, sit outside in the evening to watch the sun setting. Now with a future plan of installing wind turbins near my residence, at a distance of no more than 1700 feet from my yard, and to add that they want to install 4 of them, I have no option whatsoever to look at a gigantic eye sore at any given time of the day or night!

(Exhibit E, Staff Report of Investigation, pg 33, Roads and Bridges)

Paragraph 2, line 1 states, "Wind farm construction equipment is expected to impact local roads." Even though there are two intersections making Solinger Rd. accessible, what if some of the construction equipment breaks down in front of my driveway, or tears up the road so bad that I am not able to drive my personal Mack truck/mobile welding rig out to welding jobs? Is Element Power going to pay my projected weekly, or monthly wage, that fluctuates on a daily basis, until the road is fixed?

(Exhibit F, Staff Report of Investigation, pg 34, Operational Noise)

Paragraph 3, line 1 states, "The noise impact of the wind farm also depends on the existing ambient noise level of the project area." Just because a 1,250 foot buffer area is put around these turbins, there is no proof or guarantee that a temperature or any weather change will eliminate the noise acoustics from reaching my residence.

(Exhibit G, Staff Report of Investigation, pg 35, Shadow Flicker)

Paragraph 4, lines 1 and 2 state, ""Realistic" conditions based on the turbines' operational time, operational direction, and sunshine probabilities were used to calculate a realistic amount of shadow flicker to be expected at each shadow receptor. The Applicant simulated shadow flicker from the proposed turbines out to one kilometer (3,280 feet)." The said named turbines, 85, 86, 87, 88, are all going to be completely visible from my residence. I'm including four pictures of the areas where these turbins are to be located. Turbin #86 I have labeled as (Exhibit G1). Turbin #85 I have labeled as (Exhibit G2). Turbin #88 I have labeled as (Exhibit G3). Turbin #87 I have labeled as Exhibit G4. The furthest turbine is roughly estimated to be 1,700 feet from the center of my property from your provided maps. How many flicker hours over 30 per year will my residence receive?

(Exhibit H, Staff Report of Investigation, pg 36, Local and Long Range Radar Interference)

Paragraph 1, line 1 states, "Wind turbines can interfere with civilian and military radars in some scenarios." With the interference stated, who's to say that all cellular service and reception at my residence will be eliminated? I use my cell phone to run my business from my home, primarily, and will not stand for interruptions to make a daily living!

(Exhibit I, Staff Report of Investigation, pg 47, Public Notice)

Paragraph 1, line 2 states, "A copy of the accepted, complete application in this proceedings was duly served upon." The various parties listed to receive this notice were all around my residence. My home town library, Crestline Public Library, did not receive this notice. I was not notified that any copies of this notice were available to me to view at any time from any of the surrounding recipients or my own township.

Exhibit A pg 24, item 22

lucifugus), and Northern long-eared bat (*Myotis septentrionalis*). E&E also indicated that the big brown bats and Northern long-eared bats were the most common captured, that there were lactating females captured for all five species, and juvenile bats were captured for all species, except for the Eastern red bat. Based on this information, OPSB Staff and the ODNR believe take of these species is likely to occur and recommend that the Applicant conduct post-construction monitoring in accordance with ODNR-approved, standardized protocols. If it is determined that significant mortality, as defined in ODNR's approved, standardized protocol, has occurred, then a mitigation plan will be required to reduce the risk of mortality to bats.

(iii) Other Mammals: This project lies within the known range of the black bear (*Ursus americanus*) a state endangered species, and the bobcat (*Lynx rufus*), a state endangered species. Due to the mobility of these species, the project is not likely to have an impact on these species.

(e) Aquatic Species: This project lies within the known range of the state endangered and federal candidate rayed bean mussel (*Villosa fabalis*). Due to the project type, location, construction methods, and lack of suitable habitat for this species within the project area, the ODNR and the USFWS have concluded that no impacts to this species would be expected.

