BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct a Wind Electric Generation Facility and Associated Electric Facilities to be known as the Glacier Hills Wind Park, Located in the Towns of Randolph and Scott, Columbia County, Wisconsin	Docket No.6630-CE-302

INITIAL BRIEF OF THE COALITION FOR WISCONSIN ENVIRONMENTAL STEWARDSHIP

The Coalition for Wisconsin Environmental Stewardship ("CWESt") opposes the application of Wisconsin Electric Power Company ("WEPCO") for a certificate of public convenience and necessity ("CPCN") to construct a wind electric generation facility to be known as the Glacier Hills Wind Park ("Glacier Hills").

First, the project would be a threat to human health and safety because of wind turbine noise and shadow flicker.

Second, the project would substantially and unfairly reduce real property values.

The Commission may not issue a CPCN without first determining that the project would promote the public health and welfare. *Application of Wisconsin Electric Power Company for a Certificate of Public Convenience and Necessity to Construct a Wind Electric Generation Facility and Associated Electric Facilities, to be Located in Fond du Lac County*, Docket no. 6630-CE-294 (2007) (following *Clean Wisconsin, Inc. v. Public Service Commission of Wisconsin*, 2005 WI 93, ¶ 35).

The evidence shows that, rather than promote the public health and welfare, this project threatens it.

People like to dismiss the concerns of "neighbors" of wind projects as "NIMBYs." These turbines would not only be in our back yards, they would be in our front yards, our side yards, across our fields and our neighbors' fields, down our roads, and ALL AROUND us! This is not like living near a power plant or a transmission line. We will be living INSIDE an electric generating station.

Testimony of Jeffrey Bump,
Tr. SR9.9: 6-12

I joined the 82nd Airborne Division when I was 17 years old. Duty, honor, and country. I believe in those three terms. The utmost -- if I thought that in any way, shape, or form this would be good for this country, believe you me, I would be the first one to build one and put it in my yard.
...

I'm not against the farmers who want this for them, they're doing it for monetary reasons, money. The Friesland president just said we're not getting nothing, okay. Personally, I am going to have to move. When I got back from Iraq, I sleep about three, four hours a crack. Drive by my house, ask my neighbors, I'm up in the middle of the night, and it doesn't take a bump in the middle of the night to wake me up.

Turbines, does everybody hear how they describe these things, turbines. Jet engines are turbines. 1,500 horsepower tanks that I hear in the middle of the night bother me. That's all I ask. Put it in your yard, not mine.

Testimony of James Ebert,
Tr. 336:12-17, 337:12-25.

I. INTRODUCTION

A. CWESt

CWESt is a statewide grassroots organization of people concerned about the responsible placement of wind turbines. Its primary goal is to provide a central source for gathering and disseminating reliable information about industrial wind plant siting,

issues related to industrial wind turbines and the effects of turbines on residents. Members of CWESt include approximately 150 individuals living within, adjacent to, or in the vicinity of the proposed facility. Request to Intervene, PSC REF# : 113558, p. 2.

B. The Project Area

Glacier Hills would sit on approximately 17,350 acres of predominately agricultural land in the townships of Randolph and Scott in Columbia County. Final Environmental Impact Statement ("FEIS"), ex. 900, PSC REF# : 120688, p. XIII. The area would include "participating" landowners, who have agreed to host turbines on their property, and "non-participating" landowners, who have not agreed to host turbines. *Id.,* p. 95. A petition opposing the proposed project was presented to the Town of Randolph board. The petition was signed by 139 people. Tr., p. 210. The project is opposed by Neighbors Caring About Neighbors, a group with 232 members. *Id*., p. 238.

The Village of Friesland would lie entirely within the project footprint. FEIS., p. XII. The Village board adopted a resolution prohibiting the construction of wind turbines within 1 1/2 miles of the village limits. Ex. 902, p. 537. The village has also started the extra-territorial zoning process. *Id.*, p. 29. The Townships of Scott and Randolph executed joint development agreements with the applicant, but those agreements address the effects of the project on the "towns as a whole." FEIS, p. 6. Moreover, the Randolph agreement is silent with respect to noise and setbacks.

II. THE PROJECT WOULD GENERATE NOISE AT LEVELS DANGEROUS TO HUMAN HEALTH.

A. Turbine Noise is a Serious Problem for People Already Compelled to Live Inside Wind Electric Generation Facilities.

This is the third time the Commission has been asked to site a large-scale wind electric generation facility.[1] This is the first time, however, that a party has presented evidence of life within a facility. That evidence is directly relevant to what life within Glacier Hills would be like.

Gerald Meyer lives within the Forward Wind Energy Center. Meyer Tr. D9.16:20.

[1] The first time was the Forward Wind Energy Center. *Application of Forward Energy LLC for a Certificate of Public Convenience and Necessity to Construct a Wind Electric Generation Facility and Associated High Voltage Electric Transmission Facilities, to be Located in Dodge and Fond du Lac Counties,* Docket no. 9300-CE-100 (2005). The second time was the Blue Sky Green Field Wind Park, cited above.

Houses Inside the Forward Wind Energy Center. Ex. 807

In October 2008, in the Forward Wind Energy Center docket, Mr. Meyer complained to the Commission about serious problems with wind turbine noise. PSC REF#: 106317. Mr. Meyer repeated those problems at the technical hearing in this docket:

> I experience tension, anxiety, occasional headaches (which I rarely had before the turbines), and light-headedness. I also get an unusual feeling in the base of my neck, and I hear a crackling or hissing in my ears. I also experience nausea.
>
> From the sleep deprivation (some nights only getting two hours of sleep) I am concerned I will fall asleep while driving, even during the day. ...
>
> My son suffers from sleeplessness and headaches. He has described his headaches this way: "It feels like my head is spinning 100 miles an hour." He sleeps with one or two radios on to cover up the turbine noise. My wife experiences headaches, sleeplessness, and ringing (two octaves above middle C) or buzzing in her ears, along with rising blood pressure.

Meyer Tr. D9.17:14-18:3.

Mr. Meyer kept a diary, over a fifteen-month period, chronicling his family's struggle with wind turbine noise. Ex. 806, Meyer Tr. D9.17:3-5. The following are

representative entries:

> March 3- Turbine 4 turning slow for the first time. 10PM I went out to check the fire and I looked up in the sky to try and see the jet flying over. It was not a jet but the turbine.
>
> April 21- 6AM. The sound had been quiet over the weekend. Now it's [sic] back to it's irritating sound. 10: 30 PM can hear #73 like a train winding down the tracks.
>
> May 4 - Tonight turbine #73 and #4 seemed to be fighting with each other. …In my family room in the back of the house (56' long) I hear turbine #6 or #4. It is not the sound of a jet flying over or a whoosh, but more like hearing your heartbeat with a stethoscope.
>
> May 13 – 5:20 AM. At times #73 is loud like blasting in a stone Quarry. A loud pounding sound.

Meyer Tr. D9.19:13-23.

Kevin Gehring lives "right in the middle of the Butler Ridge Wind Turbine project." Gehring Tr. 261:12-14. He cautioned supporters of Glacier Hills to:

> be careful for what you ask for. I invite any of you to come, just don't drive by my house, but stay overnight with us and stay with us for a week and actually get to encounter the sound and the noise and everything that you hear with these.
> ....
> I can hear the turbines.… You can hear that whiney noise when you're reading books to your kid's in their bedroom at night.

Gehring Tr. 261:15-20, 262:14, 20-22.

James Mueller lives near turbines in the Town of Marshfield. Referring to the wind developer's assurance that the noise from a turbine is "no louder than a refrigerator running," Mr. Mueller testified: "Who in their house has a refrigerator in their bedroom?" Gehring Tr. 273:16-18.

Larry Wunsch lives inside the Forward Wind Energy Center. Wunsch Tr.