(20) The Applicant has performed a preliminary review of the geology of both Crawford and Richland counties. At this time, there does not appear to be any geological conditions present that would restrict or constrain the construction of the facility in the designated project area. However, glacial tills that are more readily compacted are common throughout the project area and should be taken into account during the final design phase to incorporate soil characteristics and engineering qualities of site-specific soils.

(21) Elevated water tables may also pose a hazard to the excavation and construction of the foundation and may require implementing methods for groundwater extraction. However, the project would not alter any groundwater patterns or cause any significant or lasting impacts to the groundwater resources. Groundwater wells used for domestic water supplies should not be affected in any way during and after the construction of the wind turbines in the project area.

(22) No significant adverse impacts to public or private water supplies are anticipated due to construction or operation of the Black Fork Wind Farm.

(23) The Applicant has stated that turbines 25, 30, 42, 43, and 83 would be located within Zone A of the Federal Emergency Management Authority's 100-year floodplain, and would not increase the base flood elevation.

(24) All of the turbines under consideration cut-out[17] at wind speeds of at least 25 meters per second (m/s), or 56 miles per hour (mph). All proposed turbines are certified by the International Electrotechnical Commission that they are designed to withstand high wind speeds of at least 37.5 m/s or 84 mph.

[17] *Cut-out* wind speed refers to the wind speed at which a wind turbine ceases to produce energy.

Exhibit B pg 25, item 26

(25) The Applicant plans to install Vestas V100, GE 1.6-100, or Siemens SWT 2.3-101 wind turbines. The Applicant has addressed safety with respect to individual wind turbines and the project as a whole. The turbines selected by the Applicant would have a supervisory control and data acquisition (SCADA) system, gates along access roads to turbines, and locked tower doors. The project would include a substation with a locked security fence, transformer fire suppression system, a lightning protection system, and would comply with NFPA 70E standards and OSHA requirements. The Applicant has provided a copy of the manufacturers' safety manuals for Staff review.

(26) Noise impacts from construction activities would include the operation of various trucks and heavy equipment. Impacts from construction noise would be temporary and would be primarily restricted to daylight hours.

(27) The Applicant conducted baseline sound measurements at eight points within the Black Fork project area in order to estimate the actual ambient noise levels. Recorded ambient noise levels (L_{EQ})[18] across these eight points ranged from 49 to 58 decibels (dBA) during the day and from 38 to 52 dBA at night. The data provided equates to an average project area daytime L_{EQ} of 53 dBA and an average project area nighttime L_{EQ} of 43 dBA.

(28) In order to limit potentially high levels of sound to residents and other individuals, a 1,250-foot minimum separation distance was utilized by the Applicant when siting wind turbines.

(29) The Applicant states that the Vestas V100 turbine would not generate operational noise in excess of the ambient L_{EQ} plus five dBA at any non-participating receptor. The Siemens SWT 2.3-101 and the GE 1.6-100 turbines result in 20 and 52, respectively, non-participating receptors that would experience sound levels in excess of the ambient L_{EQ} plus five dBA. Certain environmental and atmospheric conditions can further propagate or amplify noise levels.

(30) The Applicant's "realistic"[19] shadow flicker simulations identified 17 non-participating receptors modeled to receive 30 hours or greater per year of shadow flicker. The receptors exposed to greater than 30 hours per year are not identical across turbine technologies/layouts. The maximum predicted shadow flicker impact at any receptor is approximately 66 hours, 55 minutes per year. The maximum at any non-participating receptor is 55 hours, 16 minutes per year.

(31) Television stations most likely to produce off-air coverage to Crawford and Richland counties are those at a distance of 40 miles or less. Specific impacts to TV reception could include noise generation at low channels in the very-high frequency (VHF) range within one-half mile of turbines, and reduced picture quality. Signal loss could occur after construction and the Applicant proposes to mitigate accordingly. However, the transition to digital signal has reduced the likelihood of these effects occurring.

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[18] LEQ refers to the equivalent continuous sound level, or average sound level, over a specific period of time.