D9.13:6. Asked about the effect on his family, Mr. Wunsch replied: "It has taken away the quality of our lives." Wunsch Tr. D9.13:9. Mr. Wunsch recorded the sound of a turbine 1100 feet from his home, as heard from within his shed and the house of a neighbor. Wunsch Tr. D9.13:11-12. The recording is included in Ex. 804. The sound on the recording is like the sound of the jet engine Mr. Meyer thought he heard, a sound identified by other residents of wind electric generation stations. Ex. 806 *passim*; Mueller Tr. 274:16.

B. Wind Turbine Noise is a Threat to Human Health and Safety.

1. Scientific evidence shows the distinctive characteristics of wind turbine noise.

Richard R. James is an acoustical engineer. His work includes developing siting criteria for county and township governments, preparing pre-construction background sound studies, and conducting acoustical tests of operating wind turbines. James Tr. D9.23:4-6. James analyzed the sound study and other information submitted by the applicant. He also prepared a report on the health issues related to wind turbine noise and the criteria used for establishing setbacks. James Tr. D9.23:13-14. His testimony included the following general observations:

> --The information submitted to the commission by the applicant does not correctly or adequately describe the impact of the proposed project on the host community and the residents whose homes and properties are close to or within the footprint of the project.
>
> --The background sound levels used by the applicant's sound expert were obtained using a methodology that has been shown to result in a biased assessment of [sic] not adequately define the background sound levels and characteristics of wind turbine noise for purposes of making decision on location with respect to homes and properties.

> --Computer model estimates of operational sound levels from the proposed projects understate the impact of the turbines on the community.
>
> --Information provided supplemental to the background sound and computer modeling studies by Dr. Geoff Leventhal, and others, asserting that there is no research supporting a causal link between wind turbine sound emissions at receiving properties and homes and health effects do not reflect current understanding of thresholds of perception and mechanisms whereby such perception can occur.
>
> --The result of these technical flaws along with an outdated understanding of how the human body responds to acoustical energy previously consid*e*red to be below the threshold of perception leads to a conclusion that if the WEPCO project, as proposed, is approved, it will, with a high degree of certainty, have negative noise impacts that are "significant."

James Tr., p. D9.28-29.

According to James, wind turbine noise is experienced as more annoying than other sources of noise at the same or lower decibel level. Annoyance can start at sound levels of 10dBA or more below the level that would cause equivalent annoyance from other common noise sources:

> Whereas one would expect that people would be annoyed by 45dBA nighttime sound levels outside their homes in an urban area, rural residents are equally annoyed by wind turbines when the sound levels are 35dBA independent of the time of day.

Ex. 808, p. 5. "[T]he human body is more sensitive to infra and low-frequency noise (ILFN)" and "the organs of balance (vestibular) and cardio-vascular systems respond at levels of sound significantly lower than the threshold of audibility." Therefore, it is expected "that a substantial number of people who live near the Glacier Hills Wind project will complain that the noise level in experiences both causing nighttime sleep disturbance and creating other problems once operation commences." *Id*.

According to James, existing procedures for assessing pre-operational background

sound levels were designed for communities being considered for traditional power generation facilities, not wind electric generation facilities. The quiet soundscapes found in rural areas thought more suitable for wind developments "accentuate the perceived annoyance and potential for sleep disturbance." *Id.*, p. 10

Because of the importance of accurately measuring pre-construction ambient sound levels, James retained George Kamperman to independently assess those sound levels. Kamperman found that the background sound level measurements taken by WEPCO's expert, George Hessler, were flawed, because Hessler's measurements were taken near wind monitors, not at locations near resid*e*nts. *Id.* p. 11. James found this situation similar to one reported by Dr. Paul Schomer:

> Hessler's BP study for the Cape Vincent Wind Power Facility appears to have selected the noisiest sites, the noisiest time of year, and the noisiest positions at each measurement site. Collectively, these choices resulted in a substantial overestimate of the a-weighted ambient sound level, 45-50 dB according to Hessler.

Id.

James believes that proper actual background sound level measurements are preferable to computer modeling:

> The ability of the model to accurately replicate how the sounds are blocked by terrain or reflected by terrain is especially weak. Errors in models of wind turbine noise propagation located on flat terrain have been shown to have errors of 5 to 10 dB or more when studied by independent acoustical engineers. It would be expected that errors of this magnitude or higher would be found in models of more complex terrain such as is found in the community near WEPCO's footprint.

Id., p. 14. Therefore, "it is a safe assumption to consider the WEPCO models to be estimates of turbine noise under optimum operating conditions and nothing more. id..[2]

[2] Jeffrey Bump expressed similar concerns regarding the testing conducted by WEPCO's expert. Mr. Bump held several positions with Wisconsin Power & Light over a 23-year career. He testified that electric

Kamperman's measurements show that existing conditions at the proposed Glacier Hills site are often below the nighttime 30dBA level deemed safe by the World Health Organization and that: "[o]peration of wind turbines will increase sound levels on a routine basis to 40-45 dBA for many local residents and above that for conditions not accounted for in the models." Ex. 808, p. 19.

2. Scientific evidence proves the need to protect the public from wind turbine noise.

According to James: "Wind turbine noise includes a significant low-frequency component, including inaudible infrasound…. " Ex. 808, p. 10. According to one of WEPCO's own sound experts: "Low frequency noise, the frequency range from about 10Hz to 200Hz, has been recognised as a special environmental noise problem, particularly to sensitive people in their homes." Geoff Leventhall, *Low Frequency Noise and Annoyance*, 6 Noise & Health 23 (2004), ex.809, p. 109. Leventhall bases his opinion on the findings of the World Health Organization.

> The World Health Organization recognizes the special place of low frequency noise as an environmental problem. Its publication on Community Noise (Berglund et al., 2000) makes a number of references to low frequency noise, some of which are as follows
> *"It should be noted that low frequency noise, for example, from ventilation systems can disturb rest and sleep even at low sound levels"*
> *"For noise with a large proportion of low frequency sounds a still lower guideline* (than 30dBA) *is recommended"*
> *"When prominent low frequency components are present, noise measures based on A-weighting are inappropriate"*
> *"Since A-weighting underestimates the sound pressure level of noise with low frequency components, a better assessment of health effects would be to use C-weighting"*

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generation station planners conduct sound tests "at the nearest sensitive receptors -homes, residential neighborhoods, schools, and hospitals." Despite this fact, only one of WEPCO's monitoring points was adjacent to a non-participating residence. " The other 6 monitoring points are located inside clusters of generators, or closer to generators than non-participating homes." Bump Tr., pp. D9.5-6.

> *"It should be noted that a large proportion of low frequency components in a noise may increase considerably the adverse effects on health"*
> *"The evidence on low frequency noise is sufficiently strong to warrant immediate concern.*"

Id.. p. 110 (emphasis in original)

The Minnesota Department Of Health prepared a study entitled *Public Health Impacts of Wind Turbines,* Ex. 800 (the "Minnesota Study"). The study, dated May 22, 2009, is an evaluation of the "health impacts from wind turbine noise and low frequency vibrations." *Id.* p. iv. It reports that: "[c]ase studies have suggested that health can be impacted by relatively low levels of low frequency noise," citing the study of a family reporting: "'indisposition, decrease in performance, sleep disturbance, headache, ear pressure, crawl parasthsy [crawling, tingling or numbness sensation of the skin] or shortness of breath.'" *Id.*., p. 15.

The Minnesota Study goes on to state:

> Low frequency noise, unlike higher frequency noise, can also be accompanied by shaking, vibration and rattling. In addition, throbbing and rumbling may be apparent in some low frequency noise. While these noise features may not be easily characterized, numerous studies have shown that their presence dramatically lowers tolerance for low frequency noise (Bergland et al., 1996).