[19] "Realistic" simulations take into account turbine operational time and local sunshine probabilities. They do not take into account any blocking or shading effects attributable to structures or trees, which would likely lessen the exposure amounts.

Exhibit C pg 27, Site Selection

Considerations for ORC Section 4906.10(A)(3)

MINIMUM ADVERSE ENVIRONMENTAL IMPACT

Pursuant to ORC Section 4906.10(A)(3), the proposed facility must represent the minimum adverse environmental impact, considering the state of available technology and the nature and economics of the various alternatives, along with other pertinent considerations.

Site Selection

The Applicant received a waiver from providing a comprehensive site selection study due to specific requirements of a wind-powered electric generation facility. As an alternative, the Applicant provided a general discussion that addressed the factors deemed necessary for a viable wind project and illustrated the process by which the project was micro-sited within the project area. The Applicant began researching the desirability of installing a wind project in the state, evaluating prospective development sites against the following criteria: renewable energy demand, wind resource quality, transmission availability, land availability, land use compatibility, environmental constraints, interest from land owners, and community acceptance. Statewide wind resource data was evaluated to identify areas with sufficient wind resources to launch a commercially viable generation project. Abundant wind resources, agricultural land, and available transmission interconnections were discovered in Richland and Crawford counties. Additionally, Colorado-based energy developer, Gary Energetics, had already initiated preliminary technical and environmental studies and secured lease agreements from land owners for the construction of a wind farm in the area. Having identified this project site as promising for wind generation, the Applicant acquired the Black Fork Wind Farm from Gary Energetics. The project area had thus already been established prior to acquisition of the project and no other regional sites were considered.

Additional factors were considered in the siting of individual wind turbines, collection lines, and access roads within the project area. The Applicant installed three additional meteorological towers in March, April, and May 2009 to measure wind resources in the project area. The wind data from these towers was used to predict electric production from potential turbine locations, using various turbine models. The Applicant identified and implemented setback requirements for residences, property lines, public rights-of-way, and other features. Additionally, the Applicant evaluated visual effects, ice throw, blade shear, shadow flicker, impacts to local fauna, flora, and wetlands, as well as effects on local roads, cultural resources, and agricultural lands. Collection lines were sited using the following criteria: circuit length, property right availability, and the absence of environmental constraints. Access roads were sited to avoid or minimize crossing wetlands, streams, and forested areas, as well as to minimize loss of agricultural land.

Collection Line System

The Applicant is proposing to place all collection lines underground, minimizing impacts to waterways and aesthetic impacts. However, Staff does not find the collection system between turbines 30 and 44 running to turbine 57 to represent minimal adverse impacts. This portion of line runs nearly four miles between the nearest turbines, across agricultural fields. Staff recommends that the Applicant design a system to incorporate these lines into the western portion of the project, bundled with other proposed collection corridors.

Exhibit D pg. 29, Aesthetics

would be 1.5 miles from the park. While visible from some areas of the park, forested zones would act as natural screening, reducing the visual impact of the wind project. Noise impacts and shadow flicker are not expected to impact park visitors.

Cultural and Archaeological Resources

The Applicant has identified 27 historic structures, six archaeological sites, and six OGS-listed cemeteries within the project area for the facility. The Applicant asserts that each of the identified sites was considered and all facility components have been sited to avoid them. Additionally, the Applicant determined that the indirect visual impact from the project would not alter or affect the qualities or attributes that contribute to the historical or architectural significance of each identified landmark or NRHP-listed and NRHP-eligible structure. The Applicant has noted that although mitigation options are limited due to the nature of the project, they have considered and incorporated mitigation options to reduce the visual impacts. Examples of such mitigation include screening, uniform turbine design, and turbine color to blend with the sky at the horizon. Additionally, the Applicant continues to work independently with the Ohio Historic Preservation Office to ensure that no additional impacts to archaeological resources would occur.

Aesthetics

The Applicant conducted a view-shed analysis, considering topography and project structure heights, to determine the visibility of the turbines within a five-mile radius of the project area. No vegetative or structural screening was accounted for in the study. Based on this analysis, the Applicant estimates that one or more wind turbines would be visible from most vantage points within the study area. The Applicant provided photomontages representing three prominent views of the project from major road intersections. As depicted in these images, several project turbines would be completely or partially visible from these locations.

Wind turbines would be visible from recreational use areas, cultural landmarks, and area residences. The project area is predominantly open land used for agriculture, making vegetative screening impractical. Furthermore, due to the height of the wind turbines, the Applicant is required to implement a Federal Aviation Administration (FAA) lighting plan, in which red flashing lights are placed atop the nacelle of several turbines to assure safe flight navigation through the area. When complying with FAA lighting requirements, the Applicant will install the minimum number of lights at the minimum intensity required by the FAA to diminish potential visual impacts.

The project is expected to have a long-term aesthetic impact on residences near the facility. The facility would be visible from many of the residences in the project area. Screening the turbines from view is not a practical mitigation measure as the project area is predominantly open land used for agriculture, and visual impacts would be unavoidable.

Economics

Construction of the project would result in $290 to $400 million in spending. Between $51 and $69 million of total construction costs would be spent within the region on equipment, materials, labor, site preparation, and associated development costs.

The facility would have a direct and indirect economic benefit to the region during construction and operation of the project. Construction employment would vary each month. Total construction employment is estimated to be between 70 and 95 on-site workers, with an

Exhibit E pg. 33, Roads + Bridges

Because local emergency responders would likely be unfamiliar with addressing emergencies related to wind turbines, the Applicant would meet with local emergency personnel to provide training and review site-specific risks prior to construction.

The electric collection system for the wind farm would be buried four feet underground. By law, anyone with underground facilities must be a member of a one-call system such as the Ohio Utilities Protection Service (OUPS). The OUPS establishes a communication link between the wind farm owner and individuals planning any digging activity. The owner of the buried facilities is required to mark underground lines before any digging or excavation work begins.

Roads and Bridges

The Staff is waiting to review the final route study to determine the roads used for delivery, road conditions, and obstructions.

Wind farm construction equipment is expected to impact local roads. The pavement condition of state, local, and county thoroughfares along regional delivery routes could be damaged by construction and material delivery equipment, particularly dump truck and concrete truck traffic. Some modifications to local roads would be needed, including the expansion of intersection turns to accommodate specialized turbine component delivery vehicles and conventional construction trucks.

All intersections in the area would need improvements to accommodate the oversized/overweight vehicles for turbine delivery from the manufacturer. These trucks require minimum clearances due to their size and turning radii. There does not appear to be any significant construction challenges such as steep grades, existing structures, or significant clearing with the proposed improvements. Improvements and associated impacts would need to be reevaluated during the final engineering process to determine the best solution for each intersection. Clearing of vegetation, relocating traffic signs, grading of the terrain, extension and/or reinforcement of existing drainage pipes and/or culverts, re-establishment of a ditch line if necessary, and construction of a suitable roadway surface to carry construction traffic must be addressed for each public roadway.

Construction Noise

Noise impacts from construction activities would include the operation of various trucks and heavy equipment. The Applicant provided estimates of sound levels associated with operation of this construction equipment. Although the Applicant intends to use BMPs for noise abatement during construction, many of the construction activities would generate significant noise levels. However, Staff believes that the adverse impact of construction noise would be minimal because it is temporary and intermittent, it would occur away from most residential structures, and most construction activities would be limited to normal daytime working hours.

Operational Noise

The Applicant retained Resource Systems Group, Inc. (RSG) to conduct noise studies of potential impacts from operation of the facility. RSG utilized DataKustic GmbH's Cadna/A® computer noise modeling software to perform acoustic modeling. Cadna/A® computes calculations using international standard ISO 9613-2 for industrial sources. RSG analyzed the 1/1 and 1/3 octave bands to develop the wind turbine sound estimates. The Applicant provided data that equates to average nighttime L_{EQ} of 43 dBA.