Id., p. 16

Substantial research has been done on the impacts of wind turbine noise. As discussed in the Minnesota Study, Swedish studies show that almost 25% of people surveyed reported annoyance from wind turbines at noise measurements as low as 35 dB(A). *Id.*., p. 17. Swedish studies also found that noise annoyance from wind turbines was more likely in "areas rated as quiet and in areas where turbines were visible. In one of the studies, 64% of respondents who reported noise annoyance also reported sleep

disturbance. . .." *Id.*.

The Minnesota Study goes on to state: "A number of un-reviewed reports have catalogued complaints of annoyance and some more severe health impacts associated with wind farms." *Id.*, p. 18. "The most common complaint is decreased quality of life, followed by sleep loss and headache." *Id.*. A study in the United Kingdom reported complaints of "palpitations, migraines, tinnitus, anxiety and depression." *Id.*.

Nina Pierpont received an MD from Johns Hopkins, a BA from Yale and a PhD from Princeton. Pierpont has studied what she describes as Wind Turbine Syndrome. The symptoms of Wind turbine Syndrome include:

> 1) Sleep problems: noise or physical sensations of pulsation or pressure make it hard to sleep and cause frequent awakening.
> 2) Headaches, which are increased in frequency or severity.
> 3) Dizziness, unsteadiness, and nausea.
> 4) Exhaustions, anxiety, anger, irritability, and depression.
> 5) Problems with concentration and learning.
> 6) Tinnitus (ringing in the ears).

N. Pierpont, *Health Impacts of Wind Turbine Noise* (2006), ex. 902, p. 1096.

The Minnesota Study discusses Dr. Pierpont's updated 2009 findings, as described in her forthcoming book, *Wind Turbine Syndrome: A Report on a Natural Experiment*.:

> Pierpont (2009) postulates wind turbine syndrome, consisting of a constellation of symptoms including headache, tinnitus, ear pressure, vertigo, nausea, visual blurring, tachycardia, irritability, cognitive problems and panic episodes associated with sensations of internal pulsation. She studied 38 people in 10 families living between 1000 feet and slightly under 1 mile from newer wind turbines. She proposes that the mechanism for these effects is disturbance of balance due to "discordant" stimulation of the vestibular system, along with visceral sensations, sensations of vibration in the chest and other locations in the body, and stimulation of the visual system by moving shadows. Pierpont does report that her study subjects maintain that their problems are caused by noise and vibration, and the most common symptoms reported are sleep disturbances and

headache. However, 16 of the people she studied report symptoms consistent with (but not necessarily caused by) disturbance of equilibrium.

Ex.800, p. 19.

The Minnesota Study drew the following conclusions:

> Wind turbines generate a broad spectrum of low-intensity noise. At typical setback distances higher frequencies are attenuated. In addition, walls and windows of homes attenuate high frequencies, but their effect on low frequencies is limited. Low frequency noise is primarily a problem that may effect some people in their homes, especially at night problem for businesses, public buildings, or for people outdoors.
>
> The most common complaint in various studies of wind turbine effects on people is annoyance or an impact on quality of life. Sleeplessness and headache are the most common health complaints and are highly correlated (but not perfectly correlated) with annoyance complaints. Complaints are more likely when turbines are visible or when shadow flicker occurs. Most available evidence suggests that reported health effects are related to audible low frequency noise. Complaints appear to rise with increasing outside noise levels above 35 dB (A). It has been hypothesized that direct activation of the vestibular and autonomic nervous system may be responsible for less common complaints, but evidence is scant.
>
> The Minnesota nighttime standard of 50 dB (A) not to be exceeded more than 50% of the time in a given hour, appears to underweight penetration of low frequency noise into dwellings. Different schemes for evaluating low frequency noise, and/or lower noise standards, have been developed in a number of countries.
>
> For some projects, wind velocity for a wind turbine project is measured at 10 m and then modeled to the height of the rotor. These models may under-predict wind speed that will be encountered when the turbine is erected. Higher wind speed will result in noise exceeding model predictions.
>
> Low frequency noise from a wind turbine is generally not easily perceived beyond 1/2mile. However, if a turbine is subject to aerodynamic modulation because of shear caused by terrain (mountains, trees, buildings) or different wind conditions through the rotor plane, turbine noise may be heard at greater distances.