Exhibit F pg 34, Operational Noise

Some atmospheric conditions can also further propagate or amplify sound. Two examples are wind shear and temperature inversions. Wind shear occurs when the winds aloft near the top of the wind turbine are moving faster or in a different direction than the wind near the ground. Wind turbulence, or wakes from adjacent turbines, can also create wind shear. This shear can result in aerodynamic modulation, a rhythmic noise pattern, or pulsing, which occurs as each blade passes through areas of different wind speed/direction.

A temperature inversion occurs most often when the ground cools off quickly, while the air above the ground remains warm. As the temperature increases with height, the speed of sound also increases with height. This means that for a sound wave traveling close to the ground, the part of the wave closest to the ground is traveling the slowest, and the part of the wave farthest above the ground is traveling the fastest. As a result, the wave changes direction and bends downwards. This downward refraction of sound helps to further propagate otherwise attenuated sound.

The noise impact of the wind farm also depends on the existing ambient noise level of the project area. An acoustic survey of the project area was conducted between June 3 and 11, 2009. Eight survey locations were acoustically sampled. Recorded ambient noise levels (L_{EQ}) across the three points within the Black Fork project area ranged from 49 to 58 dBA during the day and from 38 to 52 dBA at night. The data provided equates to an average project area daytime L_{EQ} of 53.8 dBA and an average project area nighttime L_{EQ} of 43 dBA.

In order to limit sound levels to residents and other individuals, 1,250-foot buffer areas were utilized by the Applicant when siting wind turbine generators.

The Applicant utilized an operational sound output of 48 dBA at all non-participating receptors as a design goal. The Vestas V100 turbine meets this goal. The Vestas turbine would not result in operational increases to the ambient L_{EQ} by greater than five dBA at any non-participating receptor. However, the Siemens SWT 2.3-101 and the GE 1.6-100 turbines do not meet this goal. They result in 20 and 52 non-participating receptors that would experience exceedances of this level, respectively.

A 2001 New York State Department of Environmental Conservation (NYSDEC) document[22] states that "in non-industrial settings the noise level should probably not exceed ambient noise by more than 6 dBA at the receptor. An increase of 6 dBA may cause complaints. There may be occasions where an increase in noise levels of greater than 6 dBA might be acceptable." The NYSDEC recommends that, while it may be acceptable in some non-industrial settings, an increase in ambient noise levels of greater than 6 dBA warrants further study of potential impacts.

The Vestas V100 layout presents the minimum adverse acoustical impact to non-participating residents within one-mile of the project area.

Shadow Flicker

The Applicant used WindPRO to calculate how often and in which intervals a specific receptor could be affected by shadows generated by one or more wind turbines. The calculation of the potential shadow impact at a given shadow receptor, defined as a one-meter square area located

[22] NYSDEC. (February 2, 2001). *Assessing and Mitigating Noise Impacts* (p. 14). Albany, New York. Retrieved from the NYSDEC Web site: http://www.dec.ny.gov/docs/permits_ej_operations_pdf/noise2000.pdf

Exhibit G pg 35, Shadow Flicker

one meter above ground level, is carried out by simulating the environment near the wind turbines and shadow receptors.

The position of the sun relative to the turbine rotor disk and the resulting shadow is calculated in time steps of one minute throughout a complete year. If the shadow of the rotor disk, which in the calculation is assumed solid, at any time casts a shadow on a receptor, then this step is registered as one minute of potential shadow impact. These calculations took into account the wind turbine location, elevation, and dimensions, and the receptor location and elevation.

A wind turbine's total height and rotor diameter were included in the WindPRO shadow flicker models. The taller the turbine, the more likely shadow flicker could have an effect on the local receptors, as the longer shadow has greater potential to reach beyond obstacles such as trees or hills. The larger the rotor diameter, the more area on the ground could be affected by shadow flicker. Dimensions for the wind turbine models proposed for the Black Fork Wind Farm, as used for this study, are shown below.