Ex. 800, p. 25.

The Minnesota Study is the most up-to-date survey of the research on the public

health impacts of wind turbine noise. It was not available to the Commission when the Commission considered previous applications for wind electric generation facilities. Based on this new information, the Commission should conclude that the Glacier Hills project poses a threat to human health and safety and deny WEPCO's application to construct the facility.

II. WIND TURBINES CAUSE SHADOW FLICKER, WHICH THREATENS HEALTH AND SAFETY.

According to the FEIS:

> As wind turbine blades rotate, they cast a shadow upon the ground and objects below. A strobe effect can occur where the shadow of the rotating blades cause rapid changes in the light intensity in the area of the shadow. Shadow flicker occurs when rotating wind turbine blades cast shadows on a sensitive receptor. receptor, such as the windows of residences.

FEIS, p. 55. Even when winds are low, the blades continue to rotate and cast shadows. *Id*. According to the Minnesota Study:

> a receptor 300 meters perpendicular to, and in the shadow of the blades of a wind turbine, can be in the flicker shadow of the rotating blade for almost 11/2 hour a day. At this distance a blade may completely obscure the sun each time it passes between the receptor and the sun.

Ex. 800, p. 14.

Ex. 804 -the video and audio recording taken by Forward Wind Energy Center resident Larry Wunsch- vividly demonstrates the intensity and reach of shadow flicker. According to Mr. Wunsch, shadow flicker can last three weeks, two times per year, for as long as two hours at a time. Wunsch Tr., p. D9.14.[3] Lawrence Lamont has turbines on all four sides of his home, and experiences shadow flicker "all the time . . .." Tr., p. 291.

[3] Mr. Wunsch's testimony was not the first time he recounted his experience living within a wind generation facility. One year after the Forward Wind Energy Center went online, Mr. Wunsch complained to the Commission (in the Forward docket) that the shadow flicker was anything but "minimal," as had been promised by the developer. PSC REF# : 106318

Blue Sky Green Field Wind Park. Ex. 807

Joan Lagerman lives inside the Blue Sky Green Field Wind Park. According to Ms. Lagerman, the shadow flicker:

> BATHES THE EAST SIDE OF THE HOUSE AT DAWN SENDING ITS FLICKER THROUGHOUT THE HOUSE IT COMES DOWN A STAIRWELL HITS A WALL AT THE BOTTOM AND RADIATES INTO [HER] KITCHEN. IT LTERALLY BOUNCES OFF THE WALLS.

Ex. 902, p. 52. When she is gardening, "ITS LIKE WORKING IN A DISCO WITH THE STROBE BALL SPINNING." *Id.* David Olsen suffers from epilepsy. After looking at a 300-foot turbine in Montfort, Wisconsin, Mr. Olsen experienced "an aura of an epileptic seizure." Ex. 902, p. 13.

The FEIS, p. 62, states that homeowners can "implement reasonable and appropriate" measures to mitigate the effects of shadow flicker, such as " room-darkening shades or blinds in the windows." As Larry Slager testified, however:

> Well, they'll put blinds in your homes and window shades. Well, how many of you want to live in a cave; and besides that, in the wintertime, I don't know about you, but I like to have my drapes and blinds open because I don't care if it's 20

> below out, if I have that sun shining in, that's heating my house, my furnace doesn't run very much. So I'm saving energy there.

Tr. p. 265. Joan Lagerman stated:

> WE ENERGIES HAD BLINDS PLACED IN ALL OF OUR WINDOWS, NOW WE HAVE TO OPEN AND CLOSE, OPEN AND CLOSE. IF WE JUST LEAVE THEM CLOSED ITS LIKE LIVING IN A CAVE.

Ex. 902, p. 52.