Turbine Model	Rated Capacity (MW)	Hub Height (M)	Rotor Diameter (M)	Blade Tip Height (M)
Siemens SWT 2.3-101	2.3 MW	80/99.5	101	131/150.6
Vestas V100	1.8 MW	95	100	145
GE 1.6-100	1.6 MW	100	100	150

The Vestas V100 turbine creates the most shadow flicker impact to receptors. The Vestas turbine would expose 17 non-participating receptors to greater than 30 hours per year. The GE 1.6-100 turbine creates the least shadow flicker impact to receptors. The GE turbine would expose 13 non-participating receptors to greater than 30 hours per year.

"Realistic" conditions based on the turbines' operational time, operational direction, and sunshine probabilities were used to calculate a realistic amount of shadow flicker to be expected at each shadow receptor. The Applicant simulated shadow flicker from the proposed turbines out to one kilometer (3,280 feet). Shadow flicker beyond one kilometer from a turbine in northern latitudes such as Ohio can occur seasonally at sunrise and sunset when lower sun elevation angles occur. No state or national standards exist for frequency or duration of shadow flicker from wind turbine projects. However, international studies and guidelines from Germany and Australia have suggested 30 hours of shadow flicker per year as the threshold of significant impact, or the point at which shadow flicker is commonly perceived as an annoyance. This 30-hour standard is used in at least four other states, including Michigan, New York, Minnesota, and New Hampshire. Accordingly, the Applicant and Staff utilized a threshold of 30 hours of shadow flicker per year for their analyses.

Additional screening factors such as trees and adjacent buildings were not considered within the "realistic" analysis. The same is true for receptors expected to receive greater than 30 hours of shadow flicker exposure. If additional screening were modeled, this could result in lower shadow flicker exposure amounts and possibly reduce receptors above 30 hours per year to below that threshold.

Shadow flicker frequency is related to the wind turbine's rotor blade speed and the number of blades on the rotor. Shadow flicker at certain frequencies may potentially affect persons with

Exhibit H pg 36, Local + Long Range Radar Interference

epilepsy. For about three percent of epileptics, exposure to flashing lights at certain intensities or to certain visual patterns may trigger seizures. This condition is known as photosensitive epilepsy. The frequency or speed of flashing light that is most likely to cause seizures varies from person to person. Flashing lights most likely to trigger seizures are between the frequency of 5 to 30 flashes per second or hertz (Hz).[23] This project's maximum wind turbine rotor speed translates to a blade pass frequency of approximately 0.8 Hz[24] and therefore would not be likely to trigger seizures.

As modeled, the GE 1.6-100 turbine presents the minimum adverse shadow flicker impact to non-participating residents within one-mile of the project area.

Communication Interference

Off-air television stations transmit broadcast signals from terrestrial facilities. The signals can be received directly by a television receiver or house-mounted antenna. Television stations most likely to produce off-air coverage to Crawford and Richland counties are those at a distance of 40 miles or less. Specific impacts to TV reception could include noise generation at low channels in the very-high frequency (VHF) range within one-half mile of turbines, and reduced picture quality. Signal loss could occur after facility construction and the Applicant proposes to mitigate accordingly. However, the transition to digital signal has reduced the likelihood of these effects occurring.

The Applicant states that the facility will not impact radio, television, and other communication services in the project area, and that the facility has been sited to avoid known tower structures in the project area. The Applicant does not offer mitigation for these towers should an impact occur. However, the Applicant proposes coordination and mitigation if any unanticipated impacts to television or AM/FM radio reception were to occur. Mitigation could include offering television hookups, where a cable system is available, or direct broadcast satellite TV reception systems to those affected.

Microwave telecommunication systems are wireless point-to-point links that communicate between two antennas and require clear line-of-sight conditions between each antenna. The Applicant identified 10 microwave paths intersecting the project area. Based upon the calculated worst-case scenario, no proposed turbine locations are expected to obstruct the identified microwave paths. The Applicant concluded that no potential for microwave interference exists for the turbine locations considered within the application.