According to the FEIS, p. 62, shadow flicker may "cause health concerns for project area residents." Joan Lagerman gets headaches and becomes sick to her stomach living inside the Blue Sky Green Field Wind Park. Ex. 902, p. 52. Melissa Smedema , a township of Randolph resident, testified:

> I know for a fact, that my health will be extremely negatively impacted by the shadow flicker and vibratory noise from the turbines. I have had Menieres Disease for 18+ years. This disease is greatly triggered by movement, light, and pressure, all of which will be a constant with the turbines. I am very scared to have to live a quality of life that I know form previous experience, is life altering.

Ex. 902, p. 448. Jeff Bump has an equilibrium problem "which causes nausea and dizziness." Driving through existing wind electric generation facilities has caused him to feel queasy and dizzy. Bump Tr. D9.7:17.

No less than wind turbine noise, shadow flicker is a threat to health and safety sufficient to warrant denying the WEPCO application to construct Glacier Hills.

III. WIND TURBINES PRESENT OTHER THREATS TO HEALTH AND SAFETY.

Noise and shadow flicker are only the most serious threats to health and safety. Wind turbines can also collapse, and turbine blades can break loose from their hubs. FEIS, p. 62. In addition, "rime ice" or "glare ice" can form on a turbine, producing "ice throws." *Id.* p. 63. A turbine operating manual from May, 2009, warns the company's

workers to stay within a radius of 1300 feet of a turbine in the event of (in the words of WEPCO's counsel) "specific wind turbine malfunctions or abnormal operating conditions including a runaway turbine or fire." Tr. 142:15-17.

Some residents are fearful that medical helicopters may not be able to fly into and land in a wind electric generation project. E.g., Slager Tr. 264:16. The concern is a reasonable one. Ray Slavik is a retired EMS helicopter pilot. He was asked in an interview if a helicopter pilot would be able to land near a large wind turbine, even if the blades were not turning. He replied: "Don't kid. yourself, they will most likely not land anywhere in the County where these turbines are located . . .." Ex. 902, p. 149.

The FEIS, p. 68, recognizes:

> Turbines can limit potential landing sites for the helicopters, both because of the physical presence of the turbines and the dangers related to flying through the disturbed air (wake turbulence) extending away from an operating turbine.
> …
> The reduction in potential landing areas within the project area could result in persons needing to endure additional (or longer) ambulance rides to reach the helicopter, which in turn increases the overall travel time to the hospital. Generally, the quicker a patient reaches a hospital for treatment, the better the chance that the patient will survive.

The FEIS goes on to state: "There do not appear to be any UW Med Flight rules or policies that would preclude landing within the wind project area if it is safe to do so." *Id.* This may be no comfort to residents of Glacier Hills, since:

> [t]he decision about where to land is the pilot's and is based on a variety of site factors that present themselves upon arrival at an emergency scene. For example, closer landings to a turbine might be possible if the winds are calm and the wind turbine rotors are not rotating.

Id. The FEIS states: " UW Med Flight and the other responding agencies plan to develop safe landing sites or locations within the project area to which medical helicopters could be dispatched." *Id.* Unfortunately, there is no evidence that there has been any planning

and no assurance that "safe landing sites or locations" are being, or ever will be developed.

IV. WIND ELECTRIC GENERATION FACILITIES UNFAIRLY REDUCE PROPERTY VALUES.

Larry Wunsch, who lives inside the Forward Wind Energy Center, has been unable to sell his property. Wunsch Tr. D9.14:17. Kevin Gehring, who lives inside the Butler Ridge project, testified: "I have 150 acres, and I talked to three people that buy land in that township, they will not touch anything in the Town of Herman …." Gehring Tr. 262:9-11.

A Home for Sale in the Forward Wind Energy Center. Ex. 807

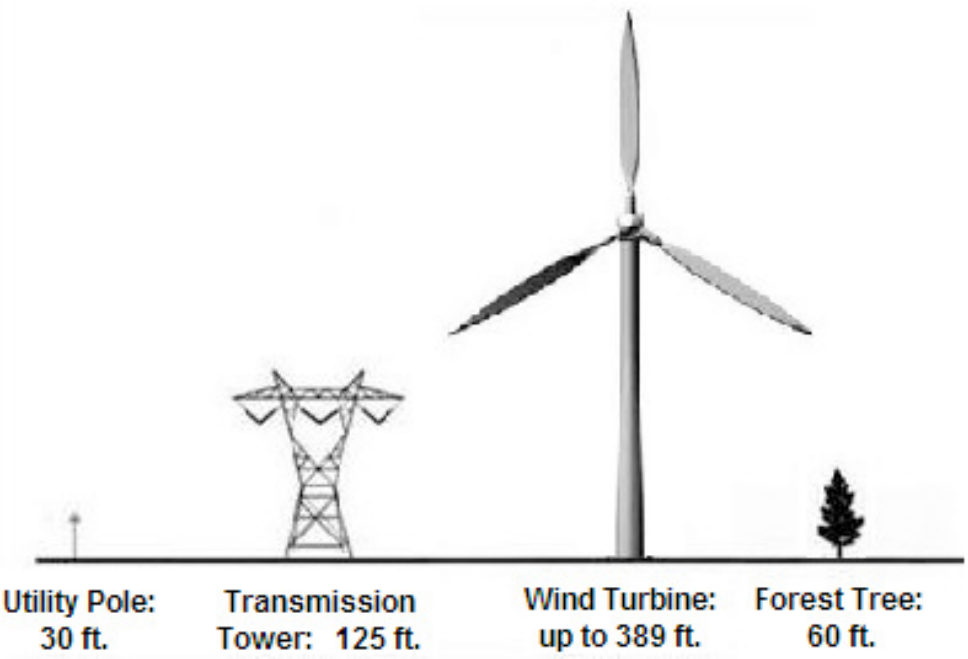
Jeff Bump --who would live "in the center" of four Glacier Hills wind turbines-- is concerned about the value of his property. Bump Tr. D9.5:1. Gary Steinich is a farmer in Friesland. He granted an easement for the placement of a turbine, but has become concerned enough about the value of his property that he is considering trying to revoke the easement. Steinich Tr. D9.2:10-12.

Kurt C. Kielisch is a certified forensic appraiser, and the principal author of *Wind Turbine Impact Study - Dodge & Fond du Lac Counties- Wisconsin*., Ex. 302. The study consists of three parts: a literature study, an opinion survey, and sales studies. The study evaluated the impact of the Forward Wind Energy Center, the Blue Sky Green Field Wind Energy Center, and the Cedar Ridge Wind Farm on property values.[4]

In all but two scenarios, 60% of real estate professionals surveyed stated that the presence of wind turbines had a negative impact on property values. Ex. 303, p. 5

Photograph shown to survey participants. Ex. 303, p. 13

[4] Only the Forward and Blue Sky Green Field facilities were included in the sales study. Ex. 303, p. 13.



Drawing shown to survey participants. ***Id.***

The sales studies indicated that:

> (1) sales within the wind turbine influence area sold for less than those outside of this area;
>
> (2) there were substantially fewer sales available within the turbine influence area as compared to those sales outside of the influence area; and
>
> (3) the impact of the wind turbines decreased the land values from -19% to -74%, in the case of Blue Sky Green Field, and from -12% to -47% in the case of Forward.

Ex. 303, p. 36.

> According to the FEIS, p. XVII:
>
> The large size and high-tech appearance of the wind turbines causes them to stand out against the backdrop of open, rural landscapes. Because of their approximate 400-foot height, they would be seen for long distances. Residents who live in close proximity to one or more turbines may perceive the turbines as an intrusion on the rural landscape. . . . [L]andowners . . . may feel a loss of control over their visual environment and a sense of helplessness to restore their former familiar surroundings.

The *Wind Turbine Impact Study* is unlikely to boost residents' morale.

V. CONCLUSION

The Glacier Hills Wind Park would threaten human health and safety and substantially and unfairly reduce property values. For these reasons, the Commission may not find that the project is in the public interest and, therefore, must deny WEPCO's application for a CPCN.

November 24, 2009

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