Signal blockage caused by the wind turbines would not degrade the wireless telephone network because of the way these systems are designed to operate. If the signal cannot reach one cell, the network design allows it to be able to reach one or more other cells in the system. As such, local obstacles are not normally an issue for wireless telephone systems.

Local and Long Range Radar Interference

Wind turbines can interfere with civilian and military radar in some scenarios. The potential interference occurs when wind turbines reflect radar waves and cause ghosting (false returns) or shadowing (dead zones) on receiving monitors. Radar interference thus raises national security

[23] Epilepsy Foundation of America. Retrieved Dec. 21, 2009, from Epilepsy Foundation Web site: http://www.epilepsyfoundation.org/about/photosensitivity/

[24] Vestas V100 1.8 MW turbine (16.6 RPM = 0.27 Hz x 3 blades = 0.8 Hz)

Exhibit I pg 47, Public Notice

Considerations for ORC Section 4906.10(A)(6)

PUBLIC INTEREST, CONVENIENCE, AND NECESSITY

Pursuant to ORC Section 4906.10(A)(6), the Board must determine that the facility will serve the public interest, convenience, and necessity.

Public Notice

Pursuant to the procedure set forth in the Ohio Administrative Code, an application for a certificate of environmental compatibility and public need must be served upon the local government officials and planning commissions and must be sent to the local public libraries of communities affected by the proposed project.[28] A copy of the accepted, complete application in this proceeding was duly served upon the Richland and Crawford county commissioners, the Crawford County Economic Development Partnership, the Richland County Regional Planning Commission, and the Auburn, Jackson, Jefferson, Sandusky, Vernon, Richland, Plymouth, Sandusky, and Sharon township trustees on June 17, 2011. A copy of the application was sent to the Bucyrus, Galion, Mansfield-Richland County (Main and Ontario branches), and Marvin Memorial (Shelby, OH) libraries on June 17, 2011 as well.

Upon acceptance of a complete application, the Board or an Administrative Law Judge will schedule one or more public hearings.[29] The Administrative Law Judge in this case scheduled a local public hearing for Thursday, September 15, 2011 at 6:00 PM at the Shelby Senior High School in Shelby, Ohio, and an adjudicatory hearing for Monday, September 19, 2011 at 10:00 AM at the offices of the Public Utilities Commission in Columbus, Ohio. By entry dated June 22, 2011, the Administrative Law Judge directed the Applicant to issue public notice of these hearings in newspapers of general circulation in the project area.[30] The public notice for these hearings appeared in the *Mansfield News Journal* and the *Bucyrus Telegraph Forum* on June 30, 2011. The Applicant submitted proof of publication on July 19, 2011.

Public Interaction

An application for a certificate of environmental compatibility and public need must include a description of the Applicant's public interaction programs.[31] According to the Applicant, company representatives have been meeting with local government officials as well as participating landowners since 2010. The Applicant has maintained an official community presence since that time and plans to open a local office near the project area to help further communications with project stakeholders during facility construction.

The Applicant hosted a public informational meeting on December 16, 2010, to provide project information to the general public and to answer any questions about the project.[32] Notice of the meeting appeared in the *Mansfield News Journal* and the *Bucyrus Telegraph Forum* on December 7, 2010.[33] According to the Applicant, almost 200 people attended the public meeting and many of the questions at the public meeting covered topics discussed in the certificate

[28] OAC 4906-5-06
[29] OAC 4906-7-07(C)
[30] OAC 4906-5-08(C)
[31] OAC 4906-17-08(E)(1)
[32] OAC 4906-5-08(B)
[33] OAC 4906-5-08(B)

Exhibit
G1

Turbin
#86

Exhibit
G2

Turbin
#85

Exhibit
G3

Turbin
88

Exhibit
G4

Turbin
87

